August 20, 2004

Mr. Fred Dacimo
Site Vice President
Entergy Nuclear Operations, Inc.
Indian Point Energy Center
295 Broadway, Suite 1
P.O. Box 249
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT NUCLEAR GENERATING UNIT NO. 2 - NRC INSPECTION REPORT 05000247/2004009

Dear Mr. Dacimo:

On May 28, 2004, the US Nuclear Regulatory Commission (NRC) completed on-site inspection activities at the Indian Point Nuclear Generating Unit No. 2 (IP2). The enclosed inspection report documents the inspection results, which were discussed on July 20, 2004, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel. The focus of the inspection was on the separation of electrical cables and your activities to ensure conformance with established design criteria.

Based on the results of this inspection, the inspectors identified three findings of very low safety significance (Green). These findings were determined to be violations of NRC requirements. However, because of the very low safety significance and because the issues have been entered into your corrective action program, the NRC is treating the findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response with the basis for your denial within 30 days of the date of this letter, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspector at Indian Point 2.

The NRC examination of cable separation at IP2 identified cable and raceway configuration and design control issues. These findings were of very low safety significance because there was no impact on the capability of plant equipment to perform required functions. However, appropriate configuration and design control are important to ensure that future changes to the plant are consistent with the design basis. The NRC will continue to provide oversight of your confirmatory activities related to your electrical separation Design Basis Improvement Project through routine inspections to examine specific corrective actions.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA by B. E. Holian Acting for/

Wayne D. Lanning, Director
Division of Reactor Safety

Docket No. 50-247
License No. DPR-26

Enclosure: Inspection Report 05000247/2004009
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.	50-247
License No.	DPR-26
Report No.	05000247/2004009
Licensee:	Entergy Nuclear Northeast
Facility:	Indian Point Nuclear Generating Unit 2
Location:	Buchanan, New York 10511
Dates:	May 17, 2004 - May 28, 2004
Inspectors:	H. Eichenholz, Team Leader, DRS L. Scholl, Senior Inspector, DRS J. Lilliendahl, Reactor Inspector, DRS J. Knox, Electrical Specialist, NRR V. Goel, Electrical Specialist, NRR
Approved by:	John F. Rogge, Chief Electrical Branch Division of Reactor Safety

Enclosure

TABLE OF CONTENTS

SUMMARY OF FINDINGS

IR 05000247/2004009; 05/17/04 - 05/28/04; Indian Point Nuclear Generating Unit No. 2; Operability Evaluations, Problem Identification and Resolution.

The report covered a two week period of on-site inspection by region-based inspectors with support from two members of the Electrical and Instrumentation and Controls Branch (EEIB) of NRR during the first week of inspection. In-office reviews were also performed following the on-site inspection. Three Green non-cited violations (NCVs) were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," that includes several examples where the licensee failed to implement adequate design controls during engineering activities associated with electrical cable and raceway design and configuration control. Corrective actions to address these issues have been included in Design Basis Improvement (DBI) Project PI-10, Electrical Separation.

  This finding involves the failure of the licensee to implement effective design controls involving electrical cable separation at Indian Point 2 was a performance deficiency. This finding was determined to be greater than minor because if the conditions (weaknesses in design control) were left uncorrected it could result in a more significant safety concern. Specifically, the failure to implement electrical separation design criteria could allow cable fault conditions to adversely impact the availability or reliability of safety functions. This finding could not be evaluated using the SDP, because there was no direct impact identified on Initiating Event, Mitigating Systems or Barrier Integrity cornerstones of reactor safety. In accordance with the guidance in IMC 0612, a management review has determined that the finding is of very low safety significance (Green) because, while there was no current impact, effective implementation of the design controls for electrical cable separation is important to ensure that future changes will be consistent with the Indian Point 2 design basis. (Section 4OA5.1.b.2.a)

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," that includes several examples where the licensee failed to properly identify and correct conditions adverse to quality associated with electrical cable and raceway design and configuration control. Corrective actions to address these issues have been included in DBI Project PI-10, Electrical Separation.

This finding involves the failure of the licensee to take adequate corrective action to address previously identified conditions adverse to quality (data anomalies for plant cabling, drawing inadequacies involving plant cable trays , and inadequate training of the plant cabling data system) was a performance deficiency. This finding was determined to be greater than minor because if left uncorrected these conditions could result in design control failures and a more significant safety concern. Specifically, the failure to implement electrical separation design criteria could allow cable fault conditions to adversely impact the availability or reliability of safety functions. This finding could not be evaluated using the SDP, because there was no direct impact identified on Initiating Event, Mitigating Systems or Barrier Integrity cornerstones of reactor safety. In accordance with the guidance in IMC 0612, a management review has determined that the finding is of very low safety significance (Green) because, while there was no current impact, effective implementation of the design controls for electrical cable separation is important to ensure that future changes will be consistent with the Indian Point 2 design basis. (Section 4OA5.1.b.2.b)

- Green. The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVII, "Quality Assurance Records," for the failure of the licensee to properly control and maintain documents associated with the Cable Separation Program. Corrective actions to address this issue have been included in DBI Project PI-10, Electrical Separation.

  The finding involves the failure of the licensee to maintain records concerning the Cable Separation Program at Indian Point 2 was a performance deficiency. This finding was determined to be greater than minor because if the contributing factors that allowed this failure to maintain and retrieve records that furnish evidence of activities affecting quality were left uncorrected it could result in a more significant safety concern. Specifically, the more significant condition could be that the electrical cables installed by future modifications that failed to meet established physical or electrical separation design criteria could allow cable fault conditions to adversely impact the availability or reliability of safety functions. This finding could not be evaluated using the SDP, because there was no direct impact identified on Initiating Event, Mitigating Systems or Barrier Integrity cornerstones of reactor safety. In accordance with the guidance in IMC 0612, a management review has determined that the finding is of very low safety significance (Green) because, while there was no current impact, maintaining quality records of the Cable Separation Program is important to ensure that future changes will be consistent with the Indian Point 2 design basis. (Section 4OA5.1.b.2.c)

B. Licensee-Identified Violations

None

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution

Cross References to PI&R Findings Documented Elsewhere

Section 4OA5.1.b.2.b discusses a non-cited violation of 10 CFR 50 Appendix B, Criteria XVI, Corrective Action. The finding involves examples of failing to properly identify and correct conditions adverse to quality associated with design and configuration controls of the plant electrical cable and raceway systems.

4OA5 Other

1. (Closed) URI 05000247/200402-07: Wire and Raceway System (WARS) to Electrical Cable and Race Information System (ECRIS) Data Conversion Anomalies

Background

An NRC inspection was conducted during the period of March 15 - 18, 2004, to review issues associated with Entergy's conversion from WARS to ECRIS. The purpose of the inspection was to verify that Entergy had an adequate basis to conclude that data conversion anomalies, generated when transferring computer data contained in WARS to ECRIS, did not result in any operability or immediate safety issues with plant systems. The NRC determined that Entergy had an appropriate basis to conclude that there were no immediate safety issues associated with the electrical cable issues that were raised. During the on-site inspection and subsequent in-office review of associated documentation, some specific issues were identified that warranted additional NRC review. These issues were documented in NRC Inspection Report No. 05000247/2004002 as unresolved item URI 50-247/2004-002-07. During the period of May 17-28, 2004, a follow-up NRC inspection was conducted to review the elements of this unresolved item.

a. Inspection Scope

The inspection scope consisted of reviewing the nine elements of unresolved item URI 50-247/04-02-07 and the results of the Entergy investigation of the concerns associated with the WARS to ECRIS conversion. The inspectors conducted interviews with engineering and design personnel (including contractors) and reviewed condition reports, engineering evaluations, modifications, safety assessments, plant procedures, and other documents to assess the safety significance of the issues and determine whether the IP2 facility was in compliance with NRC requirements related to electrical cable separation. The inspection also included a review of design controls that support plant modification activities. The results of these reviews are documented below in a format consistent with the nine elements of the unresolved item.

b.1 Findings

(1) Further assessment of the operability issues as they relate to the existence of data conversion anomalies and configuration control practices at IP2

Summary:

As a result of reviewing this part of the unresolved item, the inspectors identified no information indicating that there are immediate safety issues or specific operability concerns involving the installed electrical cabling at IP2. Included in this review were the following issues: a previous cable separation review which did not include of the cable spreading room, and potential inadequacies with the Cable Separation Program reports, questionable data in WARS and in ECRIS, and a concern that WARS and ECRIS are being used for other purposes than the routing of cables at IP2. Regarding the cable spreading room issue, the inspectors concluded that, based on the activities and analyses already completed by ConEd, and planned Entergy confirmatory actions, separation in the cable spreading room is being appropriately addressed. The Cable Separation Program reports that were not properly controlled and entered into the document control program by ConEd provided some of the basis for confirming compliance with electrical separation criteria as documented in the electrical design specification and DBD. However, the inspectors' determined that the lack of finalized documents does not impact the validity of the ongoing DBI/DBD work. The latter two concerns are discussed in Items 6 and 7. Two Green non-cited violations (NCVs) were identified. One Green NCV involved an example of failure to comply with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, related to not providing a timely operability review for conditions adverse to quality (NCV 50-247/0409-02, see Section b.2.b later in this report), and the second Green NCV involved a failure to comply with 10 CFR 50, Appendix B, Criterion XVII, Quality Assurance Records, related to improper control and maintenance of documents associated with the Cable Separation Program (NCV 50-247/0409-03, see Section b.2.c later in this report).

Details:

On August 1, 2002, CR-IP2-2002-07454 was initiated to identify that the anomalies documented in the Data Transfer Verification Report (DTVR) may represent some data quality issues. The initiator did not specify in the CR document that an operability determination was required, and the inspectors noted that none was performed by the Entergy organization. Subsequently, as a result of a lack of progress on the resolution of the data anomalies, this individual initiated CR-IP2-2003-02665, which stipulated that an operability determination was required. Entergy Procedure ENN-LI-102, Corrective Action Process, specifies that the operability review be performed in accordance with procedure ENN-OP-104, Operability Determinations. Licensee personnel responsible for performing the determination used this procedure and designated the classification of operability in the condition report system to be "ADMIN-NA." This classification means that the condition is an administrative documentation/procedure violation that is not equipment related, and as such, is not subject to the operability determination guidance contained in NRC Generic Letter 91-18, Information to Licensees Regarding NRC Inspection Manual Section 9900 on Resolution of Degraded and Nonconforming Conditions. The documented basis in the CR to use this classification was that all

systems were operable pending further investigation. On June 24, 2003, the two CRs were closed to Engineering Request ER-IP2-03-20601 without Entergy having provided any documented basis for the specified operability classification. The failure to properly address the issue of operability, as required by the corrective action program, is Example 1 of a violation of 10 CFR 50 Appendix B, Criteria XVI, Corrective Action (NCV 50-247/0409-02, see Section b.2.b later in this report).

NRC Inspection Report 05000247/2004002 documented the results of the initial NRC review of CR-IP2-2004-01059 that was initiated by Entergy on March 4, 2004. This CR was issued to better track and document resolution of DTVR discrepancies. As noted in the inspection report, the NRC concluded that Entergy had an appropriate basis to conclude that there were no immediate safety issues associated with the electrical cable separation issues that had been raised and that further NRC inspection would continue. During the current inspection a number of additional issues involving cable separation conditions at IP2 were reviewed to assess the potential impact on the operability of safety related equipment at the plant. These issues included the following: (a) the cable spreading room (CSR) was not included in the in-depth review of individual cable installations as part of the IP2 Cable Separation Program conducted between 1989 and 1995; (b) the Cable Separation Program reports were not completed, data checked, verified and approved, and were not entered into the plant document management system even though this information was being used to provide verification of the raceway system and was used in the development of the IP2 cable and raceway design basis; (c) there is questionable data in WARS and in ECRIS based upon 329 pages of data anomalies; and (d) that potentially WARS and certainly ECRIS are being used for other purposes than the routing of cables at IP2. Issues (a) and (b) are discussed in this item of the report. Issues (c) and (d) will be discussed in Items 6 and 7 later in this report. The NRC's review of the aforementioned issues have provided no information that would invalidate the previous conclusion that there were no immediate safety issues, or specific operability concerns, involving the installed electrical cabling at IP2.

Cable Spreading Room (Item a.)

Regarding the concern that the CSR was not included in the IP2 Cable Separation Program, the inspectors determined that the IP2 Cable Separation Program had considered the need for field verification of cables in this area of the plant. The applicable considerations were documented in an October 11, 1994, position paper on CSR Field Verification, and a September 2, 1992, position paper on Instrumentation Cable Field Verification. Both engineering position papers were prepared by TENERA, L.P., an engineering consultant retained by ConEd, the licensee at that time.

The latter document provided the selection criteria for sampling instrumentation cables as part of the Cable Separation Program. The instrumentation cables generally fall into 3-categories that included the reactor protection system (RPS), engineered safety features actuation system (ESFAS), and post-accident monitoring system (PAMS). This position paper indicated that the majority of the RPS and ESFAS instrument circuits de-energize when performing their safety function (fail-safe); however, the PAMS circuits must remain energized during accident conditions. Therefore, the PAMS cables

were assigned the highest priority and the cables associated with fifteen instruments were recommended for field verification. Also, the instrumentation selection process took credit for a 1970 field check of cable separation conducted by the construction contractor to verify that cables were routed in the correct trays. Since most of the RPS and ESFAS instrument channel cables were included in the 1970 field verification, TENERA concluded that they would not need to be field verified as part of the Cable Separation Program.

The position paper on the CSR field verification described the screening methodology which took credit for other walkdown efforts and analyses for cables in the CSR, such as field verification of all heavy power cables and specified instrument loops. Other considerations included analysis of circuits that did not fail-safe on loss of power and power supply cables routed circuit-by-circuit. The information in the position paper also indicated that power cabling for instrument racks in the control room being fed through the cable spreading room were field verified, and where separation anomalies were identified, modifications were performed to improve separation. Entergy provided the inspectors with information on the modifications as well as information that confirmed that some walkdowns were accomplished in the CSR. Entergy also indicated that some additional work was performed in the CSR that included items such as the installation of barriers at critical crossover points and fixing dividers in raceways.

ConEd concluded that, based upon the information in the two position papers, additional walkdowns of cabling in the CSR were unnecessary. Specifically, of the 2928 cables entering the CSR there were 2441 cables screened out in accordance with the established criteria. However, further investigations were recommended by TENERA for some circuits. These recommendations included verification that qualified circuit protection for certain circuits was provided, that ConEd confirm that field verification of all heavy power cables and specific instrument loops had been conducted, and that selected control cables entering the CSR from the electric tunnel and switchgear room be walked down inside the CSR.

In Entergy's review of this issue they identified that they could not readily locate the supporting documentation related to these recommendations, as such, they initiated CRs-IP2-2004-01914 and 01932 to provide resolution of the conditions. The inspectors confirmed that the CRs properly addressed operability, and that there were no immediate operability issues. Also, the inspectors noted that Entergy added a corrective action to CR-IP2-2004-01914 to revise the plan for the DBI Project PI-10, Electrical Separation, to require the review of relocated or reconstituted documents from the Cable Separation Program to ensure that all open items have been addressed. Additionally, Entergy will include a review of the original justification for not conducting full field verification of all cables in the CSR during the Cable Separation Program.

Cable Separation Program Documents (Item b.)

The inspectors reviewed a concern involving a number of documents from the 1989 - 1995 Cable Separation Program activities that had not been approved, verified, checked and finalized, and that the records had not been entered into the document

management system. The inspectors also reviewed whether it was appropriate for Entergy's past or current DBI projects to use these documents as major sources of information in the development of the cable and raceway Design Basis Document (DBD). As such, this issue raises questions as to the validity of the document IP2-DBD-222, Design Basis Document for Electrical Separation, Rev. 1, December 17, 2003.

The inspectors noted that the cable separation reports reflected a very extensive program that included walkdowns, engineering evaluations and modifications. The purpose of this program was to determine the conformance of the installed plant cables with the applicable cable separation criteria as it was known, and use the knowledge gained from the walkdowns, performed by ConEd personnel, to further document the cable separation design criteria used during the construction of the plant. In addition to development of position papers as discussed above, TENERA was also used to perform an independent evaluation of the acceptability of ConEd analyses and corrective actions. In 1995 the Cable Separation Program ended with a number of activities remaining to be completed, such as, finalization of program documents and issues characterized by Entergy as "bulk data cleanup" items.

ConEd walkdown results and analyses of identified issues were contained in the cable separation reports and associated observation/comment/response forms (OCRs). TENERA documented their validation of ConEd activities in cable separation reports and cable anomaly resolution reports (CARRs).

Entergy has confirmed that selected documents were prepared, reviewed, and approved by TENERA, however, documentation of acceptance by ConEd has not been found. Entergy also found that these materials were not well controlled nor were they entered into ConEd's document management system. With regard to the impact that this condition would have on the DBD efforts at IP2, Entergy indicated that the cable walkdown information gathered by ConEd and the analyses activities of TENERA were only a part of the DBD effort. Although a number of the documents generated under ConEd's 1989 to 1995 Cable Separation Program were not fully controlled, the electrical separation DBD primarily relied upon documents that were validated and appropriately controlled. Where walkdown and analysis information could not be validated or verified (but was referenced), an open item flagged this in the electrical separation DBD. The inspectors noted that one such item flagged in the DBD is open item OI-ES-013, which requires that 21 cable separation reports need to be approved by Entergy's engineering group and final signed copies are needed.

Also, Entergy has included an action in CR-IP2-2004-01914 to better clarify the intent of the DBI Project PI-10 plan for the recapture or reconstitution of the ConEd and TENERA documents from the Cable Separation Program. Entergy, informed the NRC that the 18 page list of documents was an inventory of storage boxes and file cabinets containing existing cable separation program documentation as well as documents unrelated to that project. Also, Entergy was able to provide the inspectors cable separation reports Nos. CSR-001, 002, 003 and 004 that had been generated, reviewed and approved by ConEd as part of the review of installed cables in the 480 volt switchgear room during the Cable Separation Program. These cable separation reports were not listed in an

18-page "CSR" previously obtained by the NRC, which indicates that the number of cable separation reports generated as part of the Cable Separation Program is more extensive than those listed on the subject document.

The inspectors also concluded that some of the documentation for the ConEd walkdown and TENERA Corp. analyses information (e.g., cable separation reports, CARRS) were not properly controlled within the established ConEd quality assurance related procedures and drawing controls programs. ConEd procedure DB-S-15.201, Rev. 2, Electrical Separation Process and Interface Procedure, Step 5.1.2.f states in part..."When all reports for a given category of cables are complete, the Cable Separation Project Manager shall transmit all reports for that category to Records Management for microfilming and retention as part of the historical plant records."

The inspectors noted that DBI Project PI-10 has elements to reconstitute documents and disposition engineering recommendations related to separation anomalies and program elements. The failure to properly control the documents developed under the Cable Separation Program is a non-cited violation of 10 CFR 50,Appendix B, Criteria XVII, Quality Assurance Records (NCV 50-247/04-09-03, see Section b.2.c later in this report).

(2) Review of the Corrective Action Program implementation activities as they relate to the CRs written to address the resolution of the data anomalies

Summary:

As a result of reviewing this part of the unresolved item the inspectors determined that an extensive delay in resolving the identified Data Transfer Verification Report (DTVR) anomalies had occurred. A Green NCV was identified that involved an example of failure to comply with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, related to not providing a timely corrective action for a condition adverse to quality related to resolution of data anomalies associated with the WARS to ECRIS data conversion activities. Entergy has initiated appropriate corrective actions in its DBI Project on Electrical Separation to address the resolution of data anomalies. No concerns were identified by the inspectors in the implementation of the Employee Concerns Program (ECP) related to activities involving cable separation at IP2.

Details:

The inspectors reviewed Entergy actions related to the DTVR to assess whether the issue was being dealt with in an appropriate and timely manner by the engineering organization. In NRC Inspection Report 05000247/2004002, the NRC documented the results of licensee and NRC initial review of two CRs related to this concern. Specifically, CR-IP2-2002-07454 issued on August 1, 2002, was initiated to resolve the anomalies that may indicate some data quality issues; and, CR-IP2-2003-02665 was issued on May 5, 2003, due to the lack of progress on the resolution of the data anomalies. Subsequently, on June 23, 2003, both CRs were closed to engineering request ER-IP2-03-20601. This issue was entered into the ECP on September 16, 2003. On October 24, 2003 the Manager of Employee Concerns documented that based upon the investigation they performed the issue was substantiated, that the preliminary review of data discrepancies did not identify any immediate operability concerns, and no evidence was found that work to resolve the discrepancies had been done. Also, the ECP review concluded that most, if not all, of the data discrepancies may be the result of the differences between the WARS and ECRIS logic and the specialized cable separation criteria of IP2. However, there was also the potential that not all of the separation problems have been resolved and that ECRIS may have identified new problems. The inspectors noted that the characterization that cable separation is specialized at IP2 is related to the fact that the plant was designed and licensed to criteria that reflects early vintage plants. Simply put, ECRIS, which is used at other plants, is not readily compatible with IP2's specialized cable separation criteria.

The extensive delay in resolving the identified DTVR anomalies, were the result of numerous extensions of due dates with the engineering organization for the subject CRs, and the subsequent closure of the CRs to an engineering request. Entergy informed the NRC that these actions were based on confidence in the configuration of electrical cables in the plant and a lack of sensitivity of the engineering organization for allowing software and data errors to exist for an extended period. The ECP investigator found that further delay in implementing corrective actions was unacceptable because of: 1) the potential existence of some plant issues not previously known, and 2) the potential impact on designers working on plant modifications since May of 2002 without data anomalies in ECRIS having been resolved. The ECP investigator's actions resulted in October 2003 the initiation of DBI Project PI-10 to address the WARS to ECRIS conversion data anomalies. Additionally, the ER was re-graded so that appropriate resources could be applied. Also, the plan for DBI Project PI-10, Rev. 0 was subsequently reviewed in February 2003 and its scope was appropriately expanded. The expanded scope was to complete the development of the IP2 electrical separation criteria and, developed, to model appropriately the electrical separation criteria in ECRIS.

Based upon the inspectors reviews conducted in this area, no concerns were identified by the inspectors in the implementation of the ECP program related to activities involving cable separation at IP2.

The inspectors determined that, historically, Entergy Design Engineering failed to take ownership of the DTVR data anomalies and commit the necessary resources to

accomplish their timely disposition. The failure to implement timely corrective actions to address the DTVR anomalies associated with WARS to ECRIS data conversion activities is Example 2 of a non-cited violation of 10 CFR 50 Appendix B, Criterial XVI, Corrective Action (NCV 50-247/04-09-02, see Section b.2.b later in this report). This issue has been entered into the corrective action program as CR-IP2-2004-01059. The inspectors verified that the corrective actions have been included in the program and schedule of DBI Project PI-10, Revision I.

(3) Review of Entergy's process for reviewing the adequacy of cable separation for cables installed as part of modifications made to the plant subsequent to 1995; also recent identification of a cable not being installed to the latest criteria

Summary:

As a result of reviewing this part of the unresolved item the inspectors determined that appropriate actions are being taken by Entergy to provide additional review of cables installed since 1995 to ensure that the modification process provided the necessary controls to demonstrate that IP2 was meeting required cable separation design criteria. A Green NCV was identified that involved an example of a failure to comply with 10CFR 50, Appendix B, Criterion III, Design Controls, related to the use of dual fuses required for certain circuits specified in the engineering specification for design criteria for cable separation (NCV 50-247/04-09-01, see Section b.2.a later in this report).

Details:

As documented In NRC Inspection Report 05000247/2004002, the NRC performed its initial review in March 2004 of information provided by Entergy related to their review of modifications involving cables installed at IP2 subsequent to 1995. Entergy's initial review of cables installed subsequent to the 1989 to 1995 Cable Separation Program involved a population of 300 cables performed under CR-IP2-2004-01059, which was not well documented in terms of the nature of the review. Subsequently, Entergy performed a more detailed and better documented review of 329 cables, that resulted in the identification of one cable that was not routed in accordance with IP2 electrical separation criteria of record (documented in CR-IP2-2004-01922 and discussed below). During the current inspection, the inspectors performed additional reviews of Entergy's process for reviewing the adequacy of modifications made to the plant subsequent to 1995, and their efforts to address design deficiencies identified.

Entergy provided the inspectors with a summary of the review of cables that were performed under engineering request ER-IP2-04-18159, which they called the Group I effort. This summary document detailed the formal documented review for the 329 cables that were selected at random from the cables involved in modifications performed subsequent to the 1989 to 1995 Cable Separation Program. The review criteria used to evaluate each cable included considerations that would ensure that the route selected by the electrical designers was consistent with the IP2 electrical separation criteria of record (e.g., compatible channel-train assignment, electrical separation, voltage level separation, and Class A protection provided where required by criteria). The process provided for two individuals to independently perform the review, namely an electrical design engineer and the cable separation subject matter expert.

The cables reviewed included those that involved new cable installation, existing re-routed cables, or conductors within a cable being changed to different functions. Any cables that were found to not meet the specified requirements received further review and a CR was written if necessary. Nine cables required further review, of which one cable did not meet the IP2 electrical separation criteria of record and was the subject of CR-IP2-2004-01922.

The cable that was the subject of CR-IP2-2004-01922 (cable JA9-JG7/01) provides instrument bus power to the A6 rack in the control room and was installed by modification FPX-96-12153-F. The electrical separation criteria for IP2 allows circuit-by-circuit routing of cables, for those designs where the power supply and the routing channel may be from a different safety train. In this case, the modification involved the power being supplied from the vital train A (red) Instrument Bus 21 and the power supply cable was installed in a channelized train C raceway (blue) D400. This modification was issued with a single Class A protection device (fuse) for this cable. The cable was not routed in accordance with the current IP2 electrical separation criteria that provided enhancements for a category of cable separation know as "power supply/channel mismatch." The present criteria specified in engineering specification EI-2031, Rev. 0, Design Criteria for Cable Separation At Indian Point No. 2, requires that the circuit in question be double fused or further evaluated by engineering to verify that minimum required safeguards equipment would not be compromised by a single failure.

Entergy's review of this circuit determined that it was not double fused and there was no engineering evaluation justifying this design. The inspectors reviewed CR-IP2-2004-01922 and noted that the end device of the cable is Rack A6 in the control room, which is both quality related and a seismic qualified panel. Therefore the failure of this end device would constitute the single failure and the additional failure of an upstream protective device would not be postulated. While Entergy has provided a basis in the CR as to why the as-found condition for the protection of the subject cable was acceptable, they have generated a corrective action as part of the CR to determine if the design of the circuit should be enhanced. The NRC has determined that the failure of the licensee to ensure that modification FPX-96-12153-F met the requirements of engineering specification EI-2031, Rev. 0, Design Criteria for Cable Separation at Indian Point No. 2, is Example 1 of a non-cited violation of 10 CFR 50, Appendix B, Criteria III, Design Controls (NCV 50-247/04-09-01, see Section b.2.a later in this report).

Based upon the NRC observations during field walkdown activities involving cables running (i.e., hopping) between separate channels in a cable tray, the inspectors were concerned about the need for a timely and comprehensive review of post-1995 modifications to ensure that the modification process provided the necessary controls to demonstrate that IP2 was meeting required cable separation design criteria. During an onsite discussion on cable separation on April 27, 2004, Entergy informed NRC Region I management that the DBI Project PI-10 Rev 1 schedule would include revised plans to address the completion of the cables installed since 1995. The inspectors reviewed DBI Project Plan PI-10, Rev. 1, schedule dated July 12, 2004, and confirmed that the review

activities associated with the remaining cables is scheduled to be completed by October 6, 2004.

(4) Review of the identification of attributes to be examined and criteria to be used in cable tray walkdowns aimed at detecting potential cable configuration control conditions that could adversely affect cable separation

Summary:

As a result of reviewing this part of the unresolved item the inspectors performed additional field walkdowns, which resulted in identifying cables hopping between separate channels in a cable tray located in the cable spreading room. Engineering analysis by Entergy demonstrated that the faulted conditions occurring in the cable that hopped between channels in the cable tray could not cause damage to the cables in the cable tray. Also, Entergy has identified corrective actions to further review past judgements related to the extent and nature of field walkdowns performed in the cable spreading room as part of the Cable Separation Program. The inspectors determined that Entergy has an appropriate plan and schedule to conduct cable tray walkdowns that are aimed at detecting potential cable configuration control conditions that could adversely affect cable separation.

Details:

The inspectors performed additional walkdowns of cable trays to assess plant conditions related to the installation and separation of cables. The need to conduct further walkdowns of cable trays by Entergy resulted, in part, from an inspector identified condition involving cables hopping between separate channels in a cable tray in March 2004, as documented in NRC Inspection Report 05000247/2004002.

During an NRC walkdown on May 27, 2004, the inspectors identified another condition involving the hopping of cables between channels K1 and K2 in cable tray T-45B/K1/K2 located in the east end of the cable spreading room. These channels are used to route cables that are characterized as small power and control cables. The immediate corrective action was to have the cables involved in the hop placed in their proper routing channel. This condition was documented in CR-IP2-2004-03275. The CR provided the results of engineering evaluations that indicated that while the cables by design were not intended to hop between the channels, operability of the suspect cables located in the redundant channels of tray T-45B/K1/K2 was maintained because they met the current electrical separation criteria for cables that do hop. Entergy performed a failure modes and effects analysis for the suspect cables and used acceptance criteria that was used to accept similar conditions found during the Cable Separation Program. For the suspect cables, the analysis demonstrated that the affected cables during faulted conditions would not be subject to sufficient energy to cause damage to these cables. Also, the inspectors noted that this cable hop was in a tray section in the cable spreading room which was not walked down during the Cable Separation Program, but rather was enveloped by the type of condition evaluated in Cable Separation Report CSR-111, Position Paper on Cable Spreading Room Field Verification. CR-IP2-2004-03275 included an activity to be incorporated in the DBI PI-10 project to assess the impact of this issue on the review, closure and acceptance of the CSR-111 Position

Paper on Cable Spreading Room Field Verification. Also, this finding provides further evidence of the need for Entergy to complete the walkdown of cable trays at IP2.

The inspectors also reviewed a guideline document that was in development that would be used to control and provide critical attributes for the cable tray walkdown inspections conducted both inside and outside containment. The critical attributes to be used during the Phase I walkdown of the cable trays included: dividers in place as identified on drawings, barriers at designated locations are in place, verification that no temporary cables or equipment are in trays, verification that no cable splices are in the trays, verification that there are no cables hopping the divider, and that cables are restricted to sizes appropriate for the tray. Phase II walkdowns would review the cable trays for non-critical attributes, such as schematic and physical drawings match field conditions, blankets in use have not degraded, and cable layout is appropriate within trays. The inspectors considered the walkdown attributes to be appropriate, and their use in controlling the walkdown process would provide for a consistent approach to document field conditions. The inspectors reviewed the Project PI-10 schedule information which indicated that the Phase I walkdown was scheduled to be completed by December 21, 2004. The schedule to conduct the Phase II walkdown of cable trays for the non-critical attributes was in preparation at the time of the inspection exit meeting.

(5) Review of the acceptability of the use of dual fuses at IP2 to provide electrical independence in lieu of physical separation for cables;

Summary:

As a result of reviewing this part of the unresolved item the inspectors interfaced with the Office of Nuclear Reactor Regulation (NRR) to address the acceptability of the use of dual fuses at IP2. The results of the NRR review will be tracked by unresolved item (UNR 50-247/04-09-04). Additional reviews were conducted to address an issue that the use of dual fuses does not provide for the protection of cables from events involving fire, seismic, or pipe rupture/missiles. Other issues reviewed by the inspectors included using mitigation approaches such as the use of thermal separation blankets and/or engineering analyses in lieu of physical separation of cables. No inspection findings or inspector concerns were identified by the inspectors in reviewing the latter two issues as they relate to the installed cable separation configuration at IP2.

Details:

To address the acceptability of the licensee's use of dual fuses for providing electrical independence, Region I interfaced with the Office of Nuclear Reactor Regulation (NRR) to request a determination of the following issues: (1) Does reliance on two protective devices in a non-safety circuit (installed to ensure that an overload or fault will not cause the circuit cables to exceed their thermal limits) provide independence between redundant safety systems?; and, (2) Pursuant to 10 CFR 50.59, should the licensee have obtained a license amendment prior to implementing the change (i.e., relying on protective devices as a substitution for physical separation)? The acceptability of the use of dual fusing at IP2 is unresolved pending the completion of this NRR review. **(URI 50-247/04-09-04)**

In addition to the inspectors' questioning the acceptability of the licensee using dual fuses in lieu of physical separation, the NRC reviewed whether this approach will protect the cables from events involving fire, seismic, or pipe rupture/missiles that could destroy cable trays that contain redundant train cables. These events are principally addressed by NRC regulations that relate to postulated events involving fire (e.g. 10 CFR 50.48 and Appendix R for fire protection), seismic, or pipe rupture/missiles and the original plant design basis applicable at the time the plant was licensed. Also, the inspectors noted that evaluations and assessments performed by ConEd engineering contractor - TENERA as part of the 1989 - 1995 Cable Separation Program, included the review of pipe rupture/missiles in a number of areas of the plant. Specifically, TENERA reviewed the adequacy of cable separation in containment against accident generated missiles and the protection of cables in the cable spreading room from missiles generated by the failure of flywheels on motor generator sets 21 and 22. The documents reviewed were draft reports submitted to Indian Point in 1992 and 1996, respectively. The inspectors determined that the installed cable separation configuration at IP2 meets regulatory requirements in regard to the related concerns expressed to the NRC. However, confirmatory activities of the DBI Project PI-10 program remain to be completed to ensure that all applicable licensee and contractor reports and verifications of recommended actions were complete and accurate. The NRC will continue its review of this aspect of the DBI project.

Additionally, the NRC reviewed the issue of providing electrical independence in lieu of physical separation of cables that related to other mitigation approaches such as the use of thermal separation blankets and/or engineering analyses. The inspectors reviewed past NRC inspection reports related to reviews conducted regarding the licensee's implementation of their Cable Separation Program. Inspection Reports 50-247/89-12, 91-81, and 93-18 documented the NRC review of selected program activities. These inspections acknowledged that engineering analyses were performed (including circuit-by-circuit analysis) and that blankets were one of the methods being used as an enhancement to resolve cable separation anomalies that had been identified. In IEEE Standard 384-1977, Criteria for Independence of Class 1E Equipment and Circuits, guidance is provided to the industry on the concepts of shielding and electrical isolation in addition to physical separation. This document discusses how separation can be addressed use of barriers and by use of analysis in areas where the damage potential is limited to failures or faults internal to the electrical equipment or circuits. Also, the inspectors noted that most IP2 cables are fire retardant asbestos jacketed. Newer cables used in the plant are qualified to IEEE Standard 383-1974, Type Test of Class 1E Electric Cables, Field Splices and Connections for Nuclear Power Generating Stations, which provides additional protection against cable faulting induced fires in the cable trays in addition to the protection afforded by the installed blankets.

(6) Review of the software and/or administrative controls used in the implementation of the WARS software program and database, and the extent that WARS data is either missing or inadequate:

Summary:

As a result of reviewing this part of the unresolved item the inspectors determined that Entergy, and its predecessor ConEd, did not have formal procedures or controls for maintaining and upgrading WARS software. The ECP was instrumental in raising the prioritization for resolving the DTVR anomalies. The inspectors conducted an assessment of the DTVR anomalies and determined that they represent missing and inaccurate data in WARS and discontinuities between the IP2 cable separation design basis and the original ECRIS logic. The inspectors determined that these conditions do not constitute a safety system operability concern for installed cables since the licensee's cable separation processes are manual systems and do not directly rely on the WARS or ECRIS databases. Furthermore, none of the anomalies reviewed by the inspectors identified operability issues or improper cable separation. The inspectors determined that training on the use of WARS was not provided to engineers and designers in a timely or systematic manner prior to the termination of the use of WARS in May 2002, and that subsequent to 1996 new engineering personnel performing modification activities involving the design and installation of cables had to rely on on-the-job training. The NRC will follow the resolution of the DTVR anomalies as Entergy completes the DBI Project PI-10 activities.

Details:

Controls Used in Maintaining and Upgrading WARS Software Program and Database:

The inspectors reviewed the controls used in maintaining and upgrading WARS. Entergy stated that WARS was not subject to software quality assurance requirements; however, the development of WARS logic, updates to that logic and data entry were all subject to licensee review and oversight. They also stated that there were process controls over WARS data. The inspectors determined that IP2 personnel lacked full knowledge of the history of changes to WARS and did not provide any formal procedures or controls for WARS. The inspectors also concluded that upgrades to WARS were based on informal discussions between the IP2 engineering staff and the WARS software contractor. The licensee relied upon the software contractor's change process to provide any changes to WARS. Entergy acknowledged that they had no formal procedures or controls applicable to the WARS software, and stated that the contractor made the changes to the software using a separate test database, tested the proposed change, and modified the design as necessary. The contractor had another designer, who acted for many years at IP2 as the Data Base Manager of WARS, conduct testing of the proposed change. Plant personnel then had the opportunity to test and comment on the proposed modification. Subsequently, the production software and databases were backed up, new software was installed on the plant system, changes were made to the WARS manual and, for significant changes, training classes were conducted for WARS users.

The inspectors were able to obtain information from the WARS contractor about the changes made to the WARS software. The inspectors selected a change made to the WARS program related to the capability for the program to automatically generate the exterior colors to be taped around the cable, which was based upon the channelization of the trays through which the cable was routed. The inspectors confirmed that the

subject modification to the WARS software was incorporated into the WARS Quick Reference Guide that was used by the electrical designers.

Missing or Inadequate Data in WARS and Review of the Data Transfer Verification Report (DTVR):

To assess the extent to which the data in WARS is either missing or inadequate, the inspectors interviewed the Entergy cable separation subject matter experts; a contracted software engineer for ECRIS (Engineering Planning and Management or EPM) who prepared the DTVR; several IP2 electrical designers and engineers who have worked with WARS and ECRIS; and the Employee Concerns Program (ECP) investigator responsible for the DTVR investigation conducted by Entergy. The inspectors also reviewed the DTVR assessments that were performed by the licensee and the ECP investigator. Finally, the inspectors independently reviewed the DTVR, including the data configuration/reconfiguration flow charts, data reconfiguration requirements specification, and the list of anomalies. The DTVR was the result of converting WARS, to the more widely used ECRIS being used at other Entergy plants. During each step of the conversion any data that were inconsistent with the ECRIS logic model or data requirements were entered into the DTVR as "anomalies" for resolution.

The licensee's cable separation experts indicated that data anomalies occurred as a result of the WARS to ECRIS conversion based on ECRIS logic. They also acknowledged the existence of a large number of data errors in WARS. This was considered by them not to be a concern because the nature of the errors was not vital to the use of WARS, and that they considered WARS an aid to be used as part of the modification process. Because WARS and ECRIS are not relied upon in the manual cable routing process at IP2, the cable separation experts had confidence that the DTVR anomalies were not indicative of actual cable separation issues. An ECRIS contractor explained the DTVR creation process and the extensive DTVR documentation that was generated. The IP2 designers and engineers were in general agreement that WARS had been a valuable tool to aid them in developing the design modification drawings (DMDs) that acted as cable routing schedules needed to install cables at the plant.

The inspectors noted that the ECP investigator activities conducted to address concerns raised about the WARS to ECRIS conversion process produced extensive and thorough marked-up plant drawing and walkdown documentation describing the review of the DTVR and the routing of cables in the plant. The inspectors found that the ECP investigation selected an appropriate sample of items from the DTVR to review based on the scope of the investigation. The investigation researched 83 items from the five most safety significant categories, which resulted in full explanations for many generic issues. The ECP investigator concluded that he found no operability issues, that there were several generic issues that appeared to affect a significant portion of the listed electrical separation anomalies, and that he did not consider additional reviews necessary in light of the insights learned from his preliminary review. However, he did note that there was a potential for issues to have been introduced in the time period when ECRIS was used with known, unresolved anomalies. His conclusions were

instrumental in raising the prioritization for resolving the DTVR anomalies and were consistent with the NRC inspectors' assessment.

Entergy's assessment of the DTVR documented in CR-IP2-2004-01059 states that the anomalies were divided into 6 categories, each category was reviewed, and the determination was reached that the anomalies were due to conversion errors and the ECRIS logic. The inspectors noted that the ECRIS contractor submitted a proposal on October 15, 2003, to address 1) deficiencies in the ECRIS logic; 2) the electrical separation anomalies; and 3) remaining data anomalies. These proposals were incorporated into the Project PI-10, Rev. 0, which was approved on October 24, 2003. In demonstrating its commitment and evidence of progress in implementing the Project PI-10, Entergy provided the inspectors with the Software Requirements Specification SRS-P1643-001, ECRIS Cable Separation Requirements. This specification defined the technical requirements and modifications for ECRIS to reflect the required cable separation criteria of IP2. The inspectors found that Entergy's assessment failed to properly identify all the significant causes of the data anomalies. Specifically, the assessment did not include missing and inaccurate data that is contained in WARS as one of the causes for the large amount of data anomalies.

The inspectors reviewed all 27 categories of the DTVR and determined that the significant causes of anomalies include: 1) missing/inaccurate data in WARS (such as, number of conductors in a cable, safety classification, and cable route), 2) conversion errors where data was available in WARS but the conversion program was not adequately designed to retrieve the information, 3) logic errors where ECRIS did not "understand" the IP2 specific cable separation design criteria, 4) data in transitional states (e.g., cables in process of design therefore only partially entered into the database), and 5) data from Indian Point Unit 1 which shares some equipment with IP2, but uses different naming conventions, which the conversion program was unable to process.

The inspectors determined that the DTVR represents potential data errors which may reduce confidence in the database but do not necessarily relate to installed plant conditions. For example, cable AJ2-PL2 is a non-safety cable that was incorrectly entered into WARS as a safety cable. Consequently, the DTVR flagged this cable for being in trays that a safety cable should not be; but because the cable was actually non-safety the routing is appropriate. Instances of incorrectly recording whether a cable is safety or non-safety may reduce confidence in the quality of the database; however, no instances were found that related to installed plant conditions. Conversely, JA6-JG7/01 is a cable that was not routed in accordance with the current IP2 electrical separation criteria as discussed previously in this report. This cable shows up in the DTVR and does accurately reflect plant conditions (although, as previously documented, this is not an operability concern). Also, numerous cables such as AI5-PL2 contain routes which appear to have excessive hopping due to unresolved issues contained in the bulk data cleanup program. In all cases reviewed, none of the anomalies reviewed by the inspectors revealed actual operability issues caused by improper cable separation. Once those elements of DBI project PI-10 are accomplished to address the data

anomalies, a new DTVR will be created that will reflect the need to evaluate each anomaly.

Regarding the issue of electric cable raceway overfill, the inspectors sampled several anomalies by performing walkdowns throughout the accessible areas of the plant, and concluded that cable raceway overfill problems are not as widespread as the DTVR suggested and neither the WARS nor ECRIS raceway fill calculations generated by the programs are indicative of actual overfill conditions. Additionally, Entergy engineering personnel stated that raceway fill calculations are done manually and WARS and ECRIS are not relied upon to perform raceway fill calculations as part of engineering activities at IP2.

WARS and ECRIS are used as an aid in the manual cable routing process. Although the DTVR reflects missing and inaccurate data in WARS and conflicts between the IP2 cable separation design basis and the original ECRIS logic, this does not constitute an operability concern for routing cables since the licensee's manual processes do not rely on the WARS or ECRIS databases. WARS and ECRIS provide the only tool capable of generating cable schedules for IP2, and as such are useful as long as engineers and designers are sensitive to the inaccuracies in the data. The resolution of the DTVR anomalies lies in Entergy completing the DBI Project PI-10 activities which will include impact reviews of plant changes and any engineering analyses that may have used WARS or ECRIS data. The NRC will sample the revised DTVR in a future inspection.

Manual Routing of Cables

The NRC reviewed the capability of engineers and designers at IP2 to manually route cables in the plant given the unique and confusing separation design basis, and to assess the degree to which WARS was relied upon for defining and confirming all cable routes. Based upon interviews with the licensee contractor for WARS (Kinetic Decisions), and designers and engineers at IP2, the inspectors determined that WARS was not capable of defining cable routes (i.e., the WARS system did not have the capability to automatically generate a cable route), but it was used as an aid in the design control process to confirm cable routes by comparing the proposed cable route entered by the designer with the established cable separation criteria for the plant contained within the WARS programing.

To further assess designer and engineering capabilities, the inspectors reviewed licensee activities that provided training to engineering and design personnel on the understanding and use of electrical separation design criteria at IP2, and what training these individuals received on the use of WARS. Information provided by Entergy indicated that the last training of record for engineering personnel in this area was accomplished in the 1995-1996 time frame. This training was contracted by IP2 Design Engineering to a contractor (TENERA), and was attended primarily by engineers and designers. The course was offered three to four times during that time frame. The course content included understanding channel compatibility, understanding electrical separation design criteria, and how to use electrical separation design criteria. Some of the designers interviewed remembered the training, or had been provided the training

material. Designers were familiar with the WARS quick reference guide that was provided by the WARS contractor, and one designer indicated the guide was updated after changes were made to the WARS program. One of the three electrical designers interviewed acknowledged that he had received direct training given on the use of WARS by its contractor after a change was made to the program. Related to this issue was the licensee-identified need to conduct training on capabilities of the WARS program, as identified in CR-IP2-2001-01087. This condition was identified as a result of concerns on how WARS was used during the design of the electrical tunnel ventilation exhaust fan modification (the design control aspects of this modification are discussed in Item 7 later in this report). Specifically, it was identified in early 2001 that the training module for WARS was in need of review to ensure that cable separation and its application within WARS is adequately taught to the technical staff involved in cable routing. However, this training was never accomplished. This failure to perform timely training about WARS and its use was viewed by the inspectors as a contributor to the apparent misunderstanding that some of the Entergy engineering staff had about the use of cable color coding in WARS, which may have fed the perception that cables were designated the color black due to a lack of knowledge on the part of engineering design staff on how to route cables.

The inspectors determined that training on the use of WARS was not provided to engineers and designers in a timely or systematic manner prior to the termination of the use of WARS in May 2002. Subsequent to 1996, new engineering personnel performing modification activities involving the design and installation of cables had to rely on on-the-job training involving design change process documents, design basis documents, electrical specifications, and contacts with subject matter experts to develop their skills in electrical separation design criteria at IP2. The inspectors also identified a concern that there was no formal requirement in the design control process for the need to consult a subject matter expert in the area of cable separation as an appropriate means to ensure that requirements were understood and met. This matter is further discussed in Section 7 later in this report.

(7) Review of the adequacy of design controls used to ensure proper electrical cable separation, including the adequacy of drawings and equipment identification tags used to ensure adequate configuration control:

Summary:

As a result of reviewing this part of the unresolved item the inspectors confirmed that the design process relies on manual engineering design methods to ensure that the routing of electrical cables results in the proper cable separation. The inspectors determined that the belief held by Entergy that WARS allowed the users the flexibility of bypassing the color scheme and WARS cable separation checks was not correct. The inspectors found that raceways were marked and drawings were generally accurate. However, a Green NCV involved three examples of failure to comply with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, related to not providing timely corrective actions for conditions adverse to quality related to updating cable raceway drawings, and conducting necessary training on the use of the WARS system (NCV 50-247/04-09-02, see Section b.2.b later in this report). While engineering personnel at IP2 indicated

that they do not rely on the calculational or related features of the WARS/ECRIS programs in engineering activities in engineering activities performed at IP2, such as Appendix R safe shutdown re-analysis, the inspectors have found some reliance on the WARS data in engineering calculations and assessment of issues (such as CRs) without design control procedures and processes being in-place to control these activities. Also, the inspectors identified a concern involving the design controls established for modification activities did not require the use of an electrical separation subject matter expert, even though the electric cable separation design requirements at IP2 are of a unique and complex nature. A Green NCV was identified that involved a number of examples of failure to comply with 10 CFR 50, Appendix B, Criteria III, related to design control deficiencies involving the failure to update an ampacity calculation, the use of the non-QA WARS database in plant calculations, an inadequate design review caused by not requiring a cable separation subject matter expert review as part of the modification review process, and failure to ensure that design requirements are properly translated into installation procedures (NCV 50-247/04-09-01, see Section b.2.a later in this report).

Details:
In reviewing design controls at IP2, the inspectors were again informed that Entergy's modification design process relies on manual methods to ensure that the routing of electrical cables results in proper cable separation. The methods include use of design information in electrical specification EI-2031, Design Criteria for Cable Separation at Indian Point No.2, the performance of plant walkdowns using design drawings, and the manual generation of a DMD using ECRIS (previously WARS). The manually generated DMD becomes the final quality record following review, approval and signature of qualified electrical design engineering personnel. The WARS (now ECRIS) system performed a check of the cable routing entered into the system to identify any routing that was not consistent with the program's logic (i.e., not consistent with the cable separation requirements). However, this computerized routing check was intended to only be an aid to the engineers and designers, with the manually-generated reviewed and approved DMD being the official design record.

The inspectors found that design controls were generally consistent with the above stated position. Cable routing was inherently a manual process since the WARS system did not have the capability to automatically generate a cable route. Once a cable route was entered into WARS, the program would check for, and flag, any separation violations. The inspectors also noted that WARS would specify a cable color based on the channel designations of the raceways in the selected routing, if the designer enabled this feature in WARS.

The inspectors found that some designers did not have a good understanding of how or why colors were used in WARS, which would later lead to misunderstandings that personnel had about the relationship between colors and routing information contained in WARS. Entergy initially stated that "The WARS program does not perform separation checks for cables that are not color coded." The inspectors determined that WARS did not provide the ability for electrical designers to designate the color of cables and thereby bypass the routing verification checks performed as part of using the WARS

program to develop the DMD. The DMD is used as a cable schedule in the installation of a modification at IP2. The inspector learned that the use of color coding as part of the Cable Separation Program and its inclusion in WARS was instituted at IP2 in 1995 by ConEd. The purpose of this enhancement as part of the Cable Separation Program was to provide an aid to assist engineering personnel in the visualization and identification of "Trains" for the various safety systems installed at IP2.

The inspectors performed plant walkdowns during both the March and May inspections to assess the overall condition of the electrical raceway and cable installations. The inspectors specifically looked for the existence of cables crossing between redundant cable trays or separated tray sections (cable hops), the existence of cable tray overfills and the extent to which cable trays and conduits were labeled. During the walkdowns the inspectors identified two examples where cables routed in cable trays crossed from one safety train to another in violation of the electrical separation criteria. The first example was identified during the March, 2004 inspection and was discussed in section 1R15 of IR 05000247/2004002. The second example, which was identified during the current inspection, involved the hopping of cables between channels K1 and K2 in cable tray T-45B/K1/K2 located in the east end of the cable spreading room (documented by Entergy in CR-IP2-2004-03275). In both cases the cable routing was immediately corrected and the potential impact of the cable hops was evaluated by Entergy. The follow-on evaluations concluded that the hops did not result in operability concerns for the cables contained in the affected cable trays. In addition to immediately correcting the problems, the DBI Project PI-10 program includes actions to perform additional walkdowns of raceways to identify and resolve any additional cable routing issues. The two examples described above are failures to ensure that electrical cable separation design requirements were translated into installation procedures to avoid cable installation errors, and are Examples 2 and 3 of a non-cited violation of 10 CFR 50 Appendix B, Criteria III, Design Control (NCV 50-247/04-09-01, see Section b.2.a later in this report).

Based on information obtained during interviews and plant walkdowns, the inspectors found that raceways were marked and drawings were generally accurate. These observations were consistent with the interviews held with Engineering department personnel, who indicated that design drawings and raceway markings were generally good and that they did not routinely encounter problems in these areas. However, there were two issues identified during the interviews conducted by the inspectors that involved drawing inadequacies. These issues involved train/channel designations on tray markings and associated drawings that were known to be incorrect by licensee personnel and had not been corrected. The first issue involved modification FIX-95-10935-1, which replaced the electrical tunnel ventilation exhaust fan controllers during the year 2000. In preparation for installing new cables for this modification, the installers noted that the DMD specified cable colors as both red and white. Red is the designation for a train A cables and white is associated with train B cables. Having the cable designated as trains A and B was an obvious error and engineering was consulted and corrected the DMD prior to implementation of the modification. The cause of the problem was that certain cable trays in the routing were improperly designated as both train A and B raceways, resulting in WARS automatically assigning two colors. At that

time, actions were taken to modify the WARS program to prohibit use of the affected raceways until the issue with the dual train designation had been resolved. A CR was initiated after the event and identified several corrective actions. One action was to correct the associated raceway drawings and another was to conduct additional WARS training. The inspectors found that these actions had not been completed and the raceway design drawings, utilized for modification work, continued to be in error. The failure to implement the corrective actions described above are Examples 3 and 4 of a non-cited violation of 10 CFR 50 Appendix B, Criteria XVI, Corrective Action (NCV 50-247/04-09-02, see Section b.2.b later in this report). This issue was entered into the corrective action program as CR IP2-2004-02693.

The second issue identified during interviews was described as the need to correct several issues described as "bulk data cleanup." For example there is a cable tray in the switchgear room that is identified as train D-K1, with D being a non-safety designation and K1 being a train A designation. However, the tray currently only contains Train C cables and therefore should have been designated as a D400 tray. This condition has existed since the time of the Cable Separation Program and at the time of this inspection the issues had not been corrected (e.g. raceway drawings not corrected) and no condition report had been written. CR-IP2-2004-02572 has now been written and documents a list of eleven items to be evaluated and dispositioned. The failure to promptly identify and correct these conditions involving drawing accuracy is Example 5 of a non-cited violation of 10 CFR 50 Appendix B, Criteria XVI, Corrective Action (NCV 50-247/04-09-02, see Section 2.b.2 later in this report).

The inspectors reviewed the use of WARS/ECRIS in engineering activities performed at IP2. The types of activities reviewed included Appendix R safe shutdown analysis, cable tray fill assessments, cable tray weight loading calculations, and ampacity calculations. Engineering personnel at IP2 indicated that they do not rely on the calculational features of the WARS/ECRIS programs, such as voltage drop, and tray fill. Review of engineering activities in the area of cable tray weight loading, determined that the engineers perform hand calculations that assume 100 percent tray fill to compute the tray loading and adequacy of the tray supports. Specifically, the inspectors reviewed Calculation No. IP-CALC-04-00656, dated May 27, 2004, Cable Tray Evaluation and Documentation. This calculations specified that a walkdown of the plant was performed and noted that a majority of the cable tray supports are lightly loaded. However, the inspectors determined that data from the WARS/ECRIS systems have been used (e.g., Appendix R and ampacity calculations). While no concerns in the area of Appendix R (which is discussed later in this item) were identified, the inspectors found one instance where an engineer relied on WARS data in performing an ampacity calculation (discussed later in this item).

The inspectors reviewed the Entergy evaluation of the impact of DTVR issues on DBI project to perform an Appendix R re-analysis. This evaluation was documented in CR-IP2-2004-01059 Corrective Action 5. The Appendix R re-analysis evaluates cables to ensure they are separated as required to meet safety train separation on a fire area basis and thereby ensure safe shutdown can be accomplished for a fire in any particular fire area. The WARS database did not identify which fire area(s) were associated with

the location of a raceway, and therefore could not be used to do Appendix R safe shutdown analysis. During the current Appendix R re-analysis, plant drawings are being used to determine which cables were associated with the safe shutdown components. Although ECRIS data is used to identify the cable routing, the licensee then uses the cable tray and conduit drawings to trace the routing of the cables and identify which fire areas the cable have been routed through. Based on this review, and the results of the NRC triennial fire protection inspection, the inspectors concluded that the DTVR issues would not adversely affect the Appendix R re-analysis. Also, the inspectors noted that the Appendix R re-analysis effort was effective in identifying two issues (Licensee Event Report 2003-001) using the ECRIS program that were not previously identified during the original safe shutdown analysis. These issues involved a failure to ensure safe shutdown equipment was properly separated by rated fire barriers (charging pump control and service water pump power cables). The NRC review of these issues is documented in Inspection Report 50-247/2004005.

The inspectors reviewed cable ampacity calculation ECX-00012-00 which was issued in 1993 to evaluate cables in a cable tray which appeared to exceed tray fill criteria. During this review the inspectors noted that a cable was subsequently added to the tray section evaluated in the calculation, but the calculation was not updated to assess the impact of the new cable. CR-IP2-2004-03211 was written to document this issue. Additionally, the inspectors found that the calculation uses cable lists and tray dimension information from the WARS database. Also, recent CR evaluations have used the WARS data when assessing issues associated with cables and raceways. The inspectors found that design control procedures and processes did not provide guidance or procedures on the use of WARS or ECRIS in engineering activities. The WARS database was not subject to appropriate quality controls, and should only have been used as a design aid. The failure to update the ampacity calculation following the addition of a cable to the raceway and use of data from a Non-QA database in plant calculations are Examples 4 and 5 of a non-cited violation of 10 CFR 50 Appendix B, Criteria III, Design Control (NCV 50-247/04-09-01, see Section b.2.a later in this report). This issue has been entered into the corrective action program as CR-IP2-2004-03487. Also, the inspectors noted that Entergy's DBI project PI-10 has included a task to review the impact of data changes on engineering products to ensure that data anomalies have not adversely affected engineering decisions.

Based on the complex nature of the Indian Point 2 electrical separation design, the inspectors reviewed the use of subject matter expert reviews during the modification process to ensure compliance with the design criteria. The inspectors found that personnel with sufficient knowledge of cable separation requirements were available, but the design process and procedures did not consistently ensure sufficient involvement to prevent errors similar to those experienced during the electrical tunnel ventilation modification discussed above. Additionally, electrical specification EI-2031 contains a checklist (Appendix K) which provides guidance on cable separation. This guidance is referenced in the design input procedure DE-S-12.613 but was not consistently utilized by design engineering personnel, nor were all design engineers familiar with the document. The failure to provide for appropriate independent review of separation requirements during modifications and the failure to ensure the consistent

use of the Appendix K checklist by design engineering personnel are Examples 6 and 7 of a non-cited violation of 10 CFR 50 Appendix B, Criteria III, Design Control (NCV 50-247/04-09-01, see Section b.2.a later in this report). The inspectors noted that Entergy's DBI Project PI-10 includes a task to review various aspects of the design change process used to address electrical separation criteria.

(8) Review of Entergy's schedule for the implementation of DBI Project PI-10:

Summary: The inspectors have determined that Entergy has developed appropriate plans and a schedule to address the DBI Project PI-10 to facilitate their final assessment of plant conditions related to cable separation at IP2. This assessment took into consideration the very low safety significance of actual plant issues affected by discrepancies and violations. This schedule has included the need for timely addressing activities, such as, modifications reviews and plant walkdowns as they relate to cable separation concerns.

Details:
The inspectors determined that the completion of the DBI Project PI-10 actions are necessary for Entergy to make a final assessment of the extent of any actual cable separation issues in the plant, and to more fully evaluate to what extent configuration and design control issues have contributed to problems identified.

Entergy provided the inspectors with a copy of the DBI Project PI-10 implementation schedule on May 19, 2004, and an updated schedule was provided on July 12, 2004. The inspectors were informed by plant personnel involved in the DBI Project P10 that as a result of the identification of additional issues, such as the resolution of items characterized as bulk data cleanup that is in CR-IP2-2004-02572, there would be a need to update plans and schedule for this project. In a July 29, 2004 letter to the NRC, Entergy stated that the schedule for the DBI Project PI-10 has been extended until second quarter of 2005 to accommodate additional tasks. The inspectors found that the schedules included the appropriate items needed to address cable separation issues identified at IP2.

(9) Review of the willingness of IP2 staff to bring cable separation issues to management's attention.

Summary: The inspectors did not identify any instances of reluctance on the part of Entergy staff to report cable separation issues to management.

Details:
During interviews conducted with several members of the IP2 staff, the inspectors did not identify any instances where a staff member indicated reluctance on their part to report cable separation issues to management. Additionally, the personnel interviewed did not express any concerns that anyone they worked with would be reluctant to raise issues associated with cable separation. The inspectors also interviewed an employee who had written an e-mail which raised questions relative to the willingness of individuals to raise cable separation issues to plant management. During this interview

the employee did not identify any specific instances where actual issues were not raised to management. The employee indicated that his statements were made during a period of time (while ECRIS was being developed) when he was advocating implementation of previously identified improvements to the WARS program. The statements reflected his concern that failing to implement the improvements could be a missed opportunity to take actions that may prevent future cable separation issues. This individual was concerned that should future issues arise, it then would be difficult for someone to explain to management how they occurred in light of the significant resources that were expended in the cable separation program from 1989 to 1995.

b.2 Non-Cited Violations

This section provides a disposition of the violations discussed in the above report sections.

b.2.a Introduction. A Green NCV was identified for the failure to adequately implement the design control requirements of 10 CFR 50, Appendix B, Criterion III, during electrical design activities involving electrical cable and raceway configurations.

Description. During the review of electrical separation concerns the NRC identified several examples where design controls were not adequate.

Plant modification FPX-96-12153-F, which included the installation of cable JA9-JG7/01, did not comply with the requirements of Engineering Specification EI-2031, Rev. 0, Design Criteria for Cable Separation at IP2. The specification requires either double fusing of the circuit or the performance of an engineering evaluation to ensure the availability of minimum safeguards equipment is not compromised if the circuit is not double fused. The modification did not ensure dual fusing or provide an engineering evaluation (Example 1). Following the discovery of this condition, the circuit design was reviewed to ensure it did not constitute a single failure vulnerability. This issue was documented in CR-IP2-2004-01922.

Two examples were identified where cables routed in cable trays crossed from one safety train to another in violation of the electrical separation criteria. One example was identified during a March, 2004 inspection and was discussed in section 1R15 of IR 05000247/2004002. The second example was identified during the current inspection and was documented by the licensee in CR-IP2-2004-03275. These examples reflect the failure of electrical separation design requirements to be translated into installation procedures to avoid cable installation errors (Examples 2 and 3).

Cable ampacity calculation ECX-00012-00 was performed in 1993 to evaluate cables in a cable tray which appeared to exceed tray fill criteria. Subsequent to issuance of the calculation, a cable was added to the tray section evaluated in the calculation but the calculation was not updated to assess the impact of the new cable (Example 4). CR-IP2-2004-03211 was written to document this issue.

Also, the same calculation utilized cable lists and tray dimension information from the WARS database. Recent condition report evaluations were also found to have used WARS data when assessing issues associated with cables and raceways. Design control procedures and processes did not provide guidance or procedures for the use of WARS (now ECRIS) in engineering activities. The WARS database was not subject to the appropriate quality assurance controls and should only have been used as a design aid (Example 5). This issue has been entered into the corrective action program as CR-IP2-2004-03487.

The design process and procedures did not consistently ensure sufficient involvement of cable separation subject matter experts to prevent errors similar to those experienced during the electrical tunnel ventilation modification discussed above (Example 6). Additionally, electrical specification EI-2031 contains a checklist (Appendix K) which provides guidance on cable separation. This guidance is referenced in the design input procedure DE-S-12.613 but was not consistently utilized by design engineering personnel, nor were all design engineers familiar with the document (Example 7). Also, during the electric tunnel ventilation modification (see Section b.1 Item 7 earlier in the report) the need for use of the separation checklist was designated in the design verification checklist as not applicable even though new cables were being installed. These issues have been included in the corrective action program as CR-IP2-2004-01059.

Analysis. The failure of the licensee to implement effective design controls involving electrical cable separation at Indian Point 2 was a performance deficiency. This finding was determined to be greater than minor because if the conditions (weaknesses in design control) were left uncorrected it could result in a more significant safety concern. Specifically, the failure to implement electrical separation design criteria could allow cable fault conditions to adversely impact the availability or reliability of safety functions. This finding could not be evaluated using the SDP, because there was no direct impact identified on Initiating Event, Mitigating Systems or Barrier Integrity cornerstones of reactor safety. In accordance with the guidance in IMC 0612, a management review has determined that the finding is of very low safety significance (Green) because, while there was no current impact, effective implementation of the design controls for electrical cable separation is important to ensure that future changes will be consistent with the Indian Point 2 design basis.

Enforcement. 10 CFR 50 Appendix B, Criteria III, Design Controls, requires, in part, that measures be established to assure that applicable regulatory requirements and design basis are correctly translated into specifications, drawings, procedures and instructions. This criteria also requires that design control measures shall provide for verifying or checking the adequacy of design and that the applicable design basis for structures, systems, and components be translated into procedures. The issues documented above are considered violations of these design control requirements. Because the failures to implement adequate design control measures is of very low safety significance and the issues have been entered into the corrective action program (CRs IP2-2004-03211, -03487, -03275, -01059, -01922) this violation is being treated as a

NCV consistent with Section VI.A of the NRC Enforcement Policy. **NCV 05000247/2004009-01, Failure to Implement Adequate Design Control Measures.**

b.2.b Introduction. A Green NCV was identified for failure to comply with 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, related to inadequate identification and correction of conditions adverse to quality associated with configuration control of the plant electrical cable and raceway systems.

Description. CR-IP2-2002-07454 was issued to identify that the anomalies identified in the DTVR may indicate some data quality issues. Due to the lack of progress on the resolution of the data anomalies an additional condition report, CR-IP2-2003-02665, was initiated and specifically stipulated that an operability determination was required. On June 24, 2003, both of these CRs were closed to an engineering request. However, no detailed operability evaluation had been performed for either of the two CRs (Example 1). Additionally, resolution of the data anomalies was given a low priority which resulted in a failure to implement timely corrective actions to address the DTVR anomalies associated with WARS to ECRIS data conversion activities (Example 2). These issues have been entered into the corrective action program as CR-IP2-2004-01059.

As a result of problems identified during a modification to the electric tunnel ventilation CR-IP2-2001-01087 was initiated. This CR identified several corrective actions that included the need to correct associated raceway design drawings and another to conduct additional WARS training. The inspectors found that these two actions had not been completed and the raceway design drawings continued to be in error (Examples 3 and 4). CR IP2-2004-02693 was initiated to address this issue.

During interviews the inspectors were made aware of a need to correct a number of issues involving cable and raceway configuration control which Entergy personnel described as “bulk data cleanup.” These issues have existed since the time of the cable separation program and at the time of this inspection had not been corrected (e.g. raceway drawings not corrected) and no condition report had been written (Example 5). CR-IP2-2004-02572 has now been written and documents a list of eleven items to be evaluated and dispositioned.

Analysis. The failure of the licensee to take adequate corrective action to address previously identified conditions adverse to quality (data anomalies for plant cabling, drawing inadequacies involving plant cable trays, and inadequate training of the plant cabling data system) was a performance deficiency. This finding was determined to be greater than minor because if left uncorrected these conditions could result in design control failures and a more significant safety concern. Specifically, the failure to implement electrical separation design criteria could allow cable fault conditions to adversely impact the availability or reliability of safety functions. This finding could not be evaluated using the SDP, because there was no direct impact identified on Initiating Event, Mitigating Systems or Barrier Integrity cornerstones of reactor safety. In accordance with the guidance in IMC 0612, a management review has determined that the finding is of very low safety significance (Green) because, while there was no current impact, effective implementation of the design controls for electrical cable

separation is important to ensure that future changes will be consistent with the Indian Point 2 design basis.

Enforcement. 10 CFR 50 Appendix B, Criteria XVI, Corrective Action, requires that conditions adverse to quality be promptly identified and corrected. The failure to implement corrective actions for conditions adverse to quality involving cable separation is considered a violation of these requirements. Because this violation is of very low safety significance and the issues have been entered into the corrective action program (CRs IP2-2004-02693, -03209, -01059) this violation is being treated as a NCV consistent with Section VI.A of the NRC Enforcement Policy. **NCV 05000247/2004009-02, Failure to Identify and Correct Conditions Adverse to Quality.**

b.2.c Introduction. A Green NCV was identified for failure to comply with 10 CFR 50, Appendix B, Criterion XVII, Quality Assurance Records, related to inadequate control of documentation associated with the Cable Separation Program.

Description. Engineering consultant (TENERA, L.P.) and ConEd Cable Separation Program reports and related documents had not been formally reviewed, approved and signed off. Documents were not properly controlled and were not entered into the document control program to ensure that the records, which support the electrical separation design basis document, were retrievable.

Analysis. The failure of the licensee to maintain records concerning the Cable Separation Program at Indian Point 2 was a performance deficiency. This finding was determined to be greater than minor because if the contributing factors that allowed this failure to maintain and retrieve records that furnish evidence of activities affecting quality were left uncorrected it could result in a more significant safety concern. Specifically, the more significant condition could be that the electrical cables installed by future modifications that failed to meet established physical or electrical separation design criteria could allow cable fault conditions to adversely impact the availability or reliability of safety functions. This finding could not be evaluated using the SDP, because there was no direct impact identified on Initiating Event, Mitigating Systems or Barrier Integrity cornerstones of reactor safety. In accordance with the guidance in IMC 0612, a management review has determined that the finding is of very low safety significance (Green) because, while there was no current impact, maintaining quality records of the Cable Separation Program is important to ensure that future changes will be consistent with the Indian Point 2 design basis.

Enforcement. This finding is considered a violation of 10 CFR 50 Appendix B, Criteria XVII, Quality Assurance Records, which requires that sufficient records be maintained to furnish evidence of activities affecting quality and that the records be identifiable and retrievable. Because the failure to adequately maintain the records is of very low safety significance and the issue has been entered into the corrective action program (CRs IP2-2004-01914, -01932 this violation is being treated as a NCV consistent with Section VI.A of the NRC Enforcement Policy. **NCV 05000247/20004009-03, Failure to Properly Maintain Cable Separation Program Records.**

.2 (Update) URI 50-247/03-11-01 Cable Splices in Cable Tray

During a previous NRC inspection, the inspector observed a number of spliced electrical cables in one of the cable trays in the piping penetration (electrical tunnel area). The cable splices were located beneath and about six feet from the containment spay piping. The inspector noted that IP2 IPEEE section 5.2.2.1.4 stated that "....it was noted that there were no cable splices within 10' of any piping." The inspector also noted that these same cable splices had been identified by the licensee in March 2002, and were documented in condition report CR-IP2-2002-02474. In response, the licensee completed an evaluation on April 4, 2002, and determined that there were two safety-related cables (out of 80 cables) in the tray where the splices were identified. One of the safety-related cables was for the refueling water storage tank (RWST) level transmitter and the other for the condensate storage tank (CST) level transmitter.

During this inspection, the inspector reviewed the results of a February 27, 2004, cable tray walkdown that determined the cable for the RWST did not have splices. The CST cable could not be located during the walkdown. The inspector reviewed the instrument loop diagram and determined that the affected CST level transmitter was for indication only and would not directly impact a safety function even if it was in the tray. The inspector also walked-down the identified cable trays and observed that in addition to having cable splices in non-safety related cables that two of the splices with heat-shrink tubing were not heat-shrunk, which is potentially an unacceptable condition if these cables are in use.

The licensee generated work order (WO) IP2-03-17236, which is scheduled for August 23, 2004, to determine: 1) the functions and the risk significance of the spliced cables; and 2) the extent of condition of the use of cable splices in trays. During this inspection period the WO was scheduled for implementation. This unresolved item remains open pending NRC review of licensee's determination of the functions of the non-safety related cable splices and the NRC evaluation for risk significance associated with those cable splices.

4OA6 Meetings, Including Exit

On May 28, 2004, the inspectors met with Indian Point 2 licensing and electrical engineering representatives at the conclusion of the on-site inspection. Following additional in-office review and assessment the inspectors conducted an exit meeting with Mr. F. Dacimo, and other members of the IP-2 staff on July 20, 2004. At that time, the purpose and scope of the inspection were reviewed, and the preliminary results were presented. The licensee acknowledged the preliminary inspection results.

On August 5, 2004, the licensee was contacted by telephone to provide the NRC's disposition of the issue dealing with cable hops identified during plant walkdowns.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

J. Balla	Employee Concerns Manager
F. Bloise	PI-10 Project Manager
W. Brule	Contractor, EPM
P. Conroy	Licensing Manger
K. David	Contractor, Kinetic Decisions
E. Davis	Electrical Engineer
J. Gizunterman	Electrical Engineer
P. Gropp	Manager, DBI Program
T. Jones	Licensing
M. Khan	Electrical Engineer
D. Leach	IPEC Engineering Director
T. McCormack	Electrical Designer
W. Mahlmeister	Technical Specialist
R. Milici	Supr. Electrical Design Engineer
S. Petrosi	Manager, Design Engineering
J. Piazza	Contractor, Kinetic Decisions
J. Raffaele	Design Supervisor, Electrical
J. Reynolds	Corrective Action & Administration Supervisor
H. Robinson	Electrical Engineer
B. Rokes	Licensing Engineer
J. Sweeney	Electrical Designer
J. Tuohy	Manager, Engineering Support
S. Zulla	Entergy Consultant

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

NCV 05000247/200409-01	A non-cited violation of 10 CFR 50, Appendix B, Criterion III “Design Control,” for the failure to implement adequate design control measures for issues associated with design of electrical cables and raceways.
NCV 05000247/200409-02	A non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” for the failure to identify and correct conditions adverse to quality associated with electrical cables and raceways.

NCV 05000247/200409-03	A non-cited violation of 10 CFR 50, Appendix B, Criterion XVII, "Quality Assurance Records," for the failure to properly maintain cable separation program records.

Closed

URI 05000247/200402-07	Review of Entergy's technical basis for the operability of safety systems associated with the WARS to ECRIS conversion and associated issues involving Entergy's handling of this cable separation issue.

Opened

URI 05000247/200409-04	NRC review of the acceptability of the use of dual fusing at IP2.

Discussed

URI 05000247/200311-01	Acceptability of cable splices in a Cable Tray.

LIST OF DOCUMENTS REVIEWED

Condition Reports

CR-IP2-1997-02475 - Creation of Equipment and Programs Engineering
CR-IP2-1998-00882 - Temporary cables found in contact with class 1E conduit
CR-IP2-1998-03574 - Electrical separation question with RPS wiring
CR-IP2-1998-07219 - FPX-98-13074F Mod error in required separation
CR-IP2-1998-08557 - UFSAR question about horizontal and vertical separation
CR-IP2-1999-06924 - Question about barrier criteria
CR-IP2-2000-01726 - Motor Driven AFW pump control circuits
CR-IP2-2000-03176 - Safeguards Control Panels SB-1 and SB-2
CR-IP2-2000-08830 - Common feed to single voltmeter
CR-IP2-2000-09084 - Several short comings in WARS
CR-IP2-2001-01087 - WARS error with identifying color codes
CR-IP2-2001-12336 - Anticipates data anomalies from WARS to ECRIS conversion
CR-IP2-2001-12337 - Anticipates data anomalies from WARS to ECRIS conversion
CR-IP2-2001-12553 - Mixing of safety and non-safety 118VAC instrument circuits
CR-IP2-2002-02474 - Improperly spliced cables found in cable tray
CR-IP2-2002-07454 - Resolve discrepancies identified by the WARS to ECRIS conversion
CR-IP2-2002-10253 - Unsatisfactory Transite barriers
CR-IP2-2003-00765 - Charging pump cables do not meet Appendix R
CR-IP2-2003-00798 - Develop Plan of Action to address CR-IP2-2003-00765
CR-IP2-2003-00867 - Service Water Pumps do not meet Appendix R
CR-IP2-2003-02591 - Documents failure to document extension approval in

CR-IP2-2003-02665 - Resolve data discrepancies, WARS to ECRIS conversion
CR-IP2-2003-04684 - ECRIS not listed in the Software QA Catalog
CR-IP2-2003-06810 - Re-identifies the improper splices from CR-IP2-2002-02474
CR-IP2-2003-07438 - Tracking closure of 15 open items in IP2-DBD-222 rev 1
CR-IP2-2004-01045 - Discrepancies between website and MAXIMO
CR-IP2-2004-01059 - Reopens resolution of WARS to ECRIS data discrepancies
CR-IP2-2004-01241 - Resolving non-safety cable found in redundant safety trains
CR-IP2-2004-01454 - Maintaining rev 0 of Electrical Separation DBD
CR-IP2-2004-01914 - Investigating resolution of open items from CSR-111
CR-IP2-2204-01922 - Cable found during mod review that does not meet double fusing enhancement requirement
CR-IP2-2004-01932 - Investigating additional open items from CSR-111
CR-IP2-2004-02572 - Resolving Bulk Data Cleanup issues
CR-IP2-2004-02693 - Inadequate corrective actions in CR-IP2-2001-01087
CR-IP2-2004-03209 - Incorrect breaker control description in UFSAR
CR-IP2-2004-03211 - Failure to update tray fill calculation
CR-IP2-2004-03275 - Resolving cable hop found in Cable Spreading Room
CR-IP2-2004-03487 - Ensure adequacy of WARS/ECRIS for engineering addressed in PI-10

Engineering Requests/Work Orders/Modifications

Work Order IP2-03-17236 - Repairing or removing improperly spliced cables
ER-IP2-03-20601, Review and Resolve ECRIS to WARS Data Transfer Verification Report Anomalies, Revision 0
ER-IP2-04-18159, Review of Cables Installed Post 1995
FIX-95-10935, Modification that replaced electrical tunnel exhaust fan controllers
FPX-96-12153-F, Modification that installed cable JA9-JG7/01
Generic Modification GMT-07205, Rev. 0, Generic Modification Table for Cables with Double Protection

Calculations/Evaluations

EGP-00035, Rev.0, Failure Mode/ Effect Analysis Calculation - I2T Evaluation for Lighting Transformer 22 Heavy Power Cables
EGP-S80-009, Rev. 2,‘ Calculation: Metal Dividers for Heavy Power Cable Trays
ECX-00012-00 Tray fill calculation for several trays
MPE-S46-002-0, Evaluation of Addition of Siltemp Blanket to Control and Small Power Cable (Mod. No. MPE-90-05134)
IP2-RPT-04-00007, Engineering Report: Evaluation of Cable Separation Issue With Circuit MCC27-8MR, Revision 0
IP-CALC-04-00656, May 26, 2004, Cable Tray Evaluation and Documentation - Seismic Qualification
SGX-00010-01, February 3, 1993, Calculations for Double Fusing Modification
Safety Evaluation No. 89-127-MD, April 1989, IP2 Installation of Current Limiters

Safety Evaluation No. 90-365-MD, Rev 2, dated August 14, 1996, Metal Barriers and Blanket Installation for Small Power and Control and Instrumentation Cable Separation

Safety Evaluation No. SE 00-502-MM, Rev. 0, Transfer of Feed for Emergency Seal Oil Pump Motor (Mod. No. FEX-98-13126-E)

Safety Evaluation 92-131-GM, Rev. 2, Additional Circuit Protection for Cables

Engineering Request ER-IP2-04-18159, 2004, Summary Review of Cable Installed Post 1995

Drawings

138734-50, Rev. 46, IP Unit 1, Cable Troughs and Conduits in Terminal Board Room - Plans and Sections

400066, Rev. 0, IP2 Health physics Remote Viewing System Conduit & Tray Schematic

9321-F-3005, Rev. 104, One Line Diagram 480V Motor Control Center 27 & 27A

9321-F-3006, Rev. 92, One Line Diagram 480V Motor Control Center 26 & 26A

9321-F-3048, Rev. 24, Modified Cable Tray Layout for MCC 26A, 26B, 27 & Lighting SWGR S.E. Corner of P.A.B. El. 80"0"

9321-F-3056, Rev. 41, IP2 Control Bldg Elev. 33'-0" Cable Spreading Room Cable Trays - Plan

9321-F-3307, Rev. 26, Conduit & Cable Tray Schematic for MCC 26A, 26B, 27, & Lighting SWGR S.E. Corner of P.A.B. El. 80'-0"

9321-F-3060, Rev. 40, Plan Primary Auxiliary Building

9321-F-3065, Rev. 20, Cable Trays - Sections Primary Auxiliary Building

9321-F-3062, Rev, 35, Cable Trays, Bus Duct and Conduits in Electrical Tunnel - Plan

9321-F-3082, Sheet 2, Rev. 75, Conduit Layout Primary Auxiliary Building

9321-F-3083, Sheet 3, Rev. 69, Conduit Layout Primary Auxiliary Building

9321-F-3084, Sheet 4, Rev. 36, Conduit Layout Primary Auxiliary Building

9321-F-3085, Sheet 5, Rev. 26, Conduit Layout Primary Auxiliary Building

A206853, Rev. 16, Conduit & Tray Connection Schematic Primary Auxiliary Building El. 68'-0"

A206854, Sheet 1, Rev. 21. Conduit & Tray Connection Schematic Primary Auxiliary Building El. 80'-0"

A206857, Rev. 10, Conduit & Tray Connection Schematic Primary Auxiliary Building Waste Hold-up Tank Pit El. 58'-0" & Roof Area

A206862, Sheet 4, Rev. 16, Tray Connection Schematic Control Bldg El. 33'-0"

A206870, Sheet 2, Rev. 15, Conduit & Tray Conn. Schematic Electrical Tunnel to Penetration

A208500, Rev. 43, One Line Diagram for 480V AC MCC 26AA and MCC 26BB & 120 V AC Dist. Panel 1 & 2

A208507, Rev. 35, One Line Diagram 480V Motor Control Center 28 & 210

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List of Major Logic Changes to WARS
Station Administrative Order SAO-405, Rev. 17, Engineering Change Process
Specification EI-2031, Rev. 0, Design Criteria for Cable Separation at IP2
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Updated Final Safety Analysis Report

LIST OF ACRONYMS

CAP	Corrective Action Program
CARR	Cable Anomaly Resolution Report
CFR	Code of Federal Regulation
CR	Condition Report
CSR	Cable Separation Report
CST	Condensate Storage Tank

DBD	Design Basis Document
DBI	Design Basis Improvement
DMD	Design Modification Drawing
DTVR	Data Transfer Verification Report
ECP	Employee Concerns Program
ECRIS	Electrical Cable and Raceway Information System
EPM	Engineering Planning and Management
ESF	Engineered Safety Feature
ESFAS	Engineered Safety Features Actuation System
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
IP2	Indian Point Unit 2
IPEC	Indian Point Energy Center
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
OA	Other Activities
OCR	Observation/Comment/Response Form
PAMS	Post-Accident Monitoring System
QA	Quality Assurance
RPS	Reactor Protection System
SDP	Significance Determination Process
SE	Safety Evaluation
UFSAR	Updated Final Safety Analysis Report
WARS	Wire and Raceway System