CASE NO. 4-2010-061

United States
Nuclear Regulatory Commission

Report of Investigation

SAN ONOFRE NUCLEAR GENERATING STATION 2

Failure by (b)(7)(C) to Follow Procedures During Equipment Restoration Following Maintenance

Office of Investigations

Reported by OI:RIII

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FOIA- 2012-0070

A-H

January 20, 2011

MEMORANDUM TO: Elmo E. Collins, Regional Administrator
Region IV

FROM: Scott J. Langan, Director
Office of Investigations Field Office, Region III

SUBJECT: SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 2 – FAILURE BY (b)(7)(C) TO FOLLOW PROCEDURES DURING EQUIPMENT RESTORATION FOLLOWING MAINTENANCE (CASE NO. 4-2010-061/RIV-2010-A-0079)

Enclosed, for whatever action you deem appropriate, is the Office of Investigations (OI) Report of Investigation concerning the above matter.

Please note that documents may have been gathered during the course of the investigation that are not included in either the report or the exhibits. This additional documentation would be maintained in the OI case file and available for the staff's review upon request.

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Enclosure:

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Distribution:
s/f (4-2010-061)
c/f
(b)(7)(C)

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OFFICIAL RECORD COPY

Title: SAN ONOFRE NUCLEAR GENERATING STATION 2

FAILURE BY (b)(7)(C) TO FOLLOW PROCEDURES DURING EQUIPMENT RESTORATION FOLLOWING MAINTENANCE

Licensee:

Southern California Edison Company
P. O. Box 128
San Clemente, CA 92674-0128

Docket No.: 05000361

Allegation: RIV-2010-A-0079

Case No.: 4-2010-061

Report Date: January 20, 2011

Control Office: OI:RIV

Status: CLOSED

Reported by:

(b)(7)(C)

(b)(7)(C) Special Agent
Office of Investigations
Field Office, Region III

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Reviewed and Approved by:

Scott J. Langan

Scott J. Langan, Director
Office of Investigations
Field Office, Region III

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SYNOPSIS

This investigation was initiated by the U.S. Nuclear Regulatory Commission, Office of Investigations, Region IV, on June 9, 2010 to determine whether (b)(7)(C) (b)(7)(C) willfully violated established procedures in the wiring of a terminal board at the San Onofre Nuclear Generating Station (SONGS).

Based on the evidence developed, this investigation did not substantiate the allegation that (b)(7)(C) willfully violated established procedures while wiring a terminal board at SONGS.

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TESTIMONIAL EVIDENCE

Exhibit

(b)(7)(C) 10

(b)(7)(C) Southern California Edison (SCE) 11

(b)(7)(C) 12

(b)(7)(C) SCE 13

(b)(7)(C) 14

(b)(7)(C) 15

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DOCUMENTARY EVIDENCE

Apparent Cause Evaluation (ACE) (b)(7)(C) (b)(7)(C) outlines the fact finding conducted by licensee personnel into the main transformer breakers becoming tripped. The conclusion noted human error on the part of (b)(7)(C) (b)(7)(C) (b)(7)(C) and (b)(7)(C) caused the incident (Exhibit 3).

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Nuclear Notification (NN) (b)(7)(C) (b)(7)(C) initiated the Human Factors and Prompt investigation on the incident (Exhibit 4).

Unit 2 Work Order (b)(7)(C) Rework (b)(7)(C) remove equipment/wiring with a scheduled start date (b)(7)(C) outlined the work being completed by (b)(7)(C) and (b)(7)(C) Within the work order, form SO123-II-15.3 (commonly referred to as 15.3) was included and contained the initialed off work performed by (b)(7)(C) and (b)(7)(C) (Exhibit 5).

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Prompt Investigation Report of NN (b)(7)(C) dated (b)(7)(C) outlined the information gathered by the licensee relative to the attempted start of (b)(7)(C) and corresponding breaker becoming tripped (Exhibit 6).

General Procedure SO123-XV-20, Verification Practices, Revision 3, effective date August 7, 2009 outlines the licensee procedural verification practices. These practices are directly related to the work assigned to (b)(7)(C) and (b)(7)(C) (Exhibit 7).

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Instrumentation Procedure SO123-II-15.3, Temporary System Alteration and Restoration Form, Revision 17, effective date April 17, 2009 outlines the licensee instrumentation procedures for an independent verifier. This procedure is directly relevant to the work being performed by (b)(7)(C) and (b)(7)(C) (Exhibit 8).

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NRA Procedure SO123-XXX-3.8, Potential Deliberate Noncompliance Evaluations, Revision O, effective date March 30, 2010 outlines the licensee procedural expectations in the review of potential deliberate noncompliance events. This procedure was relevant to the review conducted by licensee personnel on the case matter (Exhibit 9).

> Agent's Note: The wiring conducted by (b)(7)(C) and (b)(7)(C) took place on (b)(7)(C) By the time ACE (b)(7)(C) was completed the above listed procedure was in effect.

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DETAILS OF INVESTIGATION

Applicable Regulations

10 CFR 50.5, Deliberate Misconduct (2009 and 2010 Editions).

Technical Specification 5.5.1.1.a, Written procedures shall be established, implemented and maintained.

Regulatory Guide 1.33, Revision 2, Appendix A, Maintenance of safety related equipment should be performed in accordance with written procedures.

Purpose of Investigations

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This investigation was initiated on June 9, 2010 by the U.S. Nuclear Regulatory Commission (NRC), Office of Investigations (OI), Region IV (RIV), to determine whether (b)(7)(C) and (b)(7)(C) with (b)(7)(C) (b)(7)(C) willfully violated established procedures in the wiring of a terminal board at the San Onofre Nuclear Generating Station (SONGS).

Background

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On April 29, 2010, Southern California Edison's (SCE's) SONGS, San Clemente, California, notified NRC:RIV of the identification of potential willful misconduct by (b)(7)(C) (b)(7)(C) According to the licensee, during an attempt to start a (b)(7)(C) (b)(7)(C) the breaker tripped immediately due to a differential over-current. SONGS advised that during the investigation, they determined that the over-current was caused by a wiring discrepancy on terminal board "TB," where it was found that the first two of three connections were not per the drawing (the wires were connected 2, 1, and 3 instead of 1, 2, 3), which caused (b)(7)(C) to attempt to rotate in the opposite direction for which it was designed. SONGS reported that a Human Factors and Prompt investigation determined that during the restoration of the wires, the (b)(7)(C) did not actually check the leads to ensure that they were correctly landed on the terminal block. SONGS added that (b)(7)(C) (b)(7)(C) initialed-off the work without actually checking the placement of the wires, contrary to the licensee's instrumentation procedure S0123-11-15.3. The other (b)(7)(C) (b)(7)(C) working with (b)(7)(C) was identified as (b)(7)(C) SONGS performed a willfulness review and documented the incident in Nuclear Notification (b)(7)(C) (Exhibit 1).

Coordination with NRC Staff

On June 8, 2010, the RIV Allegation Review Board (ARB) convened to review this matter which was provided by personnel at the SONGS plant. The ARB requested OI:RIV to initiate an investigation as to whether (b)(7)(C) or (b)(7)(C) willfully failed to follow procedures while wiring a terminal block in (b)(7)(C) (Exhibit 2).

Coordination with Regional Counsel

This investigation was initiated with the concurrence of RIV Regional Counsel, (b)(7)(C) that if substantiated, the allegation would be a violation of NRC regulations.

Testimonial Summary

(b)(7)(C), explained he previously worked as a (b)(7)(C) He acknowledged having worked as a (b)(7)(C) during the time frame when the incidents under investigation occurred (b)(7)(C) During the pre-job brief conducted by (b)(7)(C) on (b)(7)(C) he estimated the duration of the briefing to have been in the 10-15 minute range and described the briefing as routine in nature (Exhibit 10, pp. 3-4, 9-10).

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(b)(7)(C) understood (b)(7)(C) and (b)(7)(C) had previously completed "Temporary System Alteration and Restoration" logs (form 15.3) which were utilized in conjunction with the work in (b)(7)(C) (b)(7)(C) explained his understanding of the term verify required a worker to look at the item in question. It was acknowledged by (b)(7)(C) that (b)(7)(C) was conducting the wiring and (b)(7)(C) was the individual who was to have verified the wires were installed in the correct manner. (b)(7)(C) disavowed training was an issue in the incident. "They (b)(7)(C) are (b)(7)(C) Any time I ever verified something, I looked at it, you know, and verified that it's one, two, three. I mean how much training do you need to verify something" (Exhibit 10, pp. 14-16).

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Several questions were directed at (b)(7)(C) as to whether (b)(7)(C) or (b)(7)(C) had willfully violated procedures. (b)(7)(C) was identified as having more responsibility for the incident as he documented that he verified the wiring when he did not. (b)(7)(C) disavowed knowing whether the procedural lapse was willful or ineptitude. The interviewing agent noted to (b)(7)(C) that during a review process at the plant, it had been concluded that there had been a willful aspect to the procedural violation. (b)(7)(C) noted, "I can't say what he (b)(7)(C) was thinking, but I do think he should have looked at it, if he's going to sign that he verified it" (Exhibit 10, pp. 20-22, 30).

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(b)(7)(C) noted as a (b)(7)(C) (Exhibit 10, pp. 34-35).

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(b)(7)(C) SCE, advised she had spent the last (b)(7)(C) (b)(7)(C) at the SONGS plant. She explained in January 2008 the NRC issued a confirmatory order requiring the plant "to prevent and detect willful violations." An action from the order was to implement a monitoring program wherein events at the plant were screened or evaluated for willfulness. SCE procedure SO-123-XXX-3.8 was identified as the procedure implementing this process (Exhibit 9; Exhibit 11, pp. 3-5, 7).

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NN (b)(7)(C) with a creation date of (b)(7)(C) was reviewed with (b)(7)(C) She noted that during the course of the Apparent Cause Evaluation (ACE) it was surmised that "a potential deliberate noncompliance" had occurred and in accordance with procedures, (b)(7)(C) was tasked to conduct a willfulness evaluation (Exhibit 4; Exhibit11, pp. 8-12).

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(b)(7)(C) noted from her understanding of the events, procedures and training had been adequate. Upon checking with the worker's peers, it was understood "verification means to actually look at each of the wire numbers, before signing." (b)(7)(C) recalled (b)(7)(C) and (b)(7)(C) stated they trusted each other and therefore had not checked each other's work (Exhibit 11, pp. 18-20).

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(b)(7)(C) explained she coordinates the evaluation of incidents in the corrective action plan for willfulness. She stated the verification form initialed by (b)(7)(C) without having looked at the wiring, was a conscious or willful act of noncompliance. (b)(7)(C) understood the workers did not feel it was necessary to check each other's work as they had been working with each other a long time (Exhibit 11, pp. 23, 26-27).

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(b)(7)(C) advised she did not believe either worker (b)(7)(C) or (b)(7)(C) had been entered into the Personnel Access Data System (PADS) system in a negative way because of the incident. She explained since the middle of 2008 the plant has reviewed events for willfulness because of the previously noted confirmatory order. Approximately 10 events from 320 have been identified as deliberate noncompliance (Exhibit 11, pp. 31, 34-35).

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(b)(7)(C) stated he had worked as a (b)(7)(C) during the appropriate time frame of (b)(7)(C) He recalled working on Unit 2 at the plant and each shift included four to eight workers (Exhibit 12, pp. 2-4, 6-7).

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On the day in question (b)(7)(C) stated he and (b)(7)(C) "were landing wires" for existing electrical lines. (b)(7)(C) acknowledged he had connected electrical lines that day and initialed off as having performed the line restoration. (b)(7)(C) advised in February 2010 (no specific date noted) he was contacted by (b)(7)(C) (no specific individual noted) as "they wanted to get a better understanding of what happened, and the procedure for doing it." He did not recall who he met with from (b)(7)(C) (Exhibit 5, p. 57; Exhibit 12, pp. 9-14).

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(b)(7)(C) described having worked with (b)(7)(C) several times during the course of the outage and acknowledged having completed the Performed By column of the work order documentation while (b)(7)(C) completed the Verified By column. "His (b)(7)(C) job was to observe me . . . we did it, like a positive verbal communications . . . I would verify, verbally verify the cable number, identify the cable we're going to land, and repeat that to him, and say, that's correct, and then he'd repeat it again . . . he would say that, I would repeat it to him and he would verify that and repeat it again, and I would land that wire, and say okay, cable such and such, wire two, point two, and I would repeat that to him, he would repeat it back to me, and so, it landed. That was the procedure." (b)(7)(C) stated both he and (b)(7)(C) read the wires incorrectly or during the next month and a half other workers re-worked the wiring in the box, causing the trip. (b)(7)(C) was not aware of re-working having occurred, but noted, "it's a possibility" (Exhibit 12, pp. 15-19).

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(b)(7)(C) recalled any procedural training related to verification procedures would have consisted of a procedural outline being read. (b)(7)(C) stated the form documenting the wiring work was completed on the night the work was completed. He further described the work in part as follows. "They were very narrow cabinets, only room for one person. So, the verifier (b)(7)(C) who was also doing the writing, stood behind me at the time. There were times when he was the restorer and I was the verifier. Stood behind, read the cable number, positive verbal communication on which cable we were working on, what terminal block we were working on,

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and the location, and that's the way we working on, and the locations, and that's the way we handled our verification . . . We felt we were following the procedure correctly" (Exhibit 12, pp. 20, 24-28).

(b)(7)(C) advised the issue of verification was not covered during the pre-job briefing. (b)(7)(C) was identified as the (b)(7)(C) who would have provided the briefing. (b)(7)(C) did not recall any environmental factors that impacted the work or any aspect of being hurried. (b)(7)(C) stated, "We communicated clearly, we felt we were following the right steps to do the job, and that everything was moving smoothly" (Exhibit 12, pp. 30, 32, 35-36).

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(b)(7)(C) reiterated from the time of the work being completed in November (2009) to the time the wiring issue became known in February (2010), many people were working in the cabinets. Upon further discussion of the procedural expectations (b)(7)(C) denied the understanding that (b)(7)(C) was required "to physically put his eyes on those wires." (b)(7)(C) was questioned as to how his peers understood verification required a visual confirmation. He responded, "They must have had more experience with procedures at SONGS, that I did not have" (Exhibit 12, pp. 37, 42).

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The ACE was reviewed with (b)(7)(C) particularly the section which summarized his interview with (b)(7)(C) He noted in part, "I'm not aware of the complete verification requirements . . . I don't know what is necessary." (b)(7)(C) was not aware of any instances when (b)(7)(C) willfully violated procedures (Exhibit 3; Exhibit 12, pp. 45-47, 54).

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(b)(7)(C) advised upon an attempt to run the (b)(7)(C) the relays tripped and, "I knew that something was wrong with either the relay setting or the line to the relay." (b)(7)(C) explained in his position he would not have interacted with or known (b)(7)(C) or (b)(7)(C) (Exhibit 13, pp. 3, 5, 8).

(b)(7)(C) 7c

Upon review of ACE (b)(7)(C) and (b)(7)(C) confirmed the paperwork would indicate that (b)(7)(C) performed the wiring and (b)(7)(C) verified it. He described the significance of the incident in part as follows. "The significance of the mis-wiring is the protection relay has a function to trip on differential and what that means is, when you give it power, if it sees any variance in the current, it will trip, and this wiring configuration it will trip instantly, because it's not receiving the correct phase" (Exhibit 13, pp. 11-13).

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(b)(7)(C) advised he was not involved in completing the apparent cause investigation, but upon being contacted provided information about the event. He noted having attended and was involved in the prompt investigation of the incident. (b)(7)(C) described the incident as "a lapse of judgment" (Exhibit 13, pp. 19-22).

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(b)(7)(C) advised he had worked at the SONGS plant during the approximate time frame of (b)(7)(C) (b)(7)(C) noted he had worked at SONGS during an outage approximately 1½ years previously. He denied having knowingly violated any procedures while working at the SONGS plant. (b)(7)(C) stated during the most recent outage he reported to (b)(7)(C) (Exhibit 14, pp. 2-4, 7).

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(b)(7)(C) recalled on (b)(7)(C) he was working with (b)(7)(C) and during the completion of work determined "we're going to have to take these wires off." He further noted, "If you take the wires off . . . you got to fill out these papers, the 15.3's and stuff, which we really

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didn't know about." (b)(7)(C) recalled he and (b)(7)(C) were working the night shift and the area where the box was had thousands of connections. He acknowledged (b)(7)(C) was attaching the wires to the box. "And as he attached them, I wrote them down, on this. As he - - he would say, you know, 2XX-U242-A7 wire one, point one, and I would go okay" (Exhibit 14, pp. 8-9, 12-15).

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(b)(7)(C) was questioned whether he looked at the wires. He responded in part as follows. "That where I have a really big problem now. We - - because actually, we kind of knew that, but we were not formally trained on that procedure 15.3 . . . I don't remember reading it, but you know, maybe he's right, I don't know . . . I think if we would have been trained on that, specifically, on this procedure, this would have never happened. But I still take - - I got to take ownership because I verified" (Exhibit 14, pp. 16-17).

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(b)(7)(C) advised he wrote a statement as a part of the ACE. He noted having tried the best he could to outline what had happened. (b)(7)(C) denied having received the 15.3 policy prior to completing the work in question. There was nothing noteworthy from the pre-job brief recalled by (b)(7)(C) He noted that (b)(7)(C) said "nothing about 15.3's on this pre-job brief." (b)(7)(C) acknowledged having initialed off as having verified the wiring. "That was my fault, for not looking at it." He added, I "wasn't really trained" (Exhibit 14, pp. 18-20, 23-25).

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Upon further questioning (b)(7)(C) acknowledged he trusted (b)(7)(C) and had noted that trust was a contributing factor as to why he had not put eyes on the wiring. (b)(7)(C) advised if the other (b)(7)(C) understood they were required to put eyes on the wires prior to putting initials on the relevant documents they must have been trained. "I made a mistake. I didn't look at the log. I admit that. Plus I felt (b)(7)(C) - - felt confident in (b)(7)(C) work" (Exhibit 14, pp. 25-27).

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(b)(7)(C) described having utilized three way communications with (b)(7)(C) when completing the documentation for the work. He again acknowledged not having looked at the wires. (b)(7)(C) also expressed the understanding that there would be "somebody checking the checker" so as to ensure no disconnects occurred. The interviewing agent again challenged (b)(7)(C) as to whether he did not know on (b)(7)(C) that he had violated procedures. (b)(7)(C) responded as follows. "I didn't know the full procedures and I relied on (b)(7)(C) (b)(7)(C) electrical skills, too" (Exhibit 14, pp. 29-31, 33-37).

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(b)(7)(C) advised there were no external factors (noise, time pressure, etc.) which contributed to the incident under investigation. He reiterated this was the first time he had completed a form 15.3 and that had he received more training this would not have happened (Exhibit 14, pp. 38-41).

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(b)(7)(C), advised shortly after (b)(7)(C) (b)(7)(C) he became aware of the situation and understood "there might be an issue with the wires." (b)(7)(C) explained he had taken part in a review of the incident as a member of a human performance review board (Exhibit 15, pp. 3, 6, 9-10).

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As a part of the human performance review board proceedings, (b)(7)(C) was interviewed. (b)(7)(C) was there and we were talking to him about, did he understand the necessity of doing a verification, and he indicated the necessity of doing a verification, and he indicated that he did, but he wasn't really sure, because [he] wasn't (b)(7)(C) and he

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hadn't had the 15.3 training . . . So I asked him, 'do you understand, you're required to do a verification' . . . He told me, 'yes, I understand that.' So I asked him, 'Well why did you not do that?' He said, 'I had been working with this guy – my buddy for a long period of time and I trust him. I felt that he knew what he was doing and I failed to do my job.'" (b)(7)(C) further explained his recollections of (b)(7)(C) assertions to the human performance review board. "He (b)(7)(C) said, 'I know that – I understand what I did was wrong. I got that now. I don't feel like I had all the training I needed. I don't feel like I understood exactly what should have been done.' He was really unclear from – it appeared, from the directions that he was given" (Exhibit 15, pp. 11-13).

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(b)(7)(C) stated he questioned (b)(7)(C) as to the quality and detailed nature of the pre-job briefing. (b)(7)(C) expressed uncertainty of what had been covered during the pre-job briefing. (b)(7)(C) noted neither (b)(7)(C) nor (b)(7)(C) were (b)(7)(C) and had they been so, a better understanding of the requirements would have been known. (b)(7)(C) made the decision to terminate (b)(7)(C) employment with (b)(7)(C) because of a procedural violation, regardless of it being considered willful or not. "I don't think that he (b)(7)(C) outright willfully said, 'I just ain't going to do it.' I think there is [are] other factors, but I still think he's accountable for his actions" (Exhibit 15, pp. 13-17, 22-23).

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Agent's Analysis

(b)(7)(C) was the (b)(7)(C) in charge of the work being performed on (b)(7)(C) He expressed the view that the process of conducting verifications would require visual observation of relevant items. He declined to provide input as to whether or not the procedural lapse was willful (Exhibit 10, pp. 14-16, 30). (b)(7)(C) interviewed (b)(7)(C) as a part of the human performance review board shortly after (b)(7)(C) tripped on (b)(7)(C) He recalled (b)(7)(C) being unclear of the precise procedural expectation (Exhibit 6; Exhibit 15, pp. 13). (b)(7)(C) was an (b)(7)(C) who oversaw the work order which outlined the work being done by (b)(7)(C) and (b)(7)(C) He described being involved in the prompt investigation of the event and characterized it as having been a "lapse of judgment" (Exhibit 13, pp. 21-22).

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(b)(7)(C) described the rewiring work as being completed in cramped conditions and explained there had been a verbal verification of the work but not a visual confirmation. He advised if other (b)(7)(C) understood verification to require a visual confirmation then they must have had more experience or training (Exhibit 12, pp. 26-28, 42). (b)(7)(C) acknowledged having initialed off on the documentation without having visually verified the wiring. He explained utilizing three way communication with (b)(7)(C) but emphasized he did not fully know the procedural expectations (Exhibit 14, pp. 24-25, 29-31).

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The testimony and documents compiled during this investigation indicate a clear procedure violation. However, evidence was not developed to conclude the procedure violation was done willfully.

Conclusion

Based on the evidence developed, this investigation did not substantiate the allegation that (b)(7)(C) or (b)(7)(C) willfully violated established procedures while wiring a terminal board at SONGS.

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LIST OF EXHIBITS

Exhibit	Description
1	Investigation Status Record, dated June 9, 2010 (1 page).
2	Allegation Review Board package dated June 8, 2010 (21 pages).
3	ACE (b)(7)(C) (42 pages).
4	NN (b)(7)(C) created (b)(7)(C) (12 pages).
5	Unit 2 Work Order (b)(7)(C) start date (b)(7)(C) (59 pages).
6	Prompt Investigation Report of (b)(7)(C) dated (b)(7)(C) (4 pages).
7	General Procedure SO123-XV-20, effective date August 7, 2009 (22 pages).
8	Instrumentation Procedure SO123-II-15.3, effective date April 17, 2009 (8 pages).
9	NRA Procedure SO123-XXX-3.8, effective date March 30, 2010 (12 pages).
10	Transcript of Interview with (b)(7)(C) dated August 5, 2010 (39 pages).
11	Transcript of Interview with (b)(7)(C) dated August 3, 2010 (36 pages).
12	Transcript of Interview with (b)(7)(C) dated August 4, 2010 (59 pages).
13	Transcript of Interview with (b)(7)(C) dated August 4, 2010 (31 pages).
14	Transcript of Interview of (b)(7)(C) dated August 4, 2010 (43 pages).
15	Transcript of Interview of (b)(7)(C) dated August 4, 2010 (28 pages).

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