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March 29, 1984

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U.S. Nuclear Regulatory Commission
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Attn: Mr. Roger Walker

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D/RA		DE	
A/RA		DRMSP	
RC		DRMA	
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Subject: LaSalle Station Butt Splice Inspection

Attached is a report outlining LaSalle Stations actions taken in response to recent allegations made to the NRC. An informational LER will follow in the near future.

If any additional information is required, please contact Mr. J.W. Giesecker on extension 549.

G.J. Diederich

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Station Superintendent

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DVR 1-1-84-108

I. EVENT DESCRIPTION:

An allegation made to the Nuclear Regulatory Commission pertaining to the use of an incorrect splicing technique resulted in the inspection of butt splices used to extend control/instrumentation conductors (usually #14AWG). Initial inspection of the Unit 1 safety related Switchgear and Motor Control Center panels identified 110 butt splices. Of the 110 identified butt splices, sixteen (16) were rejected. Based on these results, the inspection was expanded to include the remaining safety related Panels, Penetrations (containing control cables), Switchgear and MCC's in Units 1 and 2. The results are tabulated in Attachment A.

A separate, but related allegation was made on an improper technique used to remove the outer jacketing from multiconductor cable which could result in nicking/cutting of the individual conductors insulation.

II. CAUSE:

The apparent cause in both of the above allegations was the failure of the particular terminator to follow the Electrical Contractors termination procedure WI500 (specifically paragraphs 3.2.6 and 3.2.12) and good work practices commensurate with the Journeyman Electrician trade classification. In addition, a minor procedural deficiency aided incorrect butt splices not being identified by contractor Quality Control in that the installer was not specifically required to inform QC when a butt splice was installed to extend a conductor nor was QC specifically required to inspect this type of installation.

III. PROBABLE CONSEQUENCES OF THE OCCURENCE:

An evaluation of the safety significance was performed for each of the conductors that failed the pull test during this inspection. As detailed in Attachments B and C, the potential loss of 58 conductors was evaluated, 33 in Unit 1 and 25 in Unit 2. No safety impact would have resulted from failure of 48 of the conductors and 9 additional conductors could have failed with only minimal impact. Loss of the remaining conductor, 1RH256, would have prevented valve 1E12-F042C from opening and initiation of LPCI "C". The health and safety of the public was not affected due to the remote possibility of this failure occurring and the availability of other ECCS systems.

IV. CORRECTIVE ACTIONS:

The safety related Panels, Penetrations, Switchgear and MCC's in Units 1 and 2 were inspected for the installation of butt splices on control and instrumentation cables. Except as indicated below, all of the butt splices identified were visually inspected to the following criteria:

1. PIDG window splice was sized correctly for the wire spliced.
2. Crimp shape and "dots" indicate correct crimping tool was used i.e. not pliers - see note below.

3. Conductor insulation was under the nylon insulation of the splice - see note below.
4. End of the conductor was flush with or extended beyond end of terminal wire barrel.
5. Butt splice was covered with Okonite taping sequence in the Containment, Reactor Bldg. or Steam Tunnel.
6. Any nicks or cuts identified in the conductor insulation were repaired.

NOTE: During this inspection it was determined that the Electrical Contractor used a calibrated crimping tool sized for #16 - #22 AWG connectors to crimp the PIDG window splices on #14 AWG conductors and that the insulation thickness of #14 Okonite conductors will not fit under the insulation barrel of the splice preventing the insulation crimp from gripping the conductor insulation. Review of these items by the splice manufacturer and CECO Engineering indicates that the splices as installed will meet their design function - for details see Discrepancy Report 1-84-132.

Repair packages were initiated and completed for all butt splices which either failed a pull (tug) test or the required visual inspection criteria. It should be noted, however, that the visual inspection criteria was upgraded after the inspection the Unit I safety related Switchgear and Motor Control Centers and seven (7) of the Unit 1 containment penetrations. This upgrade was the result of a concern that the pull (tug) test might disable a control circuit. A work request has been written to reinspect the 94 (110-16) Switchgear and MCC butt splices and the 11 containment penetration butt splices identified during the first stage of the inspection to the upgraded visual inspection criteria. (All of these 105 butt splices were acceptably pull tested during the initial inspection and are therefore not a concern for continued operation). Any splice found that does not meet this criteria will be replaced.

To resolve the nick/cut insulation allegation, Project Construction performed an inspection on certain panels as indicated in Attachment D "Special Inspection Procedure to Ascertain Cable or Conductor Damage Due to Misapplication of Craft Tools." The results are tabulated in Attachment E and any required repairs completed per Work Requests L33996,7. CECO Station Nuclear Engineering Department has reviewed the repair procedures for the nicked/cut conductors and has determined that the repair method restores the insulation system to its full 600v. level. During a meeting with the NRC on 3/7/84, SNED committed to further confirm one aspect of the repair procedure by actual test. An environmental test is to be performed on the Okonite taping sequence applied over a nick/cut at the point where the cables outer jacket has been removed. Discrepancy Report 1-84-113 has been written to track this item.

To help prevent further problems in this area, AIR 1-84-67051 has been written to upgrade Electrical Maintenance and Contractor procedures to better define craft and QC responsibilities in these areas.

V. PREVIOUS OCCURRENCES:

None.

VI. PREPARER:

J. W. Gieseke, Ext. 549.

ATTACHMENT A

SUMMARY OF BUTT SPLICE INSPECTIONS

	NUMBER OF ITEMS INSPECTED	NUMBER OF SPLICES INSPECTED	FAILED VISUAL INSP.	FAILED PULL TEST	SPLICES REPLACED	COMPLETED
<u>UNIT 0,1</u>						
1. Switchgear & MCC's	19	110**	16	16*	16	3/11/84
2. Penetrations	7	11***	0	0	0	3/11/84
3. Penetrations	11	0	0	0	0	3/16/84
4. Control Panels	151	641	174	17	174	3/18/84
<u>UNIT 2</u>						
1. Switchgear & MCC's	18	102	54	3	54	3/18/84
2. Penetrations	20	0	0	0	0	3/19/84
3. Control Panels	90	424	86	22	86	3/20/84

*5 were not pull tested because they failed the initial visual inspection criteria.

** 94 require additional visual inspection to the upgraded inspection criteria.

*** 11 require additional visual inspection to the upgraded inspection criteria.

ATTACHMENT B

CABLE SPLICES
PULL TEST FAILURE EVALUATION
UNIT ONE

	<u>CABLE NUMBER</u>	<u>WIRE COLOR</u>	<u>SEGREGATION CODE</u>
1.	1CM329	drain (shield cable)	1BK
2.	1HG020	drain (shield cable)	1BK
3.	1HP156	orange	1GC
4.	1PR137	White	1BK
5.	1PR210	Orange	1BK
6.	1RH124	Black	1BC
7.	1RH156	White	1BC
8.	1RH256	Black	1BC
9.	1RI033	White	1YC
10.	1RI184	Green	1YC
11.	1RP066	Black	B2C
12.	1RP066	White	B2C
13.	1RR288	Red	1BC
14.	1RR389	Red	1BC
15.	1VC099	White	1BC
16.	1LC189	White	1YC
17.	1LC189	Black	1YC
18.	1DO036	Black	1YC
19.	1NB421	Orange	1YC
20.	1VQ152	White	1YC
21.	1RR035	Red/Black	12C
22.	1RR035	Green/Black	12C
23.	1RH237	Red/Black	1BC
24.	1VE015	Black	1BC
25.	1VE015	Red	1BC
26.	1DO044	White	1YC
27.	1AP251	Black	1BC
28.	1VP019	Blue	12C
29.	1VE015	Orange	1BC
30.	1VE015	White	1BC
31.	1DG013	White/Black	1BC
32.	1CM016	drain (shield cable)	1BK
33.	Pnl, 1H22-P026	Term: NN-1 to AV-1C	B2C

Cable Number: 1CM329
 Wire Color: drain
 Function: Shielded cable, cable shield to ground.
 Safety Impact: No impact.

Cable Number: 1HG020
 Wire Color: drain
 Function: Shielded Cable, shield
 Safety Impact: No Safety Impact

Cable Number: 1HP156
 Wire Color: Orange
 Function: 1HP156, Orange, is the Control Room Closing Control leg for system Aux. transformer to bus 143 normal feed. ACB 1432. With the loss of 1HP156, orange. ACB 1432 can still be closed at PNL 1E22-P301B.
 Safety Impact: No safety impact. Bkr will trip if required, and D/G will pick up bus.

Cable No: 1PR137.
 Wire Color: White
 Function: 1PR137, orange, is the -15VAC power supply from the trip/aux unit, 1D18-K751C, to the Detector Assy. 1D18-N451C, (Control Room ventilation radiation monitor.) A break in 1PR137, orange, will de-energize the pre-amp, causing the monitoring unit to drive down scale. This will cause the Green "Operating" light to go out on Pnl OPM14J, and bring up the "Control Room HVAC Rad Monitoring PNL trouble" alarm at PNL 1PM13J.
 Safety Impact: No safety impact 1) failure is in conservative direction. 2) VC logic is 1 of 2 twice so no action occurs except alarm.

Cable No: 1PR210
 Wire Color: Orange
 Function: 1PR210, orange, is the high range signal connection between the RM-80, micro-processor unit, and the RM-23, Remote Control and display device, for Standby Gas Treatment Vent W.R.G.M. A break in 1PR210, orange, will cause the "High Range" backlit selector button, of the RM-23 Unit, to flash. Per LOP-PR-04 the operator would then perform a channel check, which would point out the problem. Also a break in 1PR210, orange, would not affect the input to the Process Comp.
 Safety Impact: No safety impact: Low range readings still available. Old SBTG Monitors still available.

Cable No: 1RH124
 Wire Color: Black
 Function: 1RH124, Blk, is a wire connection in "Norm" leg of the "Open" control circuit of the RHR Containment Spray Outboard Valve, 1E12-F016B. 1E12-F016B has two control locations one from the Control Room (Norm) and one from the Remote shutdown panel (Emer.) A break in 1RH124, blk, will disable "OPEN" Control of 1E12-F016B from the Control Room. The Valve can still be opened from the remote shutdown panel.

Safety Impact: Minimal impact: valve could still be operated from Rem S/D panel. Not required to auto open during accident.

Cable No.: 1RH156
 Wire Color: White
 Function: 1RH156, White, is a wiring connection for the over-load bypass of RHR injection valve, 1E12-F042B. ('B' LPCI injection) A break in the 1RH156, White, will disable the overload bypass function.

Safety Impact: Minimal impact: Valve has been tested to cycle with Thermal O/L protection in place.

Cable No.: 1RH256
 Wire Color: Black
 Function: 1RH256, black, is a wiring connection in the Rx low pressure permissive circuit to OPEN RHR injection Valve, 1E12-F042C. A break in 1RH256, black, would prevent both automatic and manual (handswitch) opening of 1E12-F042C, as well as disabling the 1E12-F042C OL by pass circuit.

Safety Impact: Because of the pull test failure of this wire, it is believed that under certain seismic conditions, this wire could have pulled loose, preventing valve 1E12-F042C from opening and initiation of LPCI "C". The chance of this occurring is possible, but remote. Further more this would have been isolated to the 1E12-F042C valve and all other ECCS systems would remain available.

Cable No.: 1RI033
 Wire Color: White
 Function: 1RI033, white, is a wire connection in the "Norm" leg of the "OPEN" Control Circuit of the RCIC Pump Suction from condensate storage tank valve, 1E51-F010. Note: 1E51-F010 has two control locations. One from the Control Room (Norm) and one from the remote shutdown Panel (EMER). A break in 1RI033, white, will prevent opening 1E51-F010 from the control room. The valve can still be opened from the remote shutdown panel.

Safety Impact: No safety impact: Valve is normally open, and can be closed if needed to shift suction to Supp. Pool.

Cable No.: 1RI184
 Wire Color: Green
 Function: 1RI184, green, is a wire connection for "Closed" light indication in the Control Room for outboard steam line isolation valve, 1E51-F008.

A break in 1RI184, green, would prevent the "CLOSED" indication light for 1E51-F008, from lighting on the Control Room Panel.

Safety Impact: No safety impact, indication only.

Cable No.: 1RP066
 Wire Color: Black
 Function: 1RP066, black, is a wire connection in the Primary Containment High Pressure Trip circuit. A break in 1RP066, Black, would give a primary containment high pressure trip alarm. This would result in a possible scram and possible group II & III and outboard isolation logic initiating if any other relays associated with isolation logic are deenergized.

Safety Impact: Minimal Impact: 1.) Fails to trip logic systems. 2.) Logic strings are 1 of 2 twice, so no actions occur, only alarms.

Cable No.: 1RP066
 Wire Color: White
 Function: 1RP066, White, is a wire connection in the primary containment high pressure trip circuit. A break in 1RP066, white, would give a primary containment high pressure trip alarm. This would result in a possible Scram and possible Group II & III and outboard isolation logic initiating, if any other relay associated with isolation logic are deenergized.

Safety Impact: Minimal Impact: See evaluation for 1RP066, Black.

Cable No.: 1RR288
 Wire Color: Red
 Function: This red wire of 1RR288 is connected to the trip circuit of 6.9KV Brk 3B of Swgr 152.

The failure of this wire would prevent the trip of the RR pump 3B breaker from either a Turbine Stop Valve fast closure or Turbine Stop Valve < 90% open.

Safety Impact: No Safety Impact: Pump would still trip via the 4 Bkr. In addition 3 Bkr would trip due to RR Downshift Logic.

Cable No.: 1RR389
Wire Color: Red
Function: This red wire of 1RR389 is connected to the Turbine Stop valve fast closure Trip circuit of the 6.9 KV RR pump Breakers 4A and 3B.
The failure of this wire would disable the above mentioned trip however an alternate trip is present from the Turbine Stop Valve < 90% open logic that would provide the same function in the event of a turbine Stop Valve fast closure.
Safety Impact: No Safety Impact: TSV fast closure will still cause trip through Trip System A. Bkr will also trip due to TSV 90% Lim. Sw. Not required until EO Cycle.

Cable No.: 1VC099
Wire Color: White
Function: 1VC099 White is a wire connected to the fire detection alarm circuit for the control room Emergency make up filter OVC015A.
This contact is associated with an interlock relay in such a manner if the white wire of 1VC099 were to "open" the fire protection deluge valves for OVC015A would be prevented from opening.
Safety Impact: Minimal Safety Impact: VC Emergency M/U train is a habitability concern, not a safety concern. Train is not normally used.

Cable No.: 1LC189
Wire Color: White
Function: The white wire of cable 1LC189 is the thermal overload bypass of MSIV Leakage Control Inboard Isolation valve 1E32-F003E. Failure of this wire would prevent the thermal overload circuit from functioning.
Safety Impact: None, this valve has been tested to cycle as required with the thermal overload in the circuit.

Cable No.: 1LC189
Wire Color: Black
Function: The white wire of cable 1LC189 is the thermal overload bypass of MSIV Leakage Control Inboard Isolation valve 1E32-F003E. Failure of this wire would prevent the thermal overload circuit from functioning.
Safety Impact: None, this valve has been tested to cycle as required with the thermal overload in the circuit.

Cable No.: 1D0036
Wire Color: Black
Function: The Black wire of 1D0036 is part of the annunciator circuit for the loss of power to DG-0 Fuel Oil Transfer Pump OD001P. The failure of this wire would prevent the annunciator from actuating a loss of power at 135Y-2 Compt. F3.
Safety Impact: None, this pump has an auto transfer to unit 2 power on the loss of Unit 1 power.

Cable No.: 1NB421
Wire Color: Orange
Function: The orange wire of 1NB421 is part of the open circuit for Main Steam Line Drain Valve 1B21-F067D (outboard). The failure of this wire would prevent the opening of the drain valves.
Safety Impact: None, the valve will still function as required on a containment isolation and line drain can be accomplished via the inboard drain line.

Cable No.: 1VQ152
Wire Color: White
Function: The white wire of 1VQ152 is part of the overload bypass circuit of D.W. vent/purge inlet valve 1VQ029. Failure of this wire would prevent the thermal overload for this valve from functioning.
Safety Impact: None, this valve has been tested to cycle as required with the overload protection in the circuit.

Cable No.: 1RR035
Wire Color: Red/Black
Function: The Red/Black wire of cable 1RR035 is part of the closing coil circuit of Recirc Pump Suction Valve 1B33-F023B. Failure of this wire would prevent closing the valve from panel 1H13-P602.
Safety Impact: None, the valve is normally lined up "open" and is not required for any Containment Isolation.

Cable No.: 1RR035
Wire Color: Green/Black
Function: The Green/Black wire of cable 1RR035 is part of the light, open, and close circuits for Recirc Pump Suction Valve 1B33-F023B. Failure of this valve would cause loss of indication, and the inability to open and close the valve from panel 1H13-P602.
Safety Impact: None, the valve is normally lined up "open" and is not required for any Containment Isolation.

Cable No.: 1RH237
 Wire Color: Red/Black
 Function: The Red/Black wire of cable 1RH237 is part of the close circuit of RHR Heat Exchanger Shell Side Bypass Valve 1E12-F048B. Failure of this wire would prevent the valve from being closed from 1C61-P001 and 1H13-P601.
 Safety Impact: None, the valve will still function as required to auto open on initiation. The parallel flow path has been proven to be an acceptable means of System operation in the event the RHR Heat Exchanger is required to be placed in service.

Cable No.: 1VE015
 Wire Color: Black
 Function: Connection for indication lights and part of trip circuit for OVE03CA (same as orange & white of 1VE015)
 Failure will result in the following:
 1) Lose indication at local panel OPA09J for OVE03CA
 2) Lose manual remote trip from handswitch for OVE03CA
 3) Lose trip of OVE03CA on no supply air flow with OVE01CA running.
 Safety Impact: Minimal impact: only trip function & indication effected.

Cable No.: 1VE015
 Wire Color: Red
 Function: Wire to trip coil for OVE03CA failure will result in the loss of all remote trip functions for OVE03CA.
 Safety Impact: Minimal impact: only trip function & indication effected.

Cable No.: 1DO044
 Wire Color: White
 Function: Cable 1DO044 is the wire connection of U1 control power to the QDG fuel oil transfer pump discharge valve ODOO04. A break in 1DO044, white, would eliminate the automatic transfer of U2 control power to the valve along with loss of U1 control power.
 Safety Impact: Minimal Impact: Power would have to be transferred manually when O D/G day tank low level Alarm occurred.

Cable No.: 1AP251
 Wire Color: Black
 Function: Cable 1AP251, black, is the common power connection for the positive indicator lamps of the "Bus 136X 480v breaker. A break in 1AP251, black, would eliminate power to position lamp resulting in loss of breaker position indication.
 Safety Impact: No safety impact, indication only.

Cable No.: 1VP019
 Wire Color: Blue
 Function: Cable 1VP019, blue, controls the trip lamp of the PC 1A vent supply fan. A break in 1VP019, blue, would eliminate trip indication.
 Safety Impact: No safety impact, indication only.

Cable No.: 1VE015
 Wire Color: Orange
 Function: Is a wire for closing circuit of 480v swgr 136x Comp. 303C A.E.E.R. Air Cooled Cond. Fan 9A EPN OVE03CA. Failure 2 would prevent closing the breaker remotely.
 Safety Impact: No safety impact breaker could still be closed locally.

Cable No.: 1VE015
 Wire Color: White
 Function: Is a wire for the closing circuit of the breaker for OVE03CA - same as orange of 1VE015 cable above. Failure would prevent closing the breaker remotely.
 Safety Impact: No safety impact breaker could still be closed locally.

Cable No.: 1DG013
 Wire Color: White/Black
 Function: One of two wires to closing circuit of 136X Comp. 303A, 1A DG Cooling Water Pump "Auto start circuit". Failure causes the auto start capability of cooling water pump to be lost.
 Safety Impact: None, Pump can be manually started with the control switch through the other wire.

Cable No.: 1CM016
 Wire Color: drain (shield cable)
 Function: Shielded cable, shield.
 Safety Impact: None.

Panel No.: 1H22-P026
 Terminals: NN-1 to AV-1C
 Function: Same as 1RP066, Black.
 Safety Impact: Minimal Impact: 1.) Fails to trip logic system. 2.) Logic strings are 1 of 2 twice, so no actions occur, only alarms.

ATTACHMENT C

CABLE SPLICES
PULL TEST FAILURE EVALUATION
UNIT TWO

	<u>CABLE NUMBER</u>	<u>WIRE COLOR</u>	<u>SEGREGATION CODE</u>
1.	2DC053	Red	21C NSR
2.	2DO047	Orange	Spare
3.	2NBD31	White/Black	2YC
4.	2NBD31	Green	2YC
5.	2NBD32	Blue/Black	2YC
6.	2NBD33	Green	2YC
7.	2NBD33	Blue	2YC
8.	2NBD33	White/Black	2YC
9.	2NBD33	Orange	2YC
10.	2NBD33	Black	2YC
11.	2NBD33	Red	2YC
12.	2R1236	Black	21C NSR
13.	2CM221	Blue	2BC
14.	2AP246	Green	2BC
15.	2CM168	White	A2K
16.	2CM132	Black	A2K
17.	2CM152	White	A2K
18.	2CM136	White	A1K
19.	2VC110	White	2BK
20.	2DC055	Red	22C
21.	2DC042	Orange	2GC
22.	2CO079	Red	2WC
23.	2CO079	Red/White	2WC
24.	Pnl:2PLF6J	Term: GH-1 to TB2 CM 2 DTE8	
25.	Pnl:2E22-P301	Term: TB7-51 to TB11-38	

Cable No.: 2DC053
 Wire Color: Red
 Function: The red wire of 2DC053 is connected to the 125VDC Batt 2A Ground detector Alarm circuit. A failure of this wire will remove the +65V power supply from the annunciator input card for R-Point R0197 125VDC Batt 2A Ground detector alarm.
 Safety Impact: No Safety Significance: Alarm only, and failure will cause alarm.

Cable No.: 2DC047
 Wire Color: Orange
 Function: Cable not used.
 Safety Impact: No Safety Significance.

Cable No.: 2NBD31
 Wire Color: White/Black
 Function: 2NBD31, White/Black, is a wire connection in the open position indication and startrec computer point circuit for SRV 2B21-F013E.
 A Break in 2NBD31, White/Black, would prevent the "OPEN" indicating light for 2B21-F013E from lighting. Also it would disable Startrec computer point #197, "Monitor Relief Vlv. E position".
 Safety Impact: No Safety Impact: Doesa't affect valve function or alarms. Redundant open indication is available in the Control Room.

Cable No.: 2NBD31
 Wire Color: Green
 Function: 2NBD31, Green, is a wire connection in the "OPEN" position indication and Startrec computer point circuit for ADS Valve 2B21-F013D.
 A Break in 2NBD31, Green, would prevent the "OPEN" indicating light for 2B21-F013D from lighting. Also it would disable Startrec signal No. 196, "Monitor Relief Vlv "D" position".
 Safety Impact: No Safety Impact: See previous evaluation of 2NBD31 White/Black.

Cable No.: 2NBD32
 Wire Color: Blue/Black
 Function: 2NBD32, Blue/Black, is a wire connection in the "OPEN" position indication circuit for SRV 2B21-F013K.
 A break in 2NBD32, Blue/Black, would prevent the "OPEN" indicating light for 2B21-F013K, from lighting.
 Safety Impact: No Safety Impact: See evaluation of 2NBD33 Green.

Cable No.: 2NBD33
 Wire Color: Green
 Function: 2NBD33, Green, is a wiring connection for 125 VDC power to the following:

- Open/Close indication for SRV 2B21-F013M
- Startrec Comp. point #204
- Rly K30, Annun. & Process computer point #ID2317

A break in 2NBD33, Green, would lose Control Room indication for 2B21-F013M. Also it would disable the Startrec point and bring up "2B21-F013M Fully Open" Alarm (and computer point) on pnl 2PA03J.

Safety Impact: No Safety Impact: Valve would still function as designed. Alarm would identify failure. One valid open/not open indication would still exist in the Control Room.

Cable No.: 2NBD33
 Wire Color: Blue
 Function: 2NBD33, Blue, is a wiring connection for SRV 2B21-F013M closed indication, Startrec point #204 and annunciator (Rly K20).

A break in 2NBD33, Blue, would deenergize closed indication in the Control Room, disable Startrec point #204, and bring up "2B21-F013M Fully OPEN" Alarm (and computer point) on Pnl 2PA03J.

Safety Impact: No Safety Impact: See previous evaluation of 2NBD33 Green.

Cable No.: 2NBD33
 Wire Color: White/Black
 Function: 2NBD33, White/Black is a wiring for power to SRV 2B21-F013N closed/open indication, Startrec point #205 and Control Room Annunciator (Relay K31).

A break in 2NBD33, White/Black would lose Control Room indication for 2B21-F013N. Also it would disable Startrec point #205 and bring up "2B21-F013N Fully OPEN" Alarm (and computer point) on Pnl 2PA03J.

Safety Impact: No Safety Impact: See previous evaluation of 2NBD33, Green.

Cable No.: 2NBD33
 Wire Color: Orange
 Function: 2NBD33, orange, is a wiring connection for SRV 2B21-F013M "OPEN" indication and Startrec point #204.

A break in 2NBD33, orange, would disable the "OPEN" indicating light and Startrec point #204.

Safety Impact: No Safety Impact: See previous evaluation of cable 2NBD31, White/Black.

Cable No.: 2NBD33
 Wire Color: Black
 Function: 2NBD33, Black, is a wiring connection for power to the Open and Close indication for SRV 2B21-F013L, Startrec point #203, and 2B21-F013L open alarm and computer point. A break in 2NBD33, Black, would disable the Open and Closed indicating lights for 2B21-F013L. Also it would disable Startrec point #203 and bring up "2B21-F013L fully Open" Alarm (and computer point) on pnl 2PA03J.
 Safety Impact: No Safety Impact: See previous evaluation of cable 2NBD33, Green.

Cable No.: 2NBD33
 Wire Color: Red
 Function: 2NBD33, Red, is a wiring connection for SRV 2B21-F013L "Closed" indication and Startrec point #203, also Rly K29, alarm & computer point. A break in 2NBD33, Red, would disable the closed indicating light for 2B21-F013L and Startrec point #203. It would also bring up "2B21-F013L Fully Open" alarm (and computer point) on pnl 2PA03J.
 Safety Impact: No Safety Impact: See previous evaluation of 2NBD33, Green.

Cable No.: 2RI236
 Wire Color: Black
 Function: The black wire of 2RI236 is connected to the position indication circuit for the RCIC Governor valve. If this wire should fail, proper valve position indication would be maintained, but the digital computer point for Governor valve closed would be lost.
 Safety Impact: No Safety Impact: Computer input only.

Cable No.: 2CM221
 Wire Color: Blue
 Function: The blue wire of 2CM221 is part of the Div. 2 inboard isolation logic to sample pump 2CM03PB. If this wire should fail it would simulate a Div. 2 inboard isolation to pump 2CM03PB resulting in the inability to start this pump.
 Safety Impact: No Safety Impact: Sample pump is non-safety related, and is tripped and isolated during an accident.

Cable No.: 2AP246
Wire Color: Green
Function: The green wire of 2AP246 is the SWGR 2424 interlock with 236X.
If this wire should fail the close coil for 236X main feeder would be disabled.
Safety Impact: None, the 236X feeder breaker does not trip on any under voltage or no voltage condition therefore a closing action would not be required in the event of a loss of bus 242Y.

Cable No.: 2CM168
Wire Color: White
Function: The white wire of cable 2CM168 is part of the RTD circuit for Suppression Pool temp monitor 2TECM57N.
The failure of this wire would have no impact on plant operation since the redundant element would continue to monitor this particular area.
Safety Impact: No Safety Impact: Redundant indication is available.

Cable No.: 2CM132
Wire Color: Black
Function: The black wire of 2CM132 is part of the RTD circuit for Suppression Pool temp monitor 2TECM057D.
The failure of this wire would have no impact on plant operation since the redundant element would continue to monitor this particular area.
Safety Impact: No Safety Impact: See previous evaluation of 2CM168, White.

Cable No.: 2CM152
Wire Color: White
Function: The white wire of 2CM152 is part of the RTD circuit for Suppression Pool temp monitor 2TECM057J.
The failure of this wire would have no impact on plant operation since the redundant element would continue to monitor this particular area.
Safety Impact: No Safety Impact: See previous evaluation of 2CM168, White.

Cable No.: 2CM136
Wire Color: White
Function: The white wire of cable 2CM136 is part of the RTD circuit for Suppression Pool temp monitoring 2TECM057E.
The failure of this wire would have no impact on plant operation since the redundant element would continue to monitor this particular area temp.
Safety Impact: No Safety Impact: See previous evaluation of 2CM168, White.

Cable No.: 2VC110
Wire Color: White
Function: Cable 2VC110, white, is a wire connection between temperature element, OTE-VC042, and temperature monitor, 2TM-VP105. A break in 2VC110, white, would peg temperature monitor downscale.
Safety Impact: None, indication only.

Cable No.: 2DC055
Wire Color: Red
Function: Alarm contacts denoting 112Y/212Y crosstie is closed. Failure results in no alarm for crosstied buses.
Safety Impact: None, Bus breaker indication is still maintained to show status of crosstied buses.

Cable No.: 2DC042
Wire Color: Orange
Function: Spare Wire
Safety Impact: None.

Cable No.: 2CO079
Wire Color: Red
Function: Feed to ductronic horn for Central File/Archives Halon System. If wire fails the horn is silent upon alarm.
Safety Impact: None.

Cable No.: 2CO079
Wire Color: Red/Black
Function: Feed to revolving light in the Central File/Archives Halon System. No light upon alarm if wire breaks.
Safety Impact: None.

Panel No.: 2PLF6J
Terminals: GH-1 to TB2CM2 DTE8
Function: Not used
Safety Impact: No Safety Impact.

Panel No.: 2E22-P301
Terminals: TB7-51 to TB11-38
Function: The wire between TB7-51 and TB11-38 is in the K9 interlock with the K15 lockout relay circuit. If this wire were to fail the lockout relay would not be tripped following 3 unsuccessful starts as timed by the logic circuits the diesel would not continue to start since the K39 device will still time out and terminate the starting sequence.
Safety Impact: No Safety Impact: Same functions will occur due to circuit design.

SPECIAL INSPECTION PROCEDURE
TO ASCERTAIN CABLE OR CONDUCTOR DAMAGE DUE TO
MISAPPLICATION OF CRAFT TOOLS

1.0 References:

- 1.1 H. P. Foley Co. Works Instruction WI-500 Rev. 9
- 1.2 CECO QA Manual

2.0 Purpose and Scope

- 2.1 The purpose of this procedure is to describe the method used in performing a sample inspection to detect and evaluate possible cable or conductor damage due to misapplication of craft tools in the removal of cable jacketing during the termination process. This procedure will be used to evaluate work by individuals identified as having performed work in Fire Protection panel OFP16J.
- 2.2 The procedure applies to LaSalle County Station Units I & II

3.0 Prerequisites

Prior to the sample inspections the following shall be considered:

- 3.1 Personnel Safety
- 3.2 Equipment protection with necessary Out of Service (OOS) cards.
- 3.3 Accessibility of equipment as determined by plant start-up or operating conditions.

4.0 Inspection Procedure

- 4.1 Termination cards containing the names of the suspect individuals were collected from twelve (12) safety related systems as noted below. A sample of cables were selected from the following systems with considerations as stated in 3.0 above:

AP	PC
CM	RH
DG	RI
HP	RP
LP	VD
NB	VY

- 4.2 The sample selected shall be documented on Attachment A. Divisional cable will be included. Associated cable within safety related panels will be included in the sample.
- 4.3 The following as a minimum will be checked for the cables selected in the sample:
 - 4.3.1 Cable or conductors are not nicked, crimped or otherwise damaged. The inspection coverage will include the individual conductors from the terminal block along the length to where the outer jacket was removed & covered with protective tape.
 - 4.3.2 If damage is noted in the conductor the protective tape shall be removed from the cable and that area will also be inspected.
 - 4.3.3 Of the cables selected in the sample, approximately 20% of these shall have the protective tape removed and the area under this tape inspected.

- 4.4 Inspection results are documented on Attachment A. Items to be included are:
- 4.4.1 Equipment number where cable was terminated.
 - 4.4.2 Cable number
 - 4.4.3 Items inspected, as well as, indicating whether the inspection was performed with or without the removal of the protective tape.
 - 4.4.4 Results of inspection including description of damage noted.
 - 4.4.5 Signatures of inspection & verification individuals.

5.0 Evaluation of Inspection Results.

- 5.1 Damaged cable on conductors shall be identified to LaSalle Station for proper tracking and resolution according to established station procedures.
- 5.2 The items will be properly dispositioned using one of the following methods:
 - 5.2.1 Item repaired per approved procedures.
 - 5.2.2 Accept item as is based on engineering review.

6.0 Final Equipment Status

- 6.1 Protective tape and tyrap, unless specified otherwise in the repair procedure, shall be reapplied to meet the original requirements.

Prepared by

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Approved by

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UNIT II SAFETY RELATED INSPECTION SCOPE

# of Panels Inspected	# of Cables Inspected	# of Cables where Tape was removed	Approx. # of termination
16	46	42	210

INSPECTION OF UNIT II SAFETY RELATED CABLES

PANEL #	CABLE #	SEG. CODE	TAPE REMOVED	RESULTS	
			YES/NO	UNDER TAPE	EXPOSED
<u>CM System</u>					
2AP78E	2CM072	2BC	Y 95/35/-	nicked to Cu	OK
2AP78E	2CM217	2BC	Y 95/35/-	OK	OK
2C61-P001	2CM303	2YK	Y	OK	OK
2C61-P001	2CM302	2YK	Y	OK	OK
2AP78E	2CM061	2BC	Y 95/35/-	2-tiny nick	OK
<u>DG System</u>					
2H13-P629	2DG213	2YC	Y-	slight nick	OK
2AP21E	2DG014	2BC	Y-Oko Blk	OK	OK
<u>HP System</u>					
2AP07E	2HP012	2GK	Y-35/95/-	OK	OK
2AP79E	2HP019	2GC	Y-Oko Blk	nicked	OK
2AP79E	2HP018	DGP	Y-Oko Blk	nicked	OK
2AP79E	2HP0404	DGC	Y-Oko Blk	nicked	1/2 nick
2AP79E	2HP059	2GC	Y-Oko-Blk	nicked	OK
2H22-P028	2HP014	2GC	Y-35/95/-	OK	OK
2H22-P028	2HP062	2GK	Inaccessible		
2H22-P028	2HP087	2GC	Y-35/95/-	slight nick	OK
2H22-P028	2HP064	2GK	Inaccessible		
2H22-P028	2HP063	2GK	Inaccessible		
2H22-P028	2HP065	2GK	Y-35/95/-	OK	OK
2E22-P301B	2HP061	2GK	Y- Oko Blk	OK	OK
2AP79E	2HP030	2GC	Y-Oko Blk	OK	OK
2AP79E	2HP034	2GC	No	-	OK
2AP79E	2HP035	2GP	Y-Oko Blk	slight nick	OK
2AP79E	2HP037	2GC	Y-Oko Blk	OK	OK
2AP79E	2HP036	2GC	Y-Oko Blk	slight nick	OK

PANEL #	CABLE #	SEG. CODE	TAPE	RESULTS	
			REMOVED YES/NO	UNDER TAPE	EXPOSED
<u>LP System</u>					
2AP76E	2LP060	2YC	Y-35/95/C	OK	tiny nick
<u>NB System</u>					
2H22-P004	2NB354	2YK	Y-95/35/C	OK	OK
2AP80E	2NB244	2BC	No- Oko Blk -		OK
2AP80E	2NB245	2BC	Y-Okoko Blk	OK	OK
2AP80E	2NB240	2BC	Y-Okoko Blk	OK	OK
<u>PC System</u>					
2AP71E	2PC098	21C	Y-95/35/C	Main J.	OK
2H13-P623	2PC097	2YC	Y	OK	OK
2H22-P004	2PC126	21K	Y-95/35/C	OK	slight nick at lug
<u>RH System</u>					
2AP76E	2RH042	2YC	Y-95/35/-	OK	OK
2AP76E	2RH057	2YC	Y-35/95/C	nick 3/4	OK
2AP76E	2RH098	2YC	Y-95/35-	Cut to Cu	
2AP76E	2RH097	2YC	Y-95/35/C	OK	OK
2AP82E	2RH032	2BC	Y	slight nick	OK
2AP82E	2RH064	2BC	Y	OK	OK
<u>RI System</u>					
2H13-P621	2RI104	2YC	Y	OK	OK
2H13-P621	2RI110	2YC	Y	OK	OK
2H13-P621	2RI158	2YC	Y	nick	OK

VD System

2AP79E	2VD022	2GP	No	-	split
2AP79E	2VD021	2GC	Y-Oko Blk	slight nick	OK
2AP79E	2VD024	2GP	Y-Oko Blk	OK	OK
2AP79E	2VD025	2GC	Y-Oko Blk	OK	OK
2PL25J	2VD019	2BC	Y-	OK	OK
2PL25J	2VD104	2BK	No	-	OK
2PL25J	2VD099	2BK	No	-	OK
2PL25J	2VD064	2BC	Y	OK	OK

Cables not inspected

2PL24J	2VD044	23C	
2AP04E	2AP119	2YC	
2AP20E	2AP316	2YP	
2AP78E	2CM065	2BP	
2AP71E	2CM064	2YP	
2AP81E	2DG022	2BP	
2AP04E	2DG070	2YC	
2AP80E	2DG020	2BP	
2AP76E	2LP030	2YP	
2AP04E	2LP086	2YC	
2DC11E	2LP034	WYC	
2AP82E	2RH162	2BP	
2DC06E	2RI027	2YP	
2DC06E	2RI123	2YC	
2DC06E	2RI027	2YP	
ECSA at 2B21-F022B	2RP015	A1C	
0030N			