



**ENTERGY**

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**JOHN R. McGAHA, JR.**  
Vice President  
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May 11, 1994

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

Subject: River Bend Station  
Unit 1  
Docket No. 50-458  
License No. NPF-47  
Response to Notice of Violation and Proposed Imposition  
of Civil Penalty 50-458/9330-02 (EA 94-010)

File Nos.: G9.5, G15.4.1

RBG- 40573

Gentlemen:

Entergy Operations, Inc. (EOI) hereby submits its response to the Notice of Violation 50-458/9330-02 (EA 94-010) and payment of \$100,000.00 for the proposed civil penalty.

EOI would like to use this opportunity to comment on the proposed civil penalty. RBS has made improvements in the Fire Protection Program as evidenced by its efforts to identify and correct discrepancies in the FHA, inspect penetration seals and structural steel fire barriers as well as test materials and configurations, and consistently disclose findings to the NRC. As indicated in this submittal and at the Enforcement Conference for this violation, RBS is continuing its efforts to further enhance the RBS Fire Protection Program. Examples of these efforts include: an emergency lighting study; a review of operator actions required during a fire (time/manpower study); and a self assessment of the RBS Fire Protection Program by engineers from other EOI plants.

Significant changes have been made in order to improve management control of fire protection issues. EOI organized a multi-discipline fire protection team to address fire protection issues and assigned an experienced Project Manager to coordinate fire protection activities. Efforts have been made to ensure that the EOI fire protection staff at RBS is better trained and qualified to ensure less

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Response to Notice of Violation and Proposed Imposition  
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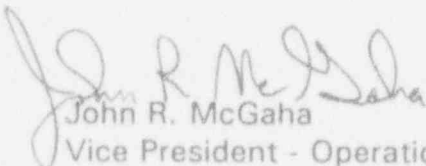
RBG-40573

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reliance on contractor support. As shown through these efforts EOI management's role in the RBS fire protection program has been and still remains very proactive. EOI management realizes the need to continue its focus toward the RBS Fire Protection Program.

Should you have any questions, please contact Mr. O.P. Bulich of my staff at (504) 336-6251.

Yours truly,

  
John R. McGaha  
Vice President - Operations

attachments

cc: NRC Resident Inspector  
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St. Francisville, LA 70775

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Mr. James Lieberman  
Director, Office of Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

BEFORE THE  
UNITED STATES NUCLEAR REGULATORY COMMISSION

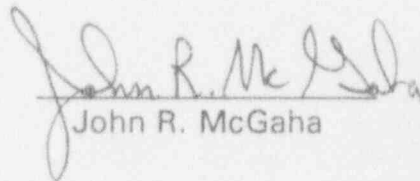
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LICENSE NO. NPF-47

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DOCKET NO. 50-458

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IN THE MATTER OF  
  
GULF STATES UTILITIES COMPANY  
  
CAJUN ELECTRIC POWER COOPERATIVE AND  
  
ENTERGY OPERATIONS, INC.

\_\_\_\_\_  
AFFIRMATION


I, John R. McGaha, being duly sworn, state that I am the Vice President-Operations of Entergy Operations, Inc., at River Bend Station; that on behalf of Entergy Operations, Inc., I am authorized to sign and file with the Nuclear Regulatory Commission, Notice of Violation (NOV) 50-458/9330-02 for River Bend Station; that I signed this NOV as Vice President-Operations at River Bend Station of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information, and belief.

  
John R. McGaha

STATE OF LOUISIANA  
WEST FELICIANA PARISH

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the Parish and State above named, this 11<sup>th</sup> day of May, 1994.

(SEAL)

  
Notary Public

## ATTACHMENT

### REPLY TO NOTICE OF VIOLATION 50-458/9330-02 (EA 94-010) LEVEL III

#### REFERENCES

Notice of Violation - Letter from L.J. Callan to J.R. McGaha dated April 11, 1994.

Letter from J.J. Fisicaro to U.S. NRC Document Control Desk dated February 18, 1994.

Inspection Report 93-30 - Letter from T.P. Gwynn to J.R. McGaha dated February 1, 1994.

Letter from J.J. Fisicaro to U.S. NRC Document Control Desk dated December 6, 1993.

#### VIOLATION

River Bend Station operating license NPF-47 states, in part, that "GSU [Entergy Operations, Inc.] shall comply with the requirements of the fire protection program as specified in Attachment 4." Attachment 4 to NPF-47 states, in part, that GSU [Entergy Operations, Inc.] shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis for the facility through Amendment 22 and as approved in the SER dated May 1984 and Supplement 3 dated August 1985..." Part 9B.2 of Appendix 9B, "Fire Protection Program Comparison With Appendix R to 10CFR50," to Section 9.5.1, "Fire Protection System," of the River Bend Updated Safety Analysis Report, part of the approved fire protection program described above, states in part that "RBS complies with these criteria as discussed in the remainder of this appendix."

Part 9B.4.7.1 of Appendix 9B requires, in part, that fire protection features shall be provided for systems and components important to safe shutdown. These features shall be capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control stations is free of fire damage.

Contrary to Part 9B.4.7.1 of Appendix 9B,

- 1) Associated circuits that shared common enclosure with the Division I emergency diesel generator controls and the Division I standby service

water pumps, components necessary to achieve and maintain hot shutdown following a main control room fire, were not provided fire protection features, namely overcurrent protection, with the result that those components could have been unavailable in the event of a main control room fire.

- 2) Circuits for the Division I Standby Service Water Cooling Tower Fans, components necessary to achieve and maintain hot shutdown following a main control room fire, were not isolated from the main control room with the result that a main control room fire could have prevented local starting of these fans as required.
- 3) Fuses protecting the control circuits for 4160V and 480V circuit breakers were improperly sized and would not have protected the cables from short circuit damage. As a result, components, including the Division I emergency diesel generator, necessary to achieve and maintain hot shutdown following a main control room fire could have been unavailable.
- 4) Conduit 1CC0030C in fire area C-24 was not provided fire protection features with the result that a fire in fire area C-24 could have damaged control cables necessary to operate equipment, including the Division III emergency diesel generator output breaker required for operation of the emergency diesel generator, necessary to achieve and maintain hot shutdown.
- 5) Circuits associated with the reactor vessel level 8 trip and reactor feedwater pumps breaker control were not provided fire protection features with the result that a main control room fire could have led to steam line flooding and damage to valves necessary to achieve and maintain hot shutdown.

EOI agrees with the cited violation. The potential existed for a fire to occur in either the main control room (fire area C-25) or the 116' elevation of the control building (fire area C-24) which could have rendered equipment dedicated to ensuring the safe shutdown of RBS unavailable. However, the probability of occurrence of these postulated events is very low and operator actions in most cases could have overcome these postulated events and brought the plant to a safe shutdown condition.

#### **BACKGROUND**

River Bend Station (RBS) Licensee Event Report (LER) 89-036 identified 19 motor operated valves listed in Tables 2 and 5 of design specification 240.201 as having

power removed during plant operations which had not been de-energized. As part of the corrective action, an initial review of the Fire Hazards Analysis (FHA) by engineering was completed in January, 1990, to verify the consistency of the existing design and operational procedures. NRC Inspection Report 90-02 identified this as an Unresolved Item (9002-02) since the review was not complete at the time of the inspection. No other procedural inconsistencies were identified during this review.

A further review of the FHA by an independent contractor was completed in January 1991. During this review, 106 discrepancies were identified. Some of these discrepancies required resolution prior to completing a verification of the FHA. Of the 106 discrepancies, 23 were identified as potentially affecting Pre-fire Strategies, Appendix R separation, and the USAR. These 23 items were reviewed and corrective actions identified by April 15, 1991. Corrective actions identified for 22 of the 23 items are considered enhancements and involve changes to the FHA, USAR, Pre-fire Strategies, procedures or design documents. The remaining item involved fire areas where potential fire damage could cause loss of reactor core isolation cooling (RCIC). RCIC is used for vessel level control in Method 1 Safe Shutdown Methodology as identified in the FHA. Analysis has shown that alternate equipment, free of fire damage, is available in each of these fire areas to assure safe shutdown capability.

Evaluations for the remaining 83 items were completed prior to February 1992. Corrective actions identified for 79 of these items were categorized as enhancements and involved revisions to the FHA, USAR, Pre-fire Strategies, procedures or design documents. The remaining 4 items were evaluated and appropriate corrective actions determined.

As a result of this reverification, a number of enhancements were completed including: an associated circuit, common power supply study; creation of abnormal operating procedure (AOP) 0052, "Fire Outside Main Control Room (In Areas Containing Safety Related Equipment)"; and implementation of a high impedance fault recovery procedure.

Inspection 50-458/93-09 was conducted by Messrs. A. Singh, H. Bundy, M. Murphy, A. Fresco and K. Sullivan from March 29 through April 2, 1993, of the RBS Fire Protection program. During that inspection it was determined that RBS did not identify and correct a deficiency in the FHA. In essence, the FHA did not contain information necessary to support certain assumptions that electrical control circuits required to assure a safe shutdown of the facility would not be adversely affected by certain associated circuits.

NRC Inspection Report 50-458/93-09 included several examples of associated circuit, common enclosure concerns. However, further analysis of those circuits

and their cable failure modes showed that, in fact, no associated circuit, common enclosure concerns existed. Even though no examples of associated circuit, common enclosure concerns were discovered at that time, RBS committed to complete an associated circuit, common enclosure analysis as part of its effort to revise design criterion document 240.201 and restructure it into a complete post-fire safe shutdown analysis. The five issues identified in this violation were discovered during this analysis.

### REASON FOR THE VIOLATION

A root cause analysis determined that the construction architect/engineering firm tasked with the original development of the RBS FHA and safe shutdown analysis as well as GSU project management did not have a clear understanding of the level of detail necessary to demonstrate compliance with Sections III.G and III.L of 10CFR50, Appendix R. This lack of a clear understanding of the level of detail necessary to demonstrate compliance with Sections III.G and III.L of 10CFR50, Appendix R was due to several contributing factors, as follows:

- 1) Guidance documents, such as Generic Letter 81-12, were interpreted by GSU as being applicable only to those plants that were committed to full compliance with Appendix R. Note that RBS was not committed to full Appendix R compliance, but was required to provide a comparison of the RBS Fire Protection Program with Appendix R in Chapter 9, Appendix B of the RBS FSAR.
- 2) Written guidance was not developed by GSU to establish the required content and methodology applicable to the project.
- 3) GSU did not provide training specific to the project to personnel involved.
- 4) GSU treated the project as Quality Assurance Category III work. As such, independent design verification was not employed. This resulted in project personnel establishing requirements without obtaining an independent assessment of the methodology employed.

### CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

The individual issues have been addressed in great detail in previous correspondence. LER 91-008 identified FHA deficiencies with respect to missing fire wrap. Supplements to LER 91-008 address: the associated circuits, common enclosure issue (Item 1); the standby service water cooling tower fans (Item 2), the Division III control circuits (Item 4), and the reactor high water level trip issue (Item 5). LER 93-021 addresses the remote shutdown panel issue. Also, GSU's letter



dated December 6, 1993, and its supplement dated February 18, 1994, (see Reference section) provide a summary of each issue with corrective actions. Each of these submittals is incorporated herein by reference. Following is a brief discussion of each issue and its corrective action.

1) ASSOCIATED CIRCUITS, COMMON ENCLOSURE

During the review of the Safe Shutdown Analysis (SSA), ten switchgear control circuits were found which have the potential to damage cables required for safe shutdown method 1E when method 1E is needed for post-fire safe shutdown. These circuits did not have adequate overcurrent protection and share a raceway with a cable required for safe shutdown method 1E. In the event of a main control room (MCR) fire, these ten circuits could be damaged due to overcurrent and may cause damage to safe shutdown cables in a raceway remote from the MCR.

Modification request (MR) 93-0060 was initiated to install properly sized fuses in the circuits associated with these cables. The circuits that form an associated circuit, common enclosure concern are scheduled to be modified before the end of RF-5. In the interim, the affected cables have been treated as having a missing fire barrier per 10CFR50, Appendix R, III.G.2. Thus, the action statement for RBS Technical Specification 3/4.7.7, "Fire Rated Assemblies," was entered and a roving fire watch was verified for the MCR and areas of the plant containing the affected raceway.

The 4160 volt and 480 volt control circuits at RBS were protected by 35 amp fuses. This fuse size does not protect control circuit wiring for circuits of excessive length. Switchgear manufacturers typically use a large size fuse in this application to ensure the switchgear's operation. Sacrifice of control circuit integrity was considered acceptable in this situation because the primary function of the switchgear is electrical protection under fault conditions. The appropriately sized fuse added by MR 93-0060 will ensure operation of the switchgear while protecting the control circuit.

2) STANDBY SERVICE WATER COOLING TOWER FANS

Analysis of the control circuits for the Division I standby cooling tower (SCT) fans identified the potential loss of the ability to start the Division I SCT fans (1SWP\*FN1A,C,E,G,J,L,Q,S and U) from their local motor control center (MCC) following a MCR fire. The RBS FHA takes credit for starting the SCT fans from the MCC during a MCR fire. In the event of a MCR fire, the control circuits for the SCT fans could short and blow the fuse protecting the circuit. The circuit is not isolated from the MCR, therefore, after repositioning the local remote selector switch at the MCC, fan starting



would not occur due to the short circuit. Replacement of the fuse, as stated in the FHA, would not solve the problem since this does not remove the short from the circuit.

The corrective action for the standby cooling tower fans was to implement MR 93-0056. This MR provided fuses to isolate portions of the affected circuits which enter the MCR from the portions of the circuit required for remote shutdown functions. The additional fuses ensure that the standby cooling tower fans will be available following a fire in the MCR.

### 3) REMOTE SHUTDOWN PANEL

During the revision of the RBS SSA the electrical design member of the fire protection team discovered that the control circuits for 4160 volt and 480 volt circuit breakers may not function properly in the event of a MCR fire. These circuit breakers supply power to loads required for remote shutdown from outside the MCR. For the 4160 volt and 480 volt loads required for safe shutdown, it was found that fuses protecting the control circuits for these loads did not adequately protect the cables in the circuits. In the event of a MCR fire, these circuits could short in the MCR. Due to the length of the cable in these circuits, there would be insufficient short circuit current to blow the fuse before the occurrence of cable damage. The postulated ten minutes to exit the MCR and operate the transfer switches to isolate the MCR from remote shutdown systems is greater than the estimated time in which cable damage would occur. The cable which would be damaged contains conductors which are required for remote shutdown as well as conductors that are isolated by the remote shutdown transfer switch.

The corrective action for this concern was completed with the installation of appropriately sized fuses to ensure that circuits are available for post fire safe shutdown or that they are no longer an associated circuit concern (MR 93-0060). RBS expedited the completion of the 17 fuse installations, restoring those circuits that serve credited safe shutdown equipment within the time limit of the technical specification LCO (TS 3/4.3.7). As a follow-up action a thorough review of the remote shutdown system was completed to verify that no other control circuits for 4160 volt and 480 volt circuit breakers could prevent remote shutdown capability in the event of a MCR fire due to inadequately sized fuses.

The 4160 volt and 480 volt control circuits at RBS were protected by 35 amp fuses. This fuse size does not protect control circuit wiring for circuits of excessive length. Switchgear manufacturers typically use a large size fuse in this application to ensure the switchgear's operation. Sacrifice of

control circuit integrity was considered acceptable in this situation because the primary function of the switchgear is electrical protection under fault conditions. The appropriately sized fuse added by MR 93-0060 ensures operation of the switchgear while protecting the control circuit.

#### 4) DIVISION III CONTROL CIRCUITS

The original FHA acknowledged and justified the separation between the Division I and Division II transformers in fire area C-24 (RBS USAR 9A.2.5.1). Two shutdown methods were credited for fire area C-24 depending upon the location of a fire within the area. Method 1 was credited for a fire in one side of the fire area while method 2 was credited for a fire in the other side of the fire area. As a revision to the FHA (now the Safe Shutdown Analysis), the credited shutdown method for fire area C-24 was changed to a single shutdown method for the entire fire area.

In the process of changing the credited method in fire area C-24, it was discovered that Division III cables exist in the area which had been incorrectly labeled as "spared" in the Electrical Cable Scheduling and Information System. These cables provide control power to 4160 volt circuit breakers associated with Division III incoming line breaker 1E22\*ACB04, Division III diesel generator output breaker 1E22\*ACB01, and Division III 480 volt supply transformer breaker 1E22\*ACB03. Since these cables are physically located in the portion of C-24 which had previously credited shutdown method 1, they should have been protected with a fire barrier. The SSA was revised to change the shutdown method for fire area C-24 to method 2. Since the referenced cables are only credited for method 1, no further corrective action was necessary.

#### 5) REACTOR HIGH WATER LEVEL TRIP

While verifying revisions to procedure AOP-0031, "Shutdown from Outside the Main Control Room," resulting from the revised SSA, an operator assisting with the SSA revision discovered that a fire in panel 1H13-P612 or 1H13\*P680 in the main control room could disable the continuity of 125 volt DC circuitry to the "Reactor High Water Level" (Level 8) trip circuitry or the breaker control circuitry for the reactor feedwater pumps. This could cause a loss of automatic shut-off of feedwater supply into the reactor pressure vessel (RPV). This potential loss of 125 volt DC circuit continuity would occur if the fire created circuit faults such as open circuits or hot shorts which resulted in a loss of the ability to provide power to trip coils or which blew control circuit fuses. The only instance in which the proposed scenario could occur is if the fire disabled the continuity of the 125 volt DC cables in a continuously monitored and manned panel (P680) in the main

control room without initiating the Halon suppression system protecting the wireways containing the affected cables.

Immediately after this condition was identified, an MCR Fire Response Brief was written to inform oncoming shifts of the identified concern and established new interim measures in the event of a MCR fire (i.e., a dedicated operator will be immediately dispatched to the normal power supply switchgear (NPS-SWG) located in normal switchgear building regardless of fire severity). The MCR Fire Response Brief provides heightened operator awareness of the condition described above. Also, a Standing Order was written to provide operators with instructions for responding during a MCR fire at panel 1H13\*P680. The Standing Order coupled with heightened operator awareness provides adequate assurance that this is not a condition adverse to quality and that the plant can be safely shutdown in the event of a MCR fire. As long term corrective action, changes to AOP-0031 as well as operator training will be completed prior to the end of RF-5.

Four of the five issues discussed above involve a MCR fire. Several aspects of MCR design minimize the potential effects of a fire. A main control room fire "zone" (PGCC zone) consists of termination cabinets, panels, and floor space beneath these items for each row of cabinets. For a fire to spread from one PGCC zone to another, it must either propagate from one row of unconnected cabinets to another or propagate beneath the floor. Propagation from cabinets in one PGCC zone to cabinets in another PGCC zone is not expected for a realistic fire due to the separation of the cabinets and the tendency for cabinet fires to remain within the cabinet. Propagation beneath the floor would require failure of at least one and most likely two Halon suppression systems. This is unexpected since the reliability of Halon suppression is high. Also, failure of the Halon system to automatically initiate can be mitigated by operator action (i.e., Halon actuation push buttons are located on the cabinets in each PGCC zone).

The MCR is continuously manned by operators trained in the use of portable fire extinguishers. Also, one hour roving fire watches have been in effect for all normally accessible safety related areas of the plant, including the MCR, since 1991. Widespread use of firewatches combined with fixed fire detection systems ensure that incipient fires will not develop without being detected and extinguished. Firewatch personnel are trained to inspect for protection of combustibles, introduction of new combustibles, housekeeping requirements, and evidence of fire.

All corrective actions for each of the above issues will be completed by the end of RF-5, currently scheduled to end in June 1994.

## CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER FINDINGS

Additional actions have been scheduled to detect any remaining issues within the RBS Fire Protection Program. Some of these actions are listed below:

### IMPROVE DOCUMENTATION OF SSA

Planned improvements to the SSA include:

- 1.) Supplement the appropriate sections of the SSA to provide additional detail of how the spurious actuation analysis requirements described in GL 86-10 are applied.
- 2.) Incorporate into the instrument damage discussion the effects of fire on the instrument sensing line process fluid and add an instrument tubing table with instrument mark number, fire area/zone, tubing route by fire area/zone, and location of tubing endpoints to document sensing line evaluation.
- 3.) A review of assumptions made in the SSA was completed in February, 1994. No new issues were identified.

RF-5 has been selected as the completion date to coincide with the completion of installation of modifications required as a result of the SSA review. In the interim a clarification document (DCN 93-0650) has been issued to address item 1 above.

### EMERGENCY LIGHTING STUDY

To insure adequate lighting for safe shutdown, installed emergency lighting was verified to function properly by December 31, 1993. Independently, an engineering evaluation of emergency lighting was completed by January 31, 1994. A walkdown was performed to identify which emergency lighting units were needed for the operation of safe shutdown equipment as well as access/egress routes. With the assistance of Operations, both normal and alternate routes were determined from the main control room and the Division I remote shutdown room to equipment which may need to be manually positioned for post-fire safe shutdown.

As a result of the above activities, the need for additional lighting in specific areas and improvements to preventive maintenance procedures was identified. These corrective actions will be completed by December 1994. In the interim, a Night Order was issued emphasizing to operators the need to use portable lighting until permanent fixed lighting is installed and adequate

lanterns were verified to be available both in the main control room and at the remote shutdown panel.

A list of emergency lighting units and the drawings showing the manual action locations and access/egress routes was incorporated into the SSA as Appendix M of Design Criterion 240.201A.

#### MANUAL ACTION OPTIMIZATION STUDY

A review of operator actions required during a fire will be completed to document that adequate manpower is available. This study will also determine if procedure steps can be prioritized to more efficiently allocate operator manpower. Some independent re-verification of past analyses will be performed in support of this study. This study will be completed by the end of RF-5, currently scheduled to end in June 1994. Any necessary corrective actions will be completed by December 1994.

#### EOI SELF ASSESSMENT

A self assessment of the RBS Fire Protection Program by engineers from other EOI plants will provide insight into the program's strengths and weaknesses. This self assessment will be completed by the end RF-5, currently scheduled to end in June 1994.

#### INDIVIDUAL PLANT EVALUATION OF EXTERNAL EVENTS (IPEEE)

In response to Generic Letter 88-20, Supplement 4, RBS will be submitting an IPEEE by June 27, 1994. A major portion of this submittal will address fire protection. This will provide an additional tool to prioritize efforts in improving the fire protection program.

#### STRENGTHEN STAFFING AND MANAGEMENT

A multi-discipline review group was set up to monitor the SSA revision, as well as other fire protection projects, in June, 1993. A fire protection engineer, senior reactor operator, electrical design engineer, nuclear safety engineer, civil/structural engineer, and maintenance fire protection coordinator were assigned to the group. Several members of the fire protection team are part of the in-line modification review process.

To further improve the fire protection team, an experienced Project Manager has been designated to coordinate all fire protection activities. Also, an in-house fire protection system engineer will be added to the staff.

#### DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The five issues identified during the reverification of the RBS Safe Shutdown Analysis will be completed by the end of RF-5, currently scheduled to end in June 1994. To further enhance the RBS Fire Protection Program and detect any remaining issues as well as assure future compliance with applicable NRC fire protection requirements the actions described above will be completed by December 1994.