UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

November 2, 2004

Florida Power and Light Company
ATTN: Mr. J. A. Stall, Senior Vice President
Nuclear and Chief Nuclear Officer
P.O. Box 1400
Juno Beach, FL. 33408-0420

SUBJECT: NRC INSPECTION REPORT NO. 50-250/2004-011, AND 50–251/2004-011

Dear Mr. Stall:

On October 4-8, 2004, the U. S. Nuclear Regulatory Commission (NRC) completed a PI&R Selected Issues Followup Inspection at Turkey Point, the enclosed report documents the inspection findings, which were discussed on October 7, 2004, with Mr. Terry Jones, Site Vice President, and other members of your staff during an exit meeting on October 7, 2004.

This inspection was an examination of activities conducted under your license as they relate to the identification and resolution of problems, and compliance with the Commission's rules and regulations and the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and representative records, observation of activities, and interviews with personnel.

On the basis of the sample selected for review, the inspectors concluded that in general, problems were properly identified, evaluated, and corrected. There were four green findings identified during this inspection associated with configuration control of Westinghouse Hagan modules during repair and refurbishment activities. The first finding involved failure to implement adequate test controls for time response tests of Hagan replacement modules. The second finding was failure of the Instrumentation and Control (I&C) technicians to use adequate I&C procedures for repair and refurbishment of Hagan modules. The third finding involved failure to establish adequate corrective action to preclude the use of an unqualified capacitor in safety related applications. The fourth finding involved a licensee identified finding in connection with changes made to Hagan modules during disposition of Condition Reports (CRs). These findings were determined to be violations of NRC requirements. However, because they have very low safety significance and because they have been entered into your corrective action program, the NRC is treating these findings as non-cited violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny any of these non-cited violations, you should provide a response with the basis for your denial, within thirty days of the date of this inspection report, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D. C. 20555-0001, with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, D. C. 20555-0001; and the NRC Resident Inspector at the Turkey Point facility.

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 Publically Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

\\RA by Larry Mellen For \\

Charles R. Ogle, Chief
Engineering Branch 1
Division of Reactor Safety

Enclosure: NRC Inspection Report 05000250/2004011 and 05000251/2004011 w/Attachment: Supplemental Information

Docket Nos.: 50-250, 50-251
License Nos.: DPR-31, DPR-41

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U. S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket Nos. :	50-250, 50-251
License Nos. :	DPR-31, DPR-41
Report No. :	05000250/2004011 and 05000251/2004011
Licensee. :	Florida Power & Light Company (FPL)
Facility. :	Turkey Point Nuclear Plant, Units 3 and 4
Location. :	9762 S. W. 344th Street Florida City, FL 33035
Dates:	October 4-8, 2004
Inspectors:	C. Smith, P. E. , Senior Reactor Inspector L. Cain, Resident Inspector, V. C. Summer
Approved by:	C. Ogle, Chief Engineering Branch 1 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000250/2004-011, 05000251/2004-011; 10/04-08/2004; Turkey Point Nuclear Plant Unit 3 and 4; Identification and Resolution of Problems-Selected Issue Followup Inspection.

This inspection was conducted by a regional inspector and a resident inspector. The inspectors identified 3 NRC or self revealing findings of very low safety significance which were classified as non-cited violations. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be green or be assigned a severity level after 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 (NCV) of 10 CFR 50 Appendix B, Criterion XI, Test Controls, for inadequate test controls. These controls were associated with tests developed and implemented for demonstrating that replacement safety-related multiplier/divider cards and peripheral amplifiers manufactured by NUS, were acceptable like-for-like replacement of Hagan components in the analog computer and for time response tests performed by the licensee for the original Hagan square root module and the summator module with 10- and 39-micro farad capacitors. The licensee entered this issue into their corrective action program as 2004-10337-CR, for tracking the development of approved test procedures and completion of response time testing.

This finding is greater than minor because inadequate test controls could result in an inadequate test of equipment in the mitigating system cornerstone and thereby result in improper equipment operation. This could result in plant operation outside of analyzed conditions. Such operation could affect the availability, reliability, and capability of mitigating systems to respond to initiating events and prevent undesirable consequences. This finding is of very low safety significance because it did not result in a loss of system function per Generic Letter 91-18. (Section 4OA2.c(2)(a))

Green. An NCV of 10 CFR 50 Appendix B, Criterion V, Instructions, Procedures and Drawings, was identified by the inspectors for the licensee's failure to prescribe by documented instructions or procedures of a type appropriate to the circumstances, activities associated with refurbishment and/or repair of reactor protection system circuit components. Specifically, technicians were using uncontrolled, unreviewed and unapproved checklists, as well as uncontrolled Excel spreadsheets, in order to affect repairs and refurbishment to Hagan modules associated with safety-related functions in the reactor protection system. The licensee entered this issue into their corrective action program as 2004-10337-CR, for the evaluation, benchmark and drafting of more formal instructions for the conduct of the Hagan Repair Program.

This finding is greater than minor because inadequate procedures which are used to repair and refurbish Hagan modules could result in changes to the performance characteristics of equipment in the mitigating system cornerstone that are less conservative than the original equipment manufacturer's (OEMs) specifications. Such changes, e.g., time response, could result in plant operation outside of analyzed conditions and could affect the availability, reliability, and capability of mitigating systems to respond to initiating events, and prevent undesirable consequences. This finding is of very low safety significance because it did not result in a loss of system function per Generic Letter 91-18. (Section 4OA2.c(2)(b))

Green. An NCV of 10CFR50 Appendix B, Criterion XVI, Corrective Action, was identified by the inspectors for the licensee's failure to take adequate corrective action to preclude the use of an inadequately evaluated alternate replacement capacitor. This issue was entered into the licensee's corrective action program as 2004-10324-CR, to revise the Instock Disposition Status of Passport Evaluation 080201, Stock Code 0003546-2, to ensure that the capacitor cannot be used for Hagan modules.

This finding is greater than minor because the licensee's actions to preclude the use of an unqualified capacitor in safety-related applications were not sufficient to prevent an I&C technician from requesting it from the stores. The part was listed as acceptable for use in the vendor technical manual, and was available from stores. The use of this unqualified capacitor in equipment in the mitigating system cornerstone could result in changes to equipment performance characteristics, and result in plant performance outside of analyzed conditions. Such operation could affect the availability, reliability, and capability of mitigating systems to respond to initiating events and prevent undesirable consequences. This finding is of very low safety significance because it did not result in a loss of system function per Generic Letter 91-18. (Section 4OA2.c(2)(c))

B. Licensee-Identified Violations

A violation of very low safety significance, which was identified by the licensee, was reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action are listed in Section 4OA7 of this report.

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA2 Problem Identification and Resolution

a. Effectiveness of Problem Identification

(1) Inspection Scope

The inspectors reviewed items selected across one strategic performance area, Reactor Safety, to determine if problems associated with safety-related Hagan modules were being properly identified, appropriately characterized, and promptly being entered into the corrective action program (CAP) for evaluation and resolution. The inspectors reviewed program documents including the current version (Revision 1) of Nuclear Administrative Procedure (NAP)-204, "Condition Reporting," and NAP-400 (Revision 1), "Condition Reports," which described the administrative process for documenting and resolving problems. The inspectors also reviewed other program documents including Nuclear Engineering Quality Instruction (QI)-2.5, (Revision 17), "Condition Reports," Nuclear Engineering QI-1.0 (Revision 19), "Design Control," and Nuclear Engineering QI-2.3 (Revision 6), "Operability Determinations.

The inspectors reviewed a sampling of CRs associated with Hagan modules that had been generated from early 1992 through September 2004. The CRs reviewed are listed as an attachment to the report. The licensee provided CRs related to specific Hagan module design changes as well as a Westinghouse Report WNA-AR-00005-FPL, Rev. 0, "Evaluation of Changes to Safety-related 7100 System Modules," for FP&L Turkey Point Units 3 & 4. The inspectors reviewed Plant Work Orders (PWOs) and associated CRs to verify equipment problems were being entered into the CR database in accordance with procedure requirements. The inspectors held discussions with plant personnel and the NRC resident inspectors to determine if problems were properly identified. The inspectors reviewed plant equipment issues associated with maintenance rule (a)(1) items, functional failures, maintenance preventable functional failures (MPFFs), and repetitive MPFFs, to verify that maintenance rule equipment deficiencies associated with Hagan modules were being appropriately entered into the CAP. The inspectors reviewed current trend reports for CR initiation rates before and after SITRIS implementation. (Condition Reports (CRs), which utilize the Station Issue Tracking and Information System (SITRIS) software as a computerized processing and tracking tool, remain the primary means for documenting problems).

The inspectors also reviewed the licensee's process for evaluating degraded and non-conforming conditions pursuant to the requirements of Generic Letter 91-18.

The inspectors toured the control room, including portions of the reactor protection system equipment racks which contained the majority of safety-related Hagan modules to determine whether equipment and material condition problems were being identified. In addition, the inspectors carefully reviewed the Apparent Cause CR 2004-5067 Final

Report, “Concerns Relating to Configuration Control of Westinghouse Hagan Modules,” dated July 28, 2004; the Quality Assurance (QA) Assessment report 04-0069 titled, “Hagan Module Repair and Refurbishment,” dated September 02, 2004; as well as the associated CRs generated as a result of these audits. This included CRs 2004-5414, 5430, 5560, 5637, 7161, 7824, 7947, 8172 and 2004-8224. The inspectors evaluated the assessment’s effectiveness in identifying problems in the hagan module repair and refurbishment process and compared the results of the licensee’s efforts with the inspectors’ findings and observations.

(2) Assessment

The inspectors determined that the licensee was effective at identifying problems associated with Hagan modules and entering them into the CAP. The inspectors noted instances where program enhancements could, and should be made with the understanding that the CAP was presently undergoing transition to a new electronic based corporate level program that would be applicable to all the licensee’s facilities. The inspectors also found the licensee's process for evaluating degraded and non-conforming conditions to be adequate.

The inspectors determined that in general, licensee audits and assessments were of sufficient depth, and identified issues similar to those that were self-revealing or raised during previous NRC inspections. The inspectors did note, however, that PTN Nuclear Assurance Quality Report, QRNO 04-0069, Hagan Module Repair and Refurbishment, dated 02 September, 2004, failed to identify the use of uncontrolled, unreviewed and unapproved checklists as well as uncontrolled Excel spreadsheets used to make repairs and refurbishment to Hagan modules associated with safety-related functions in the reactor protection system. This issue is discussed further in Section 4OA2.c(2) b, of this report.

During this inspection, there were no instances identified where conditions adverse to quality were being handled outside the corrective action program. The inspectors determined, however, that language contained in Nuclear Engineering Quality Instruction ENG-QI- 2.5, “Condition Reports,” Revision 17, would permit craft personnel to make permanent plant changes to safety-related equipment outside of the design control process. Two instances were noted where design changes were implemented using the CR process. Condition Report (CR) 97-0590 inadvertently made design changes to a proportional, integral, derivative (PI&D) controller by installing jumpers to convert the PI&D controller to purely proportional. The wiring changes were the corrective actions for resolving an operational amplifier overload problem. Additionally, CR 96-1590 changed the lag value of lead-lag controller PM-4-446 to 1 second. The corrective action was intended to prevent spurious rod insertion after changes to turbine load. Both of these issues are discussed further in Section 4OA7.b of this report.

b. Prioritization and Evaluation of Issues

(1) Inspection Scope

The inspectors reviewed a sample of corrective action and evaluation documents to determine if the licensee appropriately prioritized and evaluated various issues associated with Hagan modules and entered them into the CAP for evaluation and resolution. A sample of corrective action documents was selected with a focus on issues related to Hagan modules. Specific documents reviewed included CRs 2004-2591 (FCV-4-478), 2003-3989 (FCV-3-498), 2002-0105 (LT-3-494), 2004-5430 (Item Equivalency Evaluation (IEE) Self-Assessment), 2001-0926 (Field Wiring Discrepancy), IEE 037258 (Hagan Capacitor Alternate Replacement), IEE 080201 39 (Micro-Farad Capacitor Evaluation), 2001-2369 (TM-108 Spurious Alarms), 2000-0039 (Summator PM-3-464B OOC), 1997-0814 (Comparator PC-4-455C Setpoint Low OOS).

The inspectors reviewed selected CRs which documented the licensee's analysis of the reliability of the Hagan modules. The analysis was performed in order to see if there was any correlation between failure rate and design/component changes or maintenance activities.

(2) Assessment

The inspectors determined that the licensee was generally effective in prioritizing and evaluating issues commensurate with their safety significance. However, CR 2004-5430, Item Equivalency Evaluations (IEE) Self-Assessment, identified that several IEEs had inadequate technical justifications for the replacement components. For example, IEE-037258 inadequately evaluated an alternate replacement capacitor having a different value and tolerance from the original capacitor as a suitable alternate replacement part. The initial equivalency evaluation did not address the potential impact on time response of the circuit due to an increased tolerance band. This is discussed further in Section 4OA2.c(2) c of this report.

The inspectors determined that the licensee's analysis of the reliability of the Hagan modules identified a higher failure rate than industry average for the steam flow and feed water flow square root (computer) modules. This determination was made based on comparison of industry data and the licensee's operating experience with failures of the square root modules. Five of eight failures of the square root modules over an eighteen-month period were attributed to human errors. Corrective actions implemented for these failures were effective. Since 1992, there have been only three failures attributed to maintenance activities, and one failure attributed to be the result of a design/component change. The licensee also identified twelve failures of the comparator modules over an eight-year period from 1996 to 2004. The failure mode of the comparators was failure of the module power supply filter capacitor, which results in unfiltered AC voltage being applied to the module's electronic circuit. The licensee has determined that existing corrective actions to address this concern have not been

effective, and CR 2004-7424 has been issued to determine the effectiveness of the current preventive maintenance program for Hagan comparator modules and to develop recommendations for improvement.

The results of the licensee's analysis demonstrated that overall, the reliability of the Hagan modules had been good. The inspectors concluded that the licensee's analysis of the reliability of the Hagan modules was thorough, and the corrective actions developed and implemented for equipment failures were generally effective in providing recurrence control.

c. Effectiveness of Corrective Actions

(1) Inspection Scope

The inspectors reviewed CRs which documented deficiencies related to configuration control of Westinghouse Hagan modules in order to verify that the licensee had identified and implemented corrective actions commensurate with the safety significance of the documented issues. Where possible, the inspectors also evaluated the effectiveness of the actions taken. The inspectors verified that common causes and generic concerns were addressed where appropriate. The inspectors also reviewed a QA surveillance report, QRNO: 04-0069, Hagan Module Repair and Refurbishment, and the related CR 2004-716, in order to evaluate the effectiveness of the licensee's self assessment. This QA surveillance evaluated activities associated with the repair and refurbishment of Westinghouse Hagan modules by I&C maintenance technicians.

The inspectors also reviewed and evaluated the corrective actions listed in CR 2004-5067, for resolution of concerns regarding the configuration control of Westinghouse 7100 Hagan modules, used in quality related and safety-related instrument circuits. The corrective actions were developed by the licensee based on a review of CRs, PC/Ms, IEEs and vendor manual changes.

(2) Assessment

The licensee investigation of the configuration control of Westinghouse Hagan modules included reviews of CRs, PC/Ms, IEEs and vendor manual changes to determine if on-site repairs and/or refurbishment of Hagan modules adversely affected the ability of the modules to perform their design function. The scope of the licensee's investigation included the entire population of Hagan modules. The licensee's review, identified cases where changes to instrumentation loops response time were not adequately or thoroughly addressed. The licensee attributes this to the fact that response time tests are not a part of the plant's licensing condition, and engineering personnel are generally not aware of the response time requirements for safety-related rack instrumentation. The licensee performed engineering evaluations of these cases and determined that there was no impact on the ability of the safety-related modules to perform their safety-related function or to satisfy RPS/ESFAS time response requirements. The inspectors on a sample basis, verified that changes to the steam flow/feed water flow mismatch

instrument loop circuit were still bounded by the Westinghouse specified bounding values despite changes to instrument loop modules. The inspectors identified no deficiencies from this evaluation. Additionally, the inspectors reviewed the corrective action plans developed by the licensee for resolution of the configuration control issue involving Westinghouse Hagan modules. The corrective actions were adequate in that they addressed the identified apparent causes of the problem, and provided recurrence control.

Inadequate Tests of Hagan Replacement Modules

(a) Finding

The inspectors identified an NCV of 10 CFR 50 Appendix B, Criterion XI, Test Controls, for inadequate test controls. These controls were associated with tests developed and implemented for demonstrating that replacement safety-related multiplier/divider cards and peripheral amplifiers manufactured by NUS, were acceptable like-for-like replacement of Hagan components in the analog computer, and for response time tests performed by the licensee for the original Hagan square root module and the summator module with 10-and 39-micro farad capacitors.

Description

The licensee determined that safety-related multiplier/divider cards and peripheral amplifiers manufactured by NUS Scientific and which were used as like-for-like replacement for Hagan modules in the analog computer module impacted the response time of the associated instrument loop. This Hagan module replacement manufactured by NUS performs a safety-related reactor protection function, in that it continuously calculates the steam flow or feed water flow rates and applies a proportional signal to the steam flow feed flow comparators. The relays associated with the comparators provide a trip signal to the reactor protection system. The licensee obtained the results of response time tests of the amplifier and multiplier/divider cards from NUS, and based on evaluation of the results concluded that the aggregate time delay caused by the replacement cards would be no more than 200 milliseconds for the complete analog computer module. However, the licensee was unable to do a quantitative evaluation of the time response of the original Hagan module versus the NUS safety-related multiplier/divider cards and peripheral amplifiers, because of a lack of time response data for the Hagan module.

The licensee performed response time tests of the NUS safety-related multiplier/divider cards and peripheral amplifiers and the Hagan original module in order to obtain quantitative data for their evaluation. The inspectors identified a concern with the test controls that were implemented during conduct of these tests. Specifically, the inspectors determined that the response time tests were not performed in accordance an approved test procedure which clearly delineated the following:

Test Prerequisites
Test Precautions and Limitations
Test Acceptance Criteria
Test Instructions
Identification and Resolution of Test Deficiencies.

The licensee also evaluated response time changes to the summator with limiters, and the summator without limiters, which resulted from the inadequate disposition of CR 97-0689. This CR modified a Hagan summator that could be used in the high steam flow protection and high steam header protection portions of ESFAS. This change involved installation of a small 0.01-microfarad capacitor (C28) in the summator module in accordance with the schematic drawing in the vendor technical manual. The CR also describes changes to the C4 capacitor of the summator module which was changed from 10 microfarads to at least 30-microfarads. This change was approved by Westinghouse for the summator with limiters (Model 4111084-004) and was never approved for summators without limiters (Model 4111084-001).

In order to demonstrate the acceptability of the changes made to the summators with limiters and without limiters, the licensee performed response time tests on both summators using both size capacitors. The inspectors identified concerns with the test controls implemented for these tests that are similar to those identified above for the NUS safety-related multiplier/divider cards and peripheral amplifiers and the original Hagan module.

Westinghouse evaluated the changes made to the summators without limiters and determined that they were acceptable based on the time response tests completed by the licensee and which is documented in CR 2004-5637. Westinghouse's conclusions are documented in WNA-AR-00005-FPL, Evaluation of Changes to Safety-related 7100 System Modules, Revision 0, dated September 2004. The licensee state that the changes to summators without limiters are acceptable, based on Westinghouse acceptance of the time response tests completed by the licensee. Additionally, the licensee in their Operability Assessment of Hagan Reconfigured Modules, Revision 1, credits Westinghouse's evaluation with demonstrating the operability of instrument loops having the summators with limiters installed.

The inspectors concluded that the test controls used for conducting the response time tests for the summators with and without limiters were not performed in accordance with the licensee's 10 CFR 50 Appendix B, Program. Based on the inspectors review of WCAP-14036, the inspectors determined that the change in capacitance values that the licensee made to capacitor C4 was not bounded by the change in capacitance value of capacitor C4 in the summators, that was tested by Westinghouse in their FMEA of the summators. The inspectors concluded, however, that there was reasonable assurance that the response time of the summator modified by the licensee had not changed appreciably, and the licensee needs to demonstrate that the response time was still bounded by the 20-millisecond bounding response time identified in the Westinghouse document (WCAP-14036).

The inspectors also verified from a quantitative evaluation of the response time for the steam flow/feed flow mismatch with a low steam generator level reactor trip instrument loop, where the NUS safety-related multiplier/divider cards and peripheral amplifiers are used, that an operability concern does not exist because the aggregate loop response time was still bounded by Westinghouse's two second maximum reactor trip time delay.

Based on the above, the inspectors concluded that objective evidence reviewed by the inspectors did not identify any operability concerns in connection with configuration control of Hagan replacement modules.

Analysis

This finding is greater than minor because inadequate test controls could result in inadequate tests of equipment in the mitigating system cornerstone and thereby result in improper equipment operation. This could result in plant operation outside of analyzed conditions. Such operation could affect the availability, reliability, and capability of mitigating systems to respond to initiating events and prevent undesirable consequences. This finding is of very low safety significance because it is a test control deficiency that did not result in a loss of system function per Generic Letter 91-18.

Enforcement

10 CFR 50 Appendix B, Criterion XI, Test Controls, requires that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service be performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. The test procedures shall include provisions for assuring that all prerequisites for the given test have been met; that adequate test instruments are available and used; and the test is performed under suitable environmental conditions. Test results are required to be documented and evaluated to assure that test requirements have been satisfied. Contrary to the above, the inspectors identified that on or about August 2004, the licensee failed to implement adequate test control measures for testing to demonstrate that NUS safety-related multiplier/divider cards and peripheral amplifiers, were acceptable like-for-like replacement for Hagan modules. Additionally, the licensee failed to implement adequate test controls for modified summators with and without limiters, The licensee entered this issue into their corrective action program as 2004-10337-CR, for tracking the development of approved test procedures and completion of response time testing. Because the identified test control deficiency is of very low safety significance and the issue has been entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with Section VI.A of the NRC's Enforcement Policy: NCV 05000250, 251/2004011-01, Failure to Implement Adequate Test Controls.

(b) Inadequate Repair/Refurbishment Procedures for Hagan Modules

Finding

The inspectors identified an NCV of 10 CFR 50 Appendix B, Criterion V, Instructions, Procedures and Drawings, for the licensee failure to prescribe by documented instructions or procedures of a type appropriate to the circumstances, activities associated with refurbishment and/or repair of reactor protection system circuit components. Specifically, technicians were using uncontrolled, unreviewed, and unapproved checklists, as well as uncontrolled Excel spreadsheets, in order to affect repairs and refurbishment to Hagan modules associated with safety-related functions in the reactor protection system.

Description

The inspectors determined that uncontrolled, unreviewed, and unapproved checklists as well as uncontrolled Excel spreadsheets were used by I&C technicians to affect repairs and refurbishment to Hagan modules associated with safety-related functions in the reactor protection system. The inspectors reviewed an I&C unapproved work document, and determined that it consisted of a refurbishment list for summator (003-AD7-2), dated August 16, 1996; and a refurbishment list for a Manual Auto (M/A) station dated February 20, 2002. Both refurbishment lists provided detailed information concerning type, module description, module assembly, board assembly number, item number, description, and stock code. Written guidance was included for inspection/cleaning; part replacement; final inspection; labeling; and addition to the data base. Additionally, an attachment was provided which provided specific instructions for M/A stations, Isolators, Rod Speed Modules, Summators, Comparators, Controllers, and Lead Lag Controllers. The inspectors concluded that because the documents had not been formally reviewed and approved and controlled for use in the repair and refurbishment of Hagan modules, it did not satisfy the requirements delineated in 10 CFR 50 Appendix B, Criterion V, for documents used in activities which affects the quality of safety-related equipment.

Analysis

This finding is greater than minor because inadequate procedures to repair and refurbish Hagan modules could result in changes to the performance characteristics of equipment in the mitigating system cornerstone that are less conservative than the original equipment manufacturer's (OEMs) specifications. Such changes, for example response time, could result in plant operation outside of analyzed conditions and could affect the availability, reliability, and capability of mitigating systems to respond to initiating events and prevent undesirable consequences. This finding is of very low safety significance because it did not result in a loss of system function per Generic Letter 91-18.

Enforcement

10 CFR 50 Appendix B, Criterion V, Instructions, Procedures and Drawings, requires that all activities affecting quality shall be prescribed by documented instructions, procedures or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Criterion V requires that instructions, procedures or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Contrary to the above, on August 16, 1996, and on February 20, 2002, the licensee failed to ensure that procedures used by I&C Technicians for refurbishment of summators and M/A stations respectively, were reviewed, approved and controlled in accordance with the requirements of the 10 CFR 50 Appendix B, Criterion V. The licensee entered this issue into their corrective action program as 2004-10337-CR, for the evaluation, benchmark and drafting of more formal instructions for the conduct of the Hagan Repair Program. Because the identified I&C procedure deficiency is of very low safety significance (Green) and the issue has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC's Enforcement Policy: NCV 05000250, 251/2004011-02, Failure to Use Adequate I&C Procedures for Refurbishment of Westinghouse Hagan Modules.

(c) Inadequate Corrective Action

Finding

An NCV of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, was identified by the inspectors for the licensee's failure to take adequate corrective action to preclude the use of an inadequately evaluated alternate replacement capacitor.

Description

The inspectors noted one example in which interim corrective actions were not adequate to preclude the use of an unqualified alternate replacement part.

Condition Report CR 2004-5430 IEE Self-Assessment, identified that IEE-037258 inadequately evaluated an alternate replacement capacitor as a suitable replacement. The licensee had implemented two corrective actions after subsequently identifying that the capacitor was not a suitable replacement. The first corrective action was to delete the component from the 'Parts List' table located in the vendor's tech manual, V00224A. This change would take approximately 60 days to complete. The second corrective action taken was to add a 'maintenance note' to the parts procurement screen which basically stated that the component could be used in a like-for-like application or if an 'approved engineering document' justified its end use. The inspectors concluded that this last corrective action would not be effective because the vendor technical manual was an approved engineering document which listed the capacitor as a suitable replacement part. Because of this, the I&C technician could reasonably have obtained

that part from the materials warehouse, and used it in a safety-related application without being cognizant of the prohibition against its use.

Analysis

This finding is greater than minor because the licensee's actions to preclude the use of an unqualified capacitor in safety-related applications were not sufficient to prevent an I&C technician from requesting it from the stores. The part was listed as acceptable for use in the vendor technical manual, and was available from stores. The use of this unqualified capacitor in equipment in the mitigating system cornerstone could result in changes to equipment performance characteristics, and result in plant performance outside of analyzed conditions. Such operation could affect the availability, reliability, and capability of mitigating systems to respond to initiating events and prevent undesirable consequences. This finding is of very low safety significance because it did not result in a loss of system function per Generic Letter 91-18.

Enforcement

10 CFR 50 Appendix B, Criterion XVI states that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective actions taken to preclude repetition. Contrary to the above on May 1, 1995, IEE-037258 inadequately evaluated an alternate replacement capacitor as a suitable replacement and the licensee failed to implement adequate corrective actions which ensured that this unqualified alternate replacement capacitor would not be used during refurbishment of Hagan modules. This issue was entered into the licensee's corrective action program as 2004-10324-CR, to revise the Instock Disposition Status of Passport Evaluation 080201, Stock Code 0003546-2, to ensure that the capacitor cannot be used for Hagan modules. Because the identified inadequate corrective action is of very low safety significance (Green) and the issue has been entered into the licensee's corrective action program, this violation is being treated as a non-cited violation (NCV), consistent with Section VI.A of the NRC's Enforcement Policy: NCV 05000250, 251/2004011-03, Failure to Establish Adequate Interim Corrective Action to Preclude Use of Unqualified Capacitor.

d. Assessment of Safety Conscious Work Environment

(1) Inspection Scope

The inspectors interviewed the licensee's site engineering personnel in order to ascertain the safety conscious work environment of their engineering staff at Turkey Point, and to determine the extent of understanding of the revised corrective action program and how it should be implemented. Interviews were also conducted with I&C technicians to determine the conditions under which refurbishment of Westinghouse

Hagan modules are accomplished on site. Additionally, the inspectors reviewed FPL Nuclear Division QA Audit Report, QAO-PTN-00-007, August 2, 2000 to September 21, 2000.

(2) Assessment

The inspectors concluded that the licensee's corrective action program emphasized the need for all employees to identify and report non-conforming conditions as required by plant procedure NAP-204, Corrective Action. The inspectors also concluded that the licensee's corrective action program adequately implements the recommendations of Generic Letter 91-18, concerning the identification and disposition of degraded and/or non-conforming conditions. At the time of the inspection, Engineering Quality instruction ENG-QI-2.5, Condition Report, used by engineering personnel to implement the requirements of the corrective action program was being revised to be consistent with the program controls delineated in procedure NAP-204. Discussions with engineering personnel of how NAP-204, Condition Reporting, Revision 1, should be used along with their site level quality instruction ENG-QI-2.5, revealed differences among the engineering staff's understanding of how the new program will be implemented. Because of the ongoing changes to the corrective action program, the inspectors concluded that additional training of the engineering staff on use of the revised program controls as it relates to the disposition of CRs may be required. Based on review of the audit report, the inspectors concluded that the licensee's QA audits were effective in identifying problems in that the audit report documented that CR supplements were being inappropriately used to make changes to safety-related components.

The inspectors formally and informally interviewed other licensee personnel to develop a general view of the safety-conscious work environment, and to determine if any conditions existed that would cause workers to be reluctant to raise safety concerns. The inspectors also discussed issues with the Senior Resident Inspector to gain her perspective on the site safety-conscious work environment. On the basis of interviews conducted throughout the inspection, the inspectors concluded that station personnel felt free to input safety findings into the CAP.

4OA6 Meetings Including Exits

The inspectors presented the inspection results to Mr. Terry Jones, Site Vice President, and other members of the licensee's management at the conclusion of the inspection on October 7, 2004. The licensee acknowledged the findings presented.

Westinghouse Class 2 and 2C proprietary information was examined during the inspection but is not contained in this report.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG 1600, for being dispositioned as an NCV.

. 10 CFR 50 Appendix B, Criterion III, requires that design changes, including field changes shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization. Contrary to this on March 25, 1997, Condition Report, CR 97-590 made an unauthorized design change to Controller PC-3-444D by removing and installing jumpers which converted the controller from a proportional, integral, derivative controller to a purely proportional controller. Additionally, on February 17, 1997, CR 96-1590 made an unauthorized design change to the temperature average control system power mismatch loop lead lag controller PM-4-446 by installing a new lag value

This finding is of very low safety significance because the design changes did not involve any safety-related modules and did not impair the ability of the Hagan system to perform their design safety functions or challenge operability of RPS and ESFAS. The licensee attributes the apparent cause of this violation to be an inadequate engineering quality instruction which was revised several years ago to correct this problem. Condition Report 2004-5067-CR was written on August 25, 2004, for additional revision to ENG-QI 2.5, Condition Reports, Revision 17, to ensure consistency with the revised corrective action program, and to include recurrence control which precludes making design changes during disposition of CRs.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

T. Jones, Vice President-Site Operations
M. Pearce, Plant General Manager
G. Warringer, Site Quality Manager
W. Parker, Licensing Manager
S. Chaviano, Design Engineering Manager
J. Granger, Chief Electrical Engineer-Juno Beach
T. Sweeny, Engineering Supervisor, Electrical and I&C
R. Cuthbertson, Procurement Engineering
T. Koschmeder, Maintenance Supervisor, I&C.
K. O'Hare, Radiation Protection/Safety Manager
R. Earl, Performance Improvement/Corrective Actions Group Supervisor

NRC

K. Weaver, Senior Resident Inspector
M. Pribish, Visiting Resident Inspector
L. Cain, Resident Inspector VC Summer
C. Smith. Senior Reactor Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000250, 251/2004011-01	NCV	Failure to Implement Adequate Test Controls (Section 4OA2.c.(2)(a))
05000250, 251/2004011-02	NCV	Failure to Use Adequate I&C Procedures for Refurbishment of Westinghouse Hagan Modules, (Section 4OA2.c.(2)(b))
05000250, 251/2004011-03	NCV	Failure to Establish Adequate Interim Corrective Action to Preclude Use of Unqualified Capacitor (Section 4OA2.c.(2)(c)).

LIST OF DOCUMENTS REVIEWED

Condition Reports

CR No.	Description/Title
2004-8224	Update to VTM V00224A
04-8172	Proposed PC/M No. 00-006 Changes
04-7947	Comparator Component Value Discrepancies
04-7824	High Comparator Failure Rate
04-7061	The Nuclear Engineering Quality Instruction for Condition Reports, ENG-QI-2.5, had not been updated to reflect the SITRIS process and NAP-204.
04-7161	QA Audit of HAGAN Repair/Refurbishment Process
04-5637	Tech. Manual V00224A Capacitor C4 Value Discrepancies
04-5560	Repairs of HAGAN Modules
04-5430	IEE Self Assessment
04-5414	Errors discovered in Vendor Tech. Manual V00224A
04-5067	Configuration Control of HAGAN Modules
04-2591	4A FCV-4-478 Failed
04-1178	Spurious Alarms for 3C Stm/FF Mismatch
04-1152	FCV-3-498 Failed
03-3989	FCV-3-498 Tripped to Manual
03-3682	FCV-4-114A Responding Abnormally
03-3642	LC–4-459F Would not go into Auto
03-3554	3B Stm/FF Mismatch Spurious Alarms
03-1208	PC-4-446A Spurious Operation

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02-2355	PC-3-486 Failed to Trip
02-0105	LT-3-494 Signal Decreasing
01-2369	Spurious Alarm caused by TM-408
01-2256	Incorrect Panel Meters for MA Stations
01-0525	Panel Meter for FW MA Station Reading High
01-0926	Discrepancy between Field Wiring and Drawings
01-0298	Two Comparators Found Defective in Stores
01-0259	PC-3-494 Failed to Trip
00-2265	LQ-4-112 & LQ-4-115 Ground wire Missing
00-1110	TM-3-408G Signal Spiking
00-1060	PZR LVL Instability after calibrating SC-3-151/151A
00-0039	PM-3-464B Found OOC
00-0001	Optimatic Computer OOC
99-0058	4C STM/FF Mismatch Spurious Alarms
98-1839	Controller Calibration Procedure Problems
98-1768	LC-3-476 Found OOC
98-1351	TM-3-409D OOT
98-1282	PC-4-476 Failed to Trip
98-0330	FC-3-498A Failed to Trip
98-0268	LC-3-484B Found OOT
98-0101	LC-3-475 Failed during Surveillance
98-0100	FC-3-495 Failed to Reset
97-0814	PC-4-455C Found OOT

97-0774	LC-102A,B,C and LC-108A Removed
97-0811	Loop Pwr. Supply Voltage Tolerance Evaluated
97-0689	Capacitor C28 added to Summator
97-0590	Converting Controller by installing Jumpers
97-0502	Controller Oscillations
97-0501	Replace 2K resistor with 5K resistor
97-0348	Replaced fixed resistor with 2K Potentiometer
97-0230	External Wiring Discrepancies in P-3/4-444
96-1636	LC-4-476A Found Low OOT
96-1590	PM-4-446 Lag Value Changed to 1 Second
96-1408	PM-3-464B Found OOT
96-1017	LC-3-494B Failed to Trip
96-0805	Found Missing Screw
96-0714	LC-3-496A Failed to Trip
96-0664	RCP Seal Leakoff Drawing Discrepancies
96-0347	F-4-485 Test Jack Wired Backwards
95-0054	S/G 3C Level Drifted Low
95-0051	S/G 3C Level Drifted Low
95-0050	S/G 3C Level Drifted Low
95-0004	S/G Level Controller wire landed incorrectly
94-0732	High Comparator Failure Rate
94-0034	741 Op Amps
92-0234	NPRDS Failure Data

LER 2004-002-00	Auto Reactor Trip Due to Low S/G Lvl and STM/FF Mismatch

Procedures/Other Documents

Operability Assessment of Reconfigured Hagan Modules-Revision 1

QRNO: 04-0069	PTN Nuclear Assurance Quality Report HAGAN Refurb
QAO-PTN-00-007	FPL Nuclear Division QA Audit Report, " Corrective Action Program Functional Area Audit", August 2, 2000 to September 21, 2000.
Item Equiv. Eval. (IEE)-080201	Capacitor, Metallized Polyester, .33 MFD
IEE-037258	Capacitor, Metallized Polyester, .33 MFD
NAP-400	Nuclear Administrative Procedure, 'Condition Reports' Revision 1
NAP-204	Nuclear Administrative Procedure, 'Condition Reporting' Revision 1
CMP-T-04-006	Change Management Plan, ' Implementation of Electronic Condition Reporting' Revision 0
WNA-AR-00005-FPL	Westinghouse Report, "Evaluation of Changes to Safety-related 7100 System Modules," for FP&L Turkey Point Units 3 & 4, Revision 0
WCAP-14036-P-A,	Elimination of Periodic Protection Channel Response Time Tests, Revision 1
5610-049-DB-001	Turkey Point Units 3 and 4, Reactor Protection System Design Basis Document, Section 7.11, Time Response
ANSI/ISA S67.06-1984	Response Time Testing of Nuclear Safety-related Instrument Channels in Nuclear Power Plants, Approved August 29, 1986.
QI-1.0	Quality Instruction Nuclear Engineering 'Design Control', Revision 19
QI-1.1	Quality Instruction Nuclear Engineering 'Engineering Package, (EP), Revision 14

QI-1.2	Quality Instruction Nuclear Engineering 'Minor Engineering Package, (MEP), Revision 14
QI-1.3	Quality Instruction Nuclear Engineering 'Drawing Change Requests (DCRs), Revision 6
QI-1.4	Quality Instruction Nuclear Engineering 'Change Request Notices(CRNs), Revision 7
QI-1.8	Quality Instruction Nuclear Engineering 'Design/Operability Reference Guide, Revision 9
QI-1.14	Quality Instruction Nuclear Engineering 'Maintenance Support Package, Revision 1
QI-2.1	Quality Instruction Nuclear Engineering '10 CFR 50.59 Applicability /Screening/Evaluation, Revision 6
QI-2.3	Quality Instruction Nuclear Engineering 'Operability Determinations', Revision 6
QI-2.5	Quality Instruction Nuclear Engineering 'Condition Reports', Revision 17
QI-4.2	Quality Instruction Nuclear Engineering 'Procurement Engineering Control, Revision 13
PC/M No. 00006	Hagan Enhancements, Revision 00

LIST OF ACRONYMS

CR	Condition Report
CAP	Corrective Action Program
ESFAS	Engineered Safety Feature Actuation System
IEE	Item Equivalency Evaluation
I&C	Instrumentation and Control
NCV	Non-cited Violation
PC/M	Plant Change Modification
RPS	Reactor Protection System
SITRIS	Station Issue Tracking and Information System
TQAR	Topical Quality Assurance Report

CONDITION REPORTS WRITTEN DURING THIS INSPECTION

2004-10337-CR	Time Response Testing for Hagan Modules
2004-10084-CR	Hagan Repair Program Audit Concern
2004-10324-CR	Revise the Instock Disposition Status of Passport Evaluation 080201, Stock Code0003546-2, so that the Capacitor cannot be issued for use in Hagan Modules.

INSPECTION PLAN

INSPECTION PLAN
TURKEY POINT NUCLEAR PLANT
IDENTIFICATION AND RESOLUTION OF PROBLEMS INSPECTION

1. Background and Purpose

This inspection will evaluate the capability of the Westinghouse Hagan modules to perform safety functions required by its design basis; adherence to the design and licensing basis; and consistency of the as-built configuration with the plant current licensing bases. The primary objective of this inspection is to assess the effectiveness of design changes made to Westinghouse Hagan modules through an in-depth review of calculations, analyses, and other engineering documents prepared in connection with the implemented design changes. A secondary objective of the assessment is to determine the quality of the safety evaluations and operability evaluations performed by the licensee in support of modifications made to the Westinghouse Hagan modules.

2. Inspection Requirements and Guidance

The guidance delineated in Inspection Procedure 71152, Identification and Resolution of Problems, will be used during this inspection. Additionally, the licensee's resolution of degraded and non-conforming conditions will be evaluated using the guidance of Generic Letter 91-18, Revision 1, dated October 8, 1997.

3. PLANNED ACTIVITIES

3.a Walkdown Activities

- Conduct a walkdown of the Westinghouse Hagan modules and familiarize the team with the general plant and the specific instrumentation system hardware layout.

3.b Engineering Safety Focus

Verify the adequacy of the design control process used to ensure that configuration control is maintained for the Westinghouse Hagan modules by performing the following:

- Review the design, licensing bases, and other design documents such as calculations and analyses, for the Westinghouse Hagan modules and determine the functional requirements for the system and each active component during accident or abnormal conditions.

- Review the licensee's engineering evaluations of degraded or non-conforming conditions of Westinghouse Hagan modules subject to 10 CFR 50 Appendix B, and verify that prompt corrective actions to correct or resolve the condition has

been taken. The timeliness of the corrective action should be commensurate with the safety significance of the issue.

Review design changes implemented to resolve degraded or non-conforming conditions of Westinghouse Hagan modules that are subject to 10 CFR 50 Appendix B and 10 CFR 50.59 and verify the adequacy of the safety evaluations.

- Review recent operability determinations and verify if they were performed in accordance with procedures and if conservative decisions were made. For Westinghouse Hagan modules that were not expressly subject to the TS and were determined to be in a degraded and/or non-conforming condition, verify that a " Reasonable Assurance of Safety" has been demonstrated by the licensee.

- Verify that the licensee's process for :

  (1) Resolution of Degraded and non-conforming Conditions
  (2) Operable/Operability : Ensuring the Functional Capability of a System or Component are consistent with the technical guidance of Generic Letter 91-18.

- Review the organization, staffing , and training for Site Engineering. Determine if responsibilities and management expectations are clearly defined and implemented for the external communication interface with the OEM concerning problems involving Westinghouse Hagan modules.

3.c Problem Identification/Problem Resolution

Identify and evaluate the scope and extent of the degraded and/or non-conforming conditions involving Westinghouse Hagan modules by performing the following:

- Review site level procedures which describes the corrective action program to determine if requirements have been established for controlling non-conforming materials, parts, or components.

- Verify that requirements have been established for the disposition of nonconforming items to include accept-as-is, repair, rework, scrap, or return to the vendor.

- Review system/component engineering documentation to see how non-conforming conditions involving Westinghouse Hagan modules are identified, tracked, and resolved. Discuss the status of the System Health Report with the responsible system engineer.

- Verify that degraded and/or non-conforming conditions involving Westinghouse Hagan modules dispositioned as "accept-as-is or repair" shall receive a Technical Justification from the Site Engineering organization.

- Verify that the Westinghouse Hagan modules dispositioned as reworked, repaired, or replaced shall satisfy the technical and quality requirements of the original modules inspection and tests.

- Review FP&L documentation concerning Hagan module failure history for PTN and the industry. Evaluate the licensee's extent of condition determination, root cause analysis, and implemented corrective actions for Hagan modules .

- Final disposition of CRs 2004-5067, 5560, and 5637; review the status of CRs and the corrective actions described for resolution of degraded non-conforming Hagan modules.

- Verify that the licensee is following the guidance of Generic letter 91-18 for the disposition of degraded and /or non-conforming Westinghouse Hagan modules.

3.d Technical Adequacy of Implemented Corrective Actions

Verify the technical adequacy of corrective actions implemented for Westinghouse Hagan modules having degraded and / or non-conforming conditions by performing the following:

- Review completed engineering output documents such as plant modifications, 10 CFR 50.59 Safety Evaluations, Calculations and Operability Determinations to verify the accuracy and quality of the engineering work.

- Review implementation of the design controls for design Verification performed for approved design output documents. Verify that the results of design verifications are documented with the identity of the verifier indicated. Additionally, verify that documentation of the results are clearly auditable against the verification method used.

  Review and evaluate FP&L changes to summator, comparator, isolator, and power supply modules with respect to module function and critical characteristics including response time.

  Review the plant procedure used for Hagan module response time testing and evaluate the technical adequacy of the test acceptance criteria specified for evaluating response.

- Verify that post modification tests requirements specified for the modified Westinghouse Hagan modules demonstrated operability of the instrument loop by satisfying the following:

- Modified Westinghouse Hagan module response time was sufficient to serve accident /event functional requirements assumed by design analyses.

- Any Westinghouse Hagan module response time change was bounded by accident analyses and loading of SSC on the electrical support systems.

- Modified Westinghouse Hagan modules will not cause unintended system interactions to occur.

- The aggregate impact on safety-related loops having modified Westinghouse Hagan modules did not impair the accuracy of the loop to satisfy the plants licensing and design bases requirements.

- Instrumentation and control signals will be appropriate under accident/event conditions.

- Failure modes introduced by modified Westinghouse Hagan modules are bounded by existing analyses.

Review FP&L Work order issued to capture details of module response time testing. Review and evaluate the technical adequacy of the test results of tests completed for the (1) summator module with 10 and 39 micro-farad capacitor and (2) the original square root module and NUS replacement module.

4. Team Assignments

Caswell Smith, Lead Inspector

Section 3.b, Engineering Safety Focus
Section 3.d Technical Adequacy of Implemented Corrective Actions

Loyd Cain, RI, V. C. Summer

Section 3.c, Problem Identification and Resolution

Attachment