UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-4005

June 19, 2006

EA-06-103

Paul D. Hinnenkamp
Vice President - Operations
Entergy Operations, Inc.
River Bend Station
5485 US Highway 61N
St. Francisville, Louisiana 70775

SUBJECT: RIVER BEND STATION - NRC INSPECTION REPORT 05000458/2006011; PRELIMINARY WHITE FINDING

Dear Mr. Hinnenkamp:

On May 10, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your River Bend Station. The purpose of the inspection was to assess the impact that the removal of seismic monitor instrumentation from service had on the ability of River Bend Station personnel to make an accurate and timely emergency action level classification following a seismic event. The enclosed inspection report documents an inspection finding which was discussed on May 10, 2006, with you and other members of your staff.

The report discusses a finding that appears to have low to moderate safety significance. As described in Section 1EP04 of this report, this issue involved a failure to ensure that adequate preplanned measures were in place to ensure accurate and timely emergency classification using seismic activity emergency action levels during periods when seismic monitoring instrumentation was out of service at various times in 2004 and 2005. With certain seismic monitor instrumentation removed from service, the River Bend Station Emergency Plan would not provide adequate direction to station personnel to declare a Site Area Emergency following a seismic event. This finding was assessed based on the best available information using the applicable Significance Determination Process and was preliminarily determined to be a White finding.

This finding does not present a current safety concern because your staff returned the seismic monitors to an operable condition. Additionally, your staff issued Standing Order 194 on April 11, 2006, which provided preplanned measures for implementing the Emergency Plan emergency action levels should the seismic monitors be removed from service.

This finding is also an apparent violation of NRC requirements and is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current enforcement policy is included on the NRC's website at http://www.nrc.gov/what-we-do/regulatory/enforcement.html.

Before the NRC makes a final decision on this matter, we are providing you an opportunity to: (1) present to the NRC your perspectives on the facts and assumptions, used by the NRC to arrive at the finding and its significance, at a Regulatory Conference or (2) submit your position on the finding to the NRC in writing. We note that a position paper was provided to the NRC on April 18, 2006, related to the safety significance and regulatory considerations associated with this issue. The NRC will consider this information prior to making a final decision on this matter. If you request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit any additional supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of the receipt of this letter.

Regardless of the method you select to present your position on this matter, we request that you specifically discuss the procedures that existed at River Bend Station, the training provided to Operations Shift Managers and Emergency Directors, and the specific methods (including data sources) that would be utilized by personnel to make an accurate and timely emergency action level classification following a seismic event during the periods that seismic monitoring instrumentation was out of service.

Please contact Mr. Kriss Kennedy at (817) 860-8144 within 10 business days of the date of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decision and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the NRC has not made a final determination in this matter, no Notice of Violation is being issued for the inspection finding at this time. In addition, please be advised that the characterization of the apparent violation described in the enclosed inspection report may change as a result of further NRC review.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of 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).

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,

/RA/

Arthur T. Howell III, Director
Division of Reactor Projects

Docket: 50-458
License: NPF-47

Enclosure:
NRC Inspection Report
05000458/2006001
w/attachments

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SUNSI Review Completed: _____ ADAMS: ☐ Yes ☐ No Initials: _____
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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket:	50-458
License:	NPF-47
Report:	05000458/2006011
Licensee:	Entergy Operations, Inc.
Facility:	River Bend Station
Location:	5485 U.S. Highway 61 St. Francisville, Louisiana 70775
Dates:	May 3-10, 2006
Inspectors:	P. Alter, Senior Resident Inspector, Project Branch C M. Miller, Resident Inspector, Project Branch C
Approved By:	K. M. Kennedy Chief, Project Branch C

SUMMARY OF FINDINGS

IR 05000458/2006011; 05/03/2006 - 05/10/2006; River Bend Station; Emergency Action Level and Emergency Plan Changes

The report documents the NRC's inspection of the impact that the removal of seismic monitor instrumentation from service had on the ability of River Bend Station personnel to make an accurate and timely emergency action level classification following a seismic event. During this inspection, a finding was identified which was preliminarily determined to be of low to moderate safety significance (White). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter 0609, "Significance Determination Process." 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: Emergency Preparedness

- TBD. An apparent violation of 10 CFR 50.54(q) was identified for the licensee's failure to ensure that adequate preplanned measures for Emergency Plan Emergency Action Levels were in place when seismic monitoring instrumentation was out of service at various times in 2004 and 2005. The seismic monitoring equipment was required to ensure the prompt implementation of the River Bend Emergency Plan as required by 10 CFR 50.54(q) and the risk significant planning standard function,10 CFR 50.47(b)(4). The issue was entered into the licensee's corrective action program as CR-RBS-2006-01283.

  The finding was more than minor because it is associated with the procedure quality attribute of the Emergency Preparedness Cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. Utilizing the "Failure to Comply" flow chart in Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined that the finding was a failure to comply with an NRC requirement and was a Risk-Significant Planning Standard Problem involving a degraded Risk-Significant Planning Standard Function. The performance deficiency represents a degraded risk-significant planning standard function in that, during the periods that Reactor Mat Response Spectrum Recorder ERS-NBR2D or Free Field Seismic Trigger ERS-NBS4A were out of service, an existing Site Area Emergency emergency action level would not be declared. Based on the results of this evaluation, the finding was preliminarily determined to be of low to moderate safety significance (Section 1EP04).

REPORT DETAILS

Summary of Plant Status: The plant was shut down for Refueling Outage 13 during this inspection.

REACTOR SAFETY

Cornerstone: Emergency Preparedness

1EP04 Emergency Action Level (EAL) and Emergency Plan Changes

a. Inspection Scope

On January 15, 2006, during a review of a seismic monitor surveillance performed on November 10, 2005, conducted in accordance with Surveillance Test Procedure STP-557-4209, "Seismic Monitoring - Reactor BLDG MAT EL 70' 0", Triaxial Response Spectrum Recorder Channel Calibration Test (ERS-NBR2D, ERS-NBI101)," Revision 07D, the inspectors noted that the procedure required removal of Reactor Mat Response Spectrum Recorder ERS-NBR2D from service. Reactor Mat Response Spectrum Recorder ERS-NBR2D provides input to Control Room Annunciator P680-02A-B06, "Seismic Event High-High." This annunciator, in turn, is an initiating condition listed in Emergency Plan Implementing Procedure EIP-2-001, "Classification of Emergencies," Revision 12, Attachment 3, "Alert," EAL 14, "Severe Natural Phenomena Experienced Beyond Notification of Unusual Event Levels," and Attachment 4, "Site Area Emergency," EAL 13, "Severe Natural Event Near Site Being Experienced or Projected with Plant Not in Cold Shutdown."

The inspectors observed that the test procedure did not require, and the licensee had not taken any actions to ensure that, with Reactor Mat Response Spectrum Recorder ERS-NBR2D removed from service, the emergency response organization could identify the initiating conditions for an Alert or Site Area Emergency in an accurate and timely manner.

As a result of these observations, the inspectors reviewed work control records and control room and Technical Specification log entries for similar instances when seismic monitoring instruments were removed from service. The inspectors reviewed the River Bend Station Emergency Plan and Emergency Plan Implementing Procedures (EIP) to determine what actions should have been taken, reviewed condition reports (CRs), and questioned operators and members of the emergency preparedness staff with respect to the consequences of removing these instruments from service.

b. Findings

Introduction: The inspectors identified an apparent violation of 10 CFR 50.54(q) and 10 CFR 50.47(b)(4) for the failure of the licensee to ensure that adequate preplanned measures were in place for the accurate and timely classification of Emergency Plan EALs during periods when seismic monitoring instrumentation was out of service in 2004 and 2005.

Description: River Bend Station Procedure EIP-2-001, "Classification of Emergencies," Revision 12, described the initiating conditions under which seismic activity would require the declaration of a Notification of Unusual Event (NOUE), Alert, or Site Area Emergency (SAE). The initiating conditions for the various EALs related to seismic events, and the seismic monitors that provide input to the indications, are listed below:

Emergency Action Level	Initiating Condition	Seismic Monitor Input
Notification of Unusual Event		
Unusual Natural Events Near Site	Receipt of annunciators "Seismic Event High" (P680-02A-C06) AND "Seismic Tape Recording System Start" (P680-02A-D06)	Reactor Mat Seismic Switch ERS-NBS4B
		Free Field Seismic Trigger ERS-NBS4A
Alert		
Severe Natural Phenomena Experienced Beyond Notification of Unusual Event Levels	Receipt of annunciators "Seismic Event High-High" (P680-02A-B06) AND "Seismic Tape Recording System Start" (P680-02A-D06) AND Amber light(s) on Panel NBI-101	Reactor Mat Response Spectrum Recorder ERS-NBR2D
		Free Field Seismic Trigger ERS-NBS4A
		Reactor Mat Response Spectrum Recorder ERS-NBR2D
Site Area Emergency		
Severe Natural Event Near Site Being Experienced or Projected With Plant Not in Cold Shutdown	Receipt of annunciators "Seismic Event High-High" (P680-02A-B06) AND "Seismic Tape Recording System Start" (P680-02A-D06) AND Red light(s) on Panel NBI-101	Reactor Mat Response Spectrum Recorder ERS-NBR2D
		Free Field Seismic Trigger ERS-NBS4A
		Reactor Mat Response Spectrum Recorder ERS-NBR2D

The inspectors found that the licensee had removed seismic monitoring instrumentation from service on numerous occasions during 2004 and 2005 without providing adequate measures for the Operations Shift Manager, as Emergency Director, to assess plant

conditions against the criteria in EIP-2-001, “Classification of Emergencies,” Revision 12, for determining the appropriate EAL for a seismic event.

From January 19 to August 26, 2004, Free Field Seismic Trigger ERS-NBS4A was out of service for 216 days over a period of 220 days because of the planned demolition of concrete. Free Field Seismic Trigger ERS-NBS4A provides input to the “Seismic Tape Recording System Start” (P680-02A-D06) annunciator. (The seismic Tape Recording System records the output signals from four seismic accelerometers for postevent playback and analysis.) Thus, with this instrument out of service, the Operations Shift Manager could not have determined if a seismic event met the criteria for declaring a NOUE, Alert, or SAE using Emergency Plan Implementing Procedure EIP-2-001, “Classification of Emergencies,” Revision 12, Attachment 2, “Notification of Unusual Event;” Attachment 3, “Alert;” or Attachment 4, “Site Area Emergency.“ During this period that Free Field Seismic Trigger ERS-NBS4A was out of service, Reactor Mat Response Spectrum Recorder ERS-NBR2D was also out of service for a total of 20 days because of a planned surveillance in one instance and an instrument malfunction in another. Reactor Mat Response Spectrum Recorder ERS-NBR2D provides input to the “Seismic Event High-High” (P680-02A-B06) annunciator and the amber and red lights on Panel NBI-101. Thus, with this instrument out of service, the Operations Shift Manager could not have determined if a seismic event met the criteria for declaring an Alert or SAE using Procedure EIP-2-001, “Classification of Emergencies,” Revision 12, Attachment 3, “Alert” or Attachment 4,“Site Area Emergency.“

From July 29 to September 22, 2004, Reactor Mat Seismic Switch ERS-NBS4B was out of service for 35 days over a period of 55 days due to a failed surveillance in one instance and the discovery that a wrong part had been installed in another instance. Reactor Mat Seismic Switch ERS-NBS4B provides input to the “Seismic Event High” (P680-02A-C06) annunciator. Thus, with this instrument out of service, the Operations Shift Manager could not have determined if a seismic event met the criteria for declaring a NOUE using Procedure EIP-2-001, “Classification of Emergencies,” Revision 12, Attachment 2, “Notification of Unusual Event.”

The inspectors also found that between January 17 and March 2, 2005, Free Field Seismic Trigger ELS-NBS4A was out of service for 32 days in a 44-day period for maintenance; Reactor Mat Response Spectrum Recorder ERS-NBR2D was out of service for 16 days from October 25 to November 10, 2005, for a surveillance; and Reactor Mat Seismic Switch ERS-NBS4B was out of service for 22 days from February 8, 2005, to March 2, 2005, for a surveillance.

The inspectors determined that the River Bend Station Emergency Plan did not provide adequate instructions to the Operations Shift Manager or Emergency Director to make an accurate and timely EAL classification following a seismic event during the periods that seismic monitoring instrumentation was out of service. The inspectors noted, however, that each time the seismic monitoring instruments were out of service, the operators entered the appropriate Technical Requirements Manual (TRM) Limiting Condition for Operation. Technical Requirement 3.3.7.5, “Seismic Monitoring Instrumentation,” required that, with one or more seismic monitoring instruments

inoperable, actions be taken within 30 days to restore the affected monitor to operable status. If the affected instrument was not returned to service within 30 days, then Technical Requirement 3.3.7.5 directed personnel to initiate action to prepare an appropriate deficiency document. CR-RBS-2004-00823 was written on March 17, 2004, to document the inoperability of Free Field Seismic Trigger ERS-NBS4A. The condition report did not identify the impact that the inoperable instrument had on implementation of the River Bend Station Emergency Plan, and did not require any actions related to the condition. CR-RBS-2004-02712 was written on September 18, 2004, to document the inoperability of Reactor Mat Seismic Switch ERS-NBS4B. The CR did not identify the impact that the inoperable instrument had on implementation of the River Bend Station Emergency Plan and did not require any actions related to the condition.

Based on a review of licensee training material and interviews with plant personnel, the inspectors determined that Operations Shift Managers and Emergency Directors had not received training on how to implement the River Bend Station Emergency Plan and properly classify seismic events in a timely manner during periods when the seismic monitors were out of service. In addition, licensee procedures did not provide specific instructions on what criteria the Operations Shift Manager or Emergency Director should utilize to classify a seismic event during periods when seismic monitoring was out of service. The inspectors noted that personnel were not trained, nor direction provided, on methods to assess the magnitude of a seismic event during periods when seismic monitor Recorder ERS-NBR2D was out of service. The correlation between an Operating Basis Earthquake (OBE, ground acceleration of 0.05 g) and an Alert, and a Safe Shutdown Earthquake (SSE, ground acceleration of 0.1 g) and a SAE was not explained in licensee procedures. The licensee informed the inspectors that they believed there was sufficient guidance provided in the River Bend Station alarm response procedures, surveillance procedures, and Procedure EIP-02-001 (allowing the Emergency Director to use his own judgment in assessing plant conditions against the Emergency Plan EAL schemes) for the Operations Shift Manager or Emergency Director to make an accurate and timely event classification during the periods that these instruments were out of service. However, based on inspector interviews, three shift managers were unable to demonstrate that they would make the correct event classification if Recorder ERS-NBR2D was out of service.

The inspectors noted that NRC Information Notice 2005-19, “Effect of Plant Configuration Changes on the Emergency Plan,” issued on July 18, 2005, described instances in which licensees failed to properly evaluate the effect of plant configuration changes (procedures, equipment, and facilities) on the Emergency Plan, including the failure to identify the impact of equipment deficiencies on the Emergency Plan. The Notice stated that “Site configuration changes should be evaluated to ensure that the licensee continuously maintains the ability to implement an effective emergency plan. Configuration changes that impact the ability of a site to implement its emergency plan need to be evaluated to determine the impact and, if necessary, to implement compensatory measures.” The inspectors reviewed the licensee’s evaluation of NRC Information Notice 2005-19 documented in CR LO-OPX-2005-00241, Corrective Action 6. The licensee’s evaluation concluded that their plant modification process and procedure change process provided a cross-discipline review, including the emergency

preparedness organization, for any permanent plant equipment or procedure change. However, the licensee's evaluation did not address instances in which equipment was out of service for other planned or unplanned reasons.

The inspectors reviewed Condition Report LO-OPX-2004-00224, initiated on October 11, 2004, in which the licensee documented their evaluation of an emergency preparedness peer group recommendation that licensees evaluate conditions when instruments used to determine EALs are temporarily out of service for extended periods of time. Specific reference was made to an NRC finding at another site that a licensee removed a seismic monitor from service without evaluating its impact on the seismic event EAL classification scheme. In their evaluation, River Bend Station personnel stated that operators routinely contact the emergency preparedness staff when performing an operability and reportability review for CRs or when reviewing maintenance requests associated with equipment used to implement the Emergency Plan, and that significant equipment outages are identified and compensatory actions are built into the Emergency Plan Implementing Procedures, as needed. The inspectors noted that neither of these actions were taken during the periods that seismic monitoring instrumentation was out of service during the periods previously described.

In response to this finding, the licensee wrote Condition Report CR-RBS-2006-01283. The licensee stated that they did not agree with the inspectors' characterization of the issue and did not believe a violation of regulatory requirements had occurred. The licensee documented their position in "Regulatory Position Regarding Seismic Monitoring Instrumentation Allowed Outage Time," and provided a copy to the inspectors. The licensee's position paper is attached to this report.

In their position paper, the licensee concluded that they were confident that operators would implement existing site procedures, evaluate available seismic instruments, be sensitive to physical parameters, request site engineering assistance, and call upon offsite seismology resources enabling the station to determine the magnitude of an event and permit classification. They also believed that past performance served as validation, using existing Alarm Response Procedures, shift briefings, and physical indications of a seismic event, that appropriate actions would be taken to protect the plant as well as the health and safety of the public.

In their paper, the licensee stated that a seismic event is by nature a "self-revealing" event that the operators would have adequate indication of seismic activity and there would be alarms in the control room for oscillating pool levels. The Operations Shift Manager would then consult the seismic monitor alarm response procedures for the disabled instruments and would be directed to Procedure STP-557-3700, "Seismic Event Report," where guidance is given to consult with the National Earthquake Information Center. The Operations Shift Manager would then use the information provided to assess the severity of the seismic activity against the criteria for the Alert and SAE EALs.

In response to the inspectors' observations, the licensee contacted the National Earthquake Information Center and found that the information provided by the Center on the magnitude of seismic activity would be for the seismic epicenter location based on

the Richter Scale, which was not easily correlated to ground motion acceleration at River Bend Station. The inspectors also noted that there was no direct correlation between actual ground motion acceleration and the seismic event EALs in either Procedure EIP-02-001 or the seismic monitor alarm response procedures. In order for the Operations Shift Manager to make this correlation, he would have to know that the Alert EAL corresponds to an OBE and that an SAE corresponds to an SSE. He would then have to look up the definitions of OBE and SSE in the Updated Safety Analysis Report (USAR) and relate that data to the information provided from the National Earthquake Information Center. The inspectors determined that this effort would not meet the requirements of Emergency Plan Section 13.3.7, "Maintaining Emergency Preparedness," which states, in part, "The EIPs contain detailed information extracted from this plan and other pertinent documents. These procedures will enable station personnel to implement this plan and take proper action without referral to numerous documents." On April 11, 2006, Standing Order 194 was issued to provide specific guidance for the Operations Shift Managers to contact the National Earthquake Information Center following sensed seismic activity when the required seismic monitors were out of service and how to interpret the information provided with respect to the seismic event EAL criteria in Procedure EIP-2-001.

In their paper, the licensee stated that River Bend Station TRM Section 3.3.7.2, provided for a 30-day allowed outage time for the seismic monitoring instruments to perform maintenance or be removed from service. The TRM did not provide any specific actions to be taken while an instrument was out of service. The inspectors noted that the TRM action statement does not obviate the need to comply with 10 CFR 50.47(b)(4). The licensee also documented that the NRC has stated in Emergency Planning Position 1, dated June 1, 1995, that "Standard technical specifications allow a plant's seismic monitoring system to be out of service for days. In addition, loss of instrumentation does not represent a significant loss of assessment capability." The inspectors review of Emergency Preparedness Position No. 1 found that the NRC was stating that licensees could remove the requirement to enter a NOUE when seismic activity assessment capability is lost due to instrumentation being out of service and that it did not relate to the requirement to maintain the seismic event EAL scheme at all times, particularly with respect to the ability to classify seismic events at the Alert or SAE level.

The licensee's position paper also referenced Regulatory Guide 1.166, "Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Postearthquake Actions," dated March 1997, which described a method for evaluating on-site seismic activity to determine if an OBE has occurred when seismic instrumentation is not available. The licensee's position was that the NRC was acknowledging that seismic instrumentation was permitted to be out of service. The inspectors' reviewed the guidance provided by Regulatory Guide 1.166 for evaluating whether an OBE had occurred and determined that this guidance was provided to assist the licensee in determining whether or not the plant was required to be shut down following seismic activity greater than OBE. It did not provide guidance to assist licensees in making an accurate and timely emergency classification following a seismic event. The inspectors also noted that this guidance was not available in any station procedure, the USAR, or the Emergency Plan, and operators had not been trained on its use.

Analysis: The failure to provide adequate measures and instructions to enable the Operations Shift Manager or Emergency Director to make accurate and timely emergency classifications during periods when seismic monitoring instrumentation was out of service was determined to be a performance deficiency. The finding was more than minor because it is associated with the procedure quality attribute of the Emergency Preparedness Cornerstone objective to ensure that the licensee is capable of implementing adequate measures to protect the health and safety of the public in the event of a radiological emergency. The licensee's failure to reliably classify seismic events could result in the failure to adequately protect members of the public and nonemergency workers at River Bend Station and impacts offsite authorities' ability to implement measures to protect the health and safety of the general public. Utilizing the "Failure to Comply" flow chart in Manual Chapter 0609, Appendix B, "Emergency Preparedness Significance Determination Process," the inspectors determined that the finding was a failure to comply with an NRC requirement and was a Risk-Significant Planning Standard Problem involving a degraded Risk-Significant Planning Standard Function. The performance deficiency represents a degraded risk-significant planning standard function in that, during the periods that Reactor Mat Response Spectrum Recorder ERS-NBR2D or Free Field Seismic Trigger ERS-NBS4A were out of service, an existing EAL would not be declared for a Site Area Emergency. As a result, the finding was preliminarily determined to be of low to moderate safety significance (White).

Enforcement: Title 10 CFR 50.54 (q) requires, in part, that a licensee shall follow and maintain in effect emergency plans which meet the planning standards in Section 50.47(b). Risk significant planning standard 10 CFR 50.47(b)(4) requires that a standard scheme of emergency classification and actions levels be in use. Contrary to this, at various times in 2004 and 2005, the licensee failed to maintain a standard scheme of emergency classification and action levels in use. Specifically, River Bend Station failed to ensure that adequate preplanned measures were in place for evaluating the Emergency Plan EALs when seismic monitoring instrumentation was out of service. The licensee entered this issue into their corrective action program as CR-RBS-2006-01283. On April 11, 2006, Standing Order 194 was issued as an interim measure to provide specific guidance for the Operations Shift Managers to contact the National Earthquake Information Center following seismic activity and how to interpret the information provided against the seismic event EAL criteria of Procedure EIP-2-001, "Classification of Emergencies." This violation of 10 CFR 50.54(q), was identified as an apparent violation (AV 05000458/2006011-01), Failure to Maintain a Standard Scheme of Emergency Classification and Action Levels in Use.

4OA6 Meetings, Including Exit

On May 10, 2006, the inspectors presented the results of the inspection to Paul Hinnenkamp, Vice President - Operations, and other members of his staff who acknowledged the finding.

The inspectors confirmed that proprietary information was not provided by the licensee during this inspection.

ATTACHMENTS: SUPPLEMENTAL INFORMATION
LICENSEE POSITION PAPER

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

P. Hinnenkamp, Vice President - Operations
R. King, Director, Nuclear Safety Assurance
J. Leavines, Manager, Emergency Planning
D. Lorfing, Manager, Licensing
J. Miller, Manager, Training and Development
C. Stafford, Manager, Operations
D. Vinci, General Manager - Plant Operations

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000458/2006011-01	AV	Failure to Maintain a Standard Scheme of Emergency Classification and Action Levels in Use

LIST OF DOCUMENTS REVIEWED

Section 1EP04: Emergency Action Level and Emergency Plan Changes

Control Room Logs

Technical Specification (TRM) Entry Logs

Operations Standing Order 194, “Interim Actions for a Seismic Event with Seismic Instrumentation Out Of Service,” dated April 11, 2006

STP-557-3700, “Seismic Event Report,” Revision 03A

STP-557-4209, “Seismic Monitoring - Reactor BLDG MAT EL 70' 0", Triaxial Response Spectrum Recorder Channel Calibration Test (ERS-NBR2D, ERS-NBI101),” Revision 07D

Alarm Response Procedure, ARP-680-02, “P680-02 Alarm Response,” Revision 15A

EIP-2-001, “Classification of Emergencies,” Revision 12

River Bend Station Emergency Plan

River Bend Station USAR

System Training Manual - 557, Seismic Monitoring System

NRC Information Notice 2005-19, “Effect of Plant Configuration Changes on the Emergency Plan,” dated July 18, 2005

Regulatory Guide 1.12, “Nuclear Power Plant Instrumentation for Earthquakes,” dated March 1997

Regulatory Guide 1.166, “Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Post-Earthquake Actions,” March 1997

NRC Emergency Preparedness Position on Acceptable Deviations from Appendix 1 of NUREG 0654, based upon the Staff’s Regulatory Analysis of NUMARC/NESP-007, “Methodology for Development of Emergency Action Levels,” dated June 1, 1995

Condition Reports

CR-RBS-2006-01283	CR-RBS-2002-00483
CR-RBS-2004-00483	CR-RBS-2002-01723
CR-RBS-2006-00337	CR-RBS-2004-02712
CR-RBS-2004-00823	LO-OPX-2004-00142
CR-RBS-1991-00510	LO-OPX-2004-00224

LIST OF ACRONYMS

AV	apparent violation
CR	condition report
EAL	emergency action level
EIP	emergency plan implementing procedure
NOUE	Notification of Unusual Event
OBE	operating basis earthquake
SAE	site area emergency
SSE	safe shutdown earthquake
TRM	Technical Requirements Manual
USAR	Updated Safety Analysis Report

Regulatory Position Regarding Seismic Monitoring Instrumentation Allowed Outage Time

NRC has stated in an exit meeting that River Bend Station must have compensatory measures in place whenever the station removes from service any of its seismic monitoring equipment. Additionally, NRC stated that, Emergency Implementing Procedures are inadequate in that the appropriate EAL cannot be determined when the instrumentation is out of service given no compensatory action was implemented.

RBS is dedicated to fully and effectively implementing all elements of its Emergency Plan and procedures. During this inspection activity, NRC has identified areas where RBS believes enhancements could be made. RBS has improved the clarity and linkage of existing information within our Alarm Response Procedures, Emergency Implementing Procedures and Surveillance Test Procedures.

This position is being prepared to evaluate the regulatory implications of temporarily removing seismic monitoring equipment from service at River Bend Station (RBS) as allowed by TR 3.3.7.5 while complying with Required Action A.1. The station's Technical Requirements Manual (TRM) requires the instruments to be removed from service periodically for maintenance/testing.

RBS believes that the NRC positions referred to in this paper are taken with the knowledge that the allowed outage time for the seismic monitoring system used for Emergency Action Level (EAL) determination, would be subject to the requirements of a licensee's (RBS) TS or TRM.

Discussion

It should be recognized that a seismic event is by nature "self-revealing" and would cause plant operators to immediately initiate actions to assess the event by all means available. The Operating Bases Earthquake (OBE) and the Safe Shutdown Earthquake (SSE) are such that instrumentation would not be the only means to determine that an event of sufficient nature to be classified within the station's Emergency Action Level scheme has occurred.

EIP-02-001, Revision 13, "Classification of Emergencies" provides the following guidance:

- Event Category 'N', Emergency Action Level 10 – Unusual natural events near site (NOUE), Initiating Condition 1:
    - Receipt of annunciator "Seismic Event High (P680-02A-C06) AND
    - "Seismic Tape Recording System Start" (P680-02A-DO6)

- Event Category 'N', Emergency Action Level 14- Severe natural phenomenon experienced beyond Notification of Unusual Event levels (ALERT), Initiating Condition 1:

    - Receipt of annunciator "Seismic Event High-High" (P680-02A-B06) AND
    - "Seismic Tape Recording System Start" (P680-02A-D06) AND
    - Amber Light (s) on panel NBI-101

- Event Category 'N', Emergency Action Level 13 – Severe Natural Event Near Site Being Experienced or Projected with Plant Not in Cold Shutdown (SAE), Initiating Condition 1:

    - Receipt of annunciator "Seismic Event High-High" (P680-02A-B06) AND
    - "Seismic Tape Recording System Start" (P680-02A-D06) AND
    - Red light (s) on panel NBI-101

This guidance provides the expected instrumentation that may indicate a seismic event and allows classification of the event and in no way restricts the use of "felt" physical indicators of an event.

Existing Alarm Response Procedures coupled with Surveillances, provide sufficient information to enable the operators (Emergency Director) to contact the National Earthquake Information Center[1] and gain station engineering assistance as needed. The National Earthquake Center will provide specific information relative to the magnitude of an event to be used to aid in classification.

Additionally, Emergency Implementing Procedure, EIP-2-001, "Classification of Emergencies" contains the following guidance to an Emergency Director:

> *For Emergency Action Levels based on plant instrumentation, the indication shall be a valid indication. When all indications for a certain parameter have been lost, the Emergency Director should use his best judgment and other plant indications to classify the emergency (e.g., loss of level trend on all RPV level instrumentation).*

The station operations department past performance has demonstrated that the expected behaviors related to seismic event response could reasonably be expected to recur. For example, on November 3rd, 2002, the main control room received multiple alarms related to the upper and lower Spent Fuel Pool Cooling Pools (SFC). Alarms were also received for high suppression pool water level. Upon further investigation, it

[1] The National Earthquake Information Center and the USGS are essentially the same organization and can be used interchangeably.

was discovered that an earthquake was experienced near McKinley Park, Alaska at 5:12 PM EST.

The effect of this earthquake at RBS was limited to oscillations on the surface of holding tanks including the Suppression Pool, the Reactor Cavity/associated pools, and the Spent Fuel Pool.

The entire plant was walked down with particular attention being paid to Safety-Related systems. No abnormalities were found. The Seismic Monitoring System recorders did not start and no 'Seismic' alarms were received in the Main Control Room; therefore, the magnitude of this event was far less than the River Bend Operating Basis Earthquake (OBE) and Safe Shutdown Earthquake (SSE). Based on the plant walk down, absence of alarms, the Operability of plant equipment was not impacted by this condition and no EAL was determined to require entry.

Other examples of appropriate operator response to seismic monitoring/events demonstrate expected behavior; for example, Condition Report 2004-1630 details an instance when Alarm Number 567, “SEISMIC EVENT HIGH/HIGH” was received. Operators performed alarm response procedure actions (ARP), called the duty Engineering Supervisor, and contacted the seismic lab at the National Earthquake Information Center and verified that no seismic activity was recorded at St. Francisville, Louisiana.

RBS concedes that the time to classify a seismic event may in some instances take longer; however given the type of event, station procedures (ARPs, EIPs), available seismic instrumentation, physical cues and National Earthquake Information Center resources, the station would effectively implement appropriate EALs.

Position

The River Bend Station Emergency Plan and the implementing procedures were approved by the NRC and all subsequent changes have received appropriate reviews as required by regulations.

Subsection 50.47(b)(4) and Appendix E of 10 CFR Part 50 require licensees to develop an emergency classification scheme whose purpose is to initiate a minimum set of onsite and offsite emergency response actions commensurate with existing plant conditions and the trend of those conditions. RBS has developed and implemented this scheme.

Subsection 50.54(q) of 10 CFR Part 50 requires licensees to follow and maintain their emergency plans which meet the standards in 50.47(b) and the requirements of Appendix E. Thus, licensees are required to classify emergencies in accordance with their approved emergency classification schemes.

RBS has implemented its Emergency Plan requirements relative to EALs in Emergency Implementing Procedures (EIPs). EIP-2-001, Classification of Emergencies, contains guidance for the Emergency Director to use if available primary instrumentation is out of service. Specifically, Section 5.3 states:

> *"For Emergency Action Levels based on plant instrumentation, the indication shall be a valid indication. When all indications for a certain parameter have been lost, the Emergency Director should use his best judgment and other plant indications to classify the emergency (e.g., loss of level trend on all RPV level instrumentation)."*

RBS recognizes that the declaration may be more complicated due to out of service seismic instruments; however, the requirement to declare EALs ultimately will be satisfied[2]. Below is an excerpt from NRC position[3] stating clearly that the NRC staff recognizes that no explicit regulatory requirement exists related to time to classify an event and that availability of indications will start the time clock to classification:

> *"Although the regulations do not provide an explicit time limit for classifying emergencies, they do imply that classification should be made without delay. The ultimate goal of the classification scheme is to ensure that emergency response personnel and equipment are already in place if it becomes necessary to implement actions to protect the public health and safety. Therefore, if classification is not made promptly, following the availability of indications that an emergency condition exists, the goal of the classification scheme is undermined and the intent of the regulations would not be met."*
>
> The events in question (OBE and SSE) are of such a nature that instrumentation would not be the only means to determine that a seismic event requiring classification has occurred. The .05 g (OBE) event will be felt in the Main Control Room, as will the .10 g (SSE) event. This is sufficient to trigger the Operations Shift Manager (OSM) to pursue classification of the event even if the instrumentation is out of service. This method of classification is recognized within the more recent regulatory guidance provided to licensees as an acceptable alternative[4].

In the event the magnitude cannot be exactly determined, the EIP directs the Emergency Director (ED) to use his best judgment in making an EAL determination. It is reasonable to assume that the Alarm Response Procedures (ARP), physical

[2] NRC's position is that no specific time requirement exists to classify an event only that when indications are available the event will be classified (generally within 15 minutes of access to indications).
[3] EPPOS No. 2 dated August 1, 1995, Emergency Preparedness Position (EPPOS) on Timeliness of Classification of Emergency Conditions.
[4] Reg Guide 1.166, March 1997, Provides in Appendix 'A' that it is acceptable to use "felt" indicators backed by National Earthquake Information Center data.

indicators (felt motion, suppression pool wavelets, etc.) and training[5] would be used to estimate the size of the earthquake and an EAL selected.

The current Alarm Response Procedure provides information which will allow the OSM to contact the Earthquake Center to assist in determining the magnitude of the event (recognized in the license basis as off-site resources), at the site. The Center can provide this information for the site in the form of a magnitude. Guidance exists in the System Training Manual as to the comparison of the magnitude of an earthquake and its associated range of ground acceleration values. Assistance from Engineering or other sources could also be obtained to assess and classify the event.

Using newer NRC and industry guidance[6], it is reasonable to conclude that the exact magnitude of the event is not as important initially as the fact that an event did occur. NRC has endorsed this new guidance that would expect actual determination of an OBE to take up to 4 hours or more. Therefore, this condition alone should not constitute the inability to declare an EAL.

River Bend Station has implemented the Required Actions of TR 3.3.7.5 and is in full compliance with its requirements. Historical NRC policies recognize that licensees will take seismic monitoring equipment out of service in accordance with their license bases and this is acceptable.

NRC Emergency Preparedness Position (EPPOS) on acceptable deviations from Appendix 1 of NUREG-0654 based upon the staff's regulatory analysis of NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels", allows, among other things, the deletion of a NOUE classification for loss of seismic instrumentation. The basis is that: "Standard technical specifications allow a plant's seismic monitoring system to be out of service for days. In addition, loss of this instrumentation does not represent a significant loss of assessment capability." These statements link the out of service time for the seismic monitoring system used for EAL determination, to the requirements of the current TRM section on seismic instruments (formerly part of the Technical Specifications).

In view of the presented information, we believe that no regulatory basis exists for issuance of a violation for this equipment having been out of service as allowed by the Required Action time of TR 3.3.7.5. The NRC EPPOS establishes that the basis for seismic monitoring instrumentation allowed outage time is the TRM as implemented by RBS. Therefore, RBS does not believe that this would constitute a violation with a significance of greater than green.

Regulatory Bases

[5] RBS System Training Manual provides instruction on how to classify seismic events given various common measures of magnitude. Operators have been trained on this activity and the information is readily available.

[6] Regulatory Guide 1.166 dated 1997

EAL BASIS

Federal Regulations dictate that River Bend Station must develop and implement an Emergency Plan.

Key regulatory requirements are provided below:

- 10CFR50.54 (q) "A licensee authorized to possess and operate a nuclear power reactor shall follow and maintain in effect emergency plans which meet the standards in § 50.47(b) and the requirements in appendix E of this part [...]

- 10CFR50.47 (b) (4) "A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee, and State and local response plans call for reliance on information provided by facility licensees for determinations of minimum initial offsite response measures."

RBS responded to specific questions from NRC during their review of the station's Emergency Plan (then a part of the SAR).

The station has implemented its Emergency Plan requirements relative to EALs in Emergency Implementing Procedures (EIPs). EIP-2-001, Classification of Emergencies, contains guidance for use by the Emergency Director if available primary instrumentation is out of service. Specifically, Section 5.3 states

> *"For Emergency Action Levels based on plant instrumentation, the indication shall be a valid indication. When all indications for a certain parameter have been lost, the Emergency Director should use his best judgment and other plant indications to classify the emergency (e.g., loss of level trend on all RPV level instrumentation)."*

Seismic Monitoring Basis

During initial licensing activities, NRC reviewed and approved the seismic monitoring instruments at RBS. The depth of this review is evidenced by the questions and answers some of which are provided below for demonstrative value.

> River Bend Station FSAR Amendment 8 Question 810.32:
>
> *"The plan does not adequately describe […] Geophysical phenomena monitors (h.5.a) […] referred to in Section 13.3.6.3.1*
>
> Response:

"The response to this request is provided in revised Section 13.3.6.3.1."

Section 13.3.6.3.1, *"The seismic instrumentation at the station is utilized to monitor and record […] complies with Regulatory Guide 1.12. […]"*

Changes made were also included on Amendment 8, Table 13.3-8 listing the monitors and their applicability.

River Bend Station FSAR Amendment 8 Question 810.33:

"The capability to acquire or have access to offsite seismic and hydrological data is not addressed. (H.6.a)"

Response:

Seismic and hydrological data are available to GSU through the offices of the U.S. Army Corps of Engineers in New Orleans, Louisiana and the U. S. Geological Survey[7] in Baton Rouge, Louisiana.

Allowed Outage Time as Applied to Seismic Monitoring

In Regulatory Guide 1.12, Revision 1, NRC provides a position requiring seismic monitoring instrumentation. NRC goes on to state that Paragraph (c) of 10 CFR 50.36, Technical Specifications, requires that the technical specifications include surveillance requirements to assure that the necessary quality of systems and components is maintained, that the facility operations will be within safety limits and that the limiting conditions for operations (LCO) will be met. The 10 CFR Part 100, Appendix 'A', Seismic and Geological Siting Criteria for Nuclear Power Plants, also describes the instrumentation acceptable to the Regulatory Staff. This scheme was implemented and approved by NRC at RBS[8].

Upon NRC approval, RBS implemented the Technical Specification 3.3.7.2, Seismic Monitoring Instrumentation. An excerpt is below:

Limiting Condition for Operation

3.3.7.2 - The Seismic monitoring instrumentation shown in Table 3.3.7.2-1 shall be operable.

ACTION:

"a. With one or more of the above required seismic monitoring instruments

[7] USGS and National Earthquake Information Center are used interchangeably.
[8] RBS USAR Section 3.7.4.1A states that seismic monitoring instrumentation complies with RG 1.12.

inoperable for more than 30 days, prepare and submit within the next 10 days a Special Report to the Commission, pursuant to Specification 6.9.2, outlining the cause of the malfunction and the plans for restoring the instrument(s) to OPERABLE status."

With implementation of Improved Technical Specifications, the station relocated the seismic monitoring requirements to the Technical Requirements Manual (TRM) with a License Amendment Request (LAR). Below is the relocated specification discussion approved by NRC[9]:

"R.1 The seismic monitoring instrumentation provides information only and is not considered in any design basis accident or transient. It does provide information regarding the severity of an earthquake; however, the evaluation summarized in NEDO-31466 determined the loss of this instrumentation to be a non-significant risk contributor to core damage frequency and off-site release. Therefore, the requirements specified for this function did not satisfy the NRC Interim Policy Statement technical specification screening criteria as documented in the Application of Selection Criteria to the RBS TS and have been relocated to plant documents controlled in accordance with 10 CFR 50.59."

Given the Action Statement of the TS (now TRM), RBS has 30 days to perform maintenance or otherwise take out of service the seismic monitors. Additionally, the requirements allow separate entry for each channel. The TRM[10] does not provide any specified actions to be taken while an instrument is out of service.

Absent any specific regulatory guidance contained within the TRM, RBS reviewed applicable NRC positions.

- In EPPOS No. 1[11], NRC prepared a position providing guidance to the staff on the acceptability of proposed emergency action level (EAL) revisions when those revisions depart from the guidance in Appendix 1 of NUREG-0654.

  Unusual Event #11 ...significant loss of assessment...all meteorological instrumentation

  Basis: Due to the shift in emphasis from classification based upon dose assessment to classification based upon plant conditions […] For licensees who have incorporated the loss of seismic monitoring instrumentation as an Unusual

[9] The relocation essentially moved the requirements from the Technical Specifications to the Technical Requirements Manual unchanged.

[10] RBS USAR Section 3.7.4A states that surveillance requirements for seismic instrumentation are listed and controlled by the RBS Technical Requirements Manual (TRM).

[11] EPPOS Number 1, dated June 1, 1995, This paper provides examples of some of the acceptable changes that licensees may make based upon the staff's current understanding of the thresholds of the four emergency classes.

Event, this EAL may also be eliminated. Standard technical specifications allow a plant's seismic monitoring system to be out of service for days. In addition, loss of this instrumentation does not represent a significant loss of assessment capability.

- Regulatory Guide 1.12, Revision 2,[12] Nuclear Power Plant Instrumentation for Earthquakes, dated March 1997, provides an additional data point that demonstrates NRC's recognition that seismic monitors may be out of service. SEE below:

  An NRC staff evaluation of seismic instrumentation noted that instruments have been out of service during plant shutdown and sometimes during plant operation […] If the seismic instrumentation or data processing hardware and software necessary to determine whether the OBE has been exceeded is inoperable, the guidelines in Appendix A to Regulatory Guide 1.166 should be used […]

  Regulatory Guide 1.166, March 1997 states in Section 4.4:

  Inoperable Instrumentation or Data Processing Hardware or Software

  If the response spectrum and the CAV (Regulatory Positions 4.1 and 4.2) cannot be obtained because the seismic instrumentation is inoperable, data from the instrumentation are destroyed, or the data processing hardware or software is inoperable, the criteria in Appendix A to this guide should be used to determine whether the OBE has been exceeded.

  Regulatory Guide 1.166, March 1997, Appendix 'A':

  For plants at which no free-field or foundation-level instrumental data are available, or the data processing equipment is inoperable […] the OBE will be considered to have been exceeded and the plant must be shut down if one of the following applies:

  1. *The earthquake resulted in Modified Mercalli Intensity[13] (MMI) VI or greater within 5 km of the plant,*
  2. *The earthquake was felt within the plant and was of magnitude 6.0 or greater, or*
  3. *The earthquake was of magnitude 5.0 or greater and occurred within 200 km of the plant.*

  A post earthquake plant walkdown should be conducted after the earthquake.

[12] RBS is not committed to this revision; however, this example clearly supports that NRC understands that seismic monitors are at times out of service for various reasons; one of which would be per the TRM.
[13] Modified Mercalli Intensity is based upon subjective criteria that are non-scientific; for example: people awakening, furniture moving, damage to chimneys, etc. The data is gathered post-earthquake and tabulated. The epicenter is where the observed intensity generally occurs (USGS sourced information).

Note: *The determinations of epicenter location, magnitude, and intensity by the U.S. Geological Survey, National Earthquake Information Center, will usually take precedence over other estimates; however, regional and local determinations will be used if they are considered to be more accurate. Also, higher quality damage reports or a lack of damage reports from the nuclear power plant site or its immediate vicinity will take precedence over more distant reports.*

RBS believes that these referenced NRC positions are taken with the knowledge that the allowed outage time for the seismic monitoring system used for EAL determination, would be subject to the requirements of a licensee's (RBS) TS or TRM. This then establishes the TRM as the basis for allowed outage time.

Complying with TLCO 3.3.7.5, Condition 'A', Required Action A.1, instruments can be out of service for up to 30 days (each channel). Should the need to exceed 30 days arise, an appropriate action to be taken would be the initiation of a corrective action document (CR).

Conclusion

RBS is confident that operators would implement existing site procedures (ARPs, EIPs, STPs), evaluate available seismic instruments, be sensitive to physical parameters (felt motion, tanks levels, pool level, etc.), request site engineering assistance, and call upon offsite seismology resources enabling the station to determine the magnitude of an event and permit classification.

Additionally, RBS believes that the station's past performance serves as validation that using existing Alarm Response Procedures, TRM TLCO status (shift briefings), and "felt" physical indicators of a seismic event, that appropriate actions will be taken to protect the plant as well as the health and safety of the public. In 2002, operations demonstrated that when suspected seismic events have occurred, they have called the offsite seismic labs for validation[14], initiated condition reports and have conducted appropriate investigations to ensure plant and public safety.

[14] **CR 2002-1723 -** This Condition regards the effects felt at River Band Station from a Magnitude 7.9 earthquake near McKinley Park, Alaska. The effect of this earthquake at RBS was limited to oscillations on the surface of holding tanks including the Suppression Pool, the Reactor Cavity and associated pools, and the Spent Fuel Pool. The entire plant has been walked down, paying particular attention to all Safety-Related systems. No abnormalities have been found. The Seismic Monitoring System did not start and no 'Seismic' alarms were received in the Main Control Room; therefore, the magnitude of this event was far less than the River Bend Operating Basis Earthquake and Safe Shutdown Earthquake. Based on the plant walk down, absence of alarms, the Operability of plant equipment is not indicted by this condition.