September 28, 2005

Mr. Theodore Sullivan
Site Vice President
Entergy Nuclear Northeast
James A. FitzPatrick Nuclear Power Plant
Post Office Box 110
Lycoming, NY 13093

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - NRC SAFETY SYSTEM DESIGN AND PERFORMANCE CAPABILITY INSPECTION REPORT 05000333/2005008

Dear Mr. Sullivan:

On August 19, 2005, the U.S. Nuclear Regulatory Commission (NRC) completed a Safety System Design and Performance Capability team inspection at your James A. FitzPatrick Nuclear Power Plant. The enclosed inspection report documents the inspection results which were discussed on August 19, 2005, with Mr. Kevin Mulligan and other members of your staff.

The inspection examined activities conducted under your license related to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspection involved field walkdowns, examination of selected procedures, calculations and records, and interviews with station personnel.

Based on the results of the inspection, no findings of significance were identified.

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

Sincerely,

/RA/

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50-333
License No. DPR-59

Enclosure: Inspection Report No. 05000333/2005008
w/Attachment: Supplemental Information

cc w/encl:
G. Taylor, CEO, Entergy Operations
M. Kansler, President, Entergy
J. Herron, Sr, VP and Chief Operating Officer
C. Schwarz, VP, Operations Support
K. Mulligan, General Manager, Plant Operations
O. Limpias, VP, Engineering
J. McCann, Director, Licensing
C. Faison, Manager, Licensing
M. Colomb, Director of Oversight
D. Wallace, Director, Nuclear Safety Assurance
R. Plasse, Acting Manager, Regulatory Compliance
T. McCullough, Assistant General Counsel
P. Smith, President, New York State Energy Research and Development Authority
P. Eddy, New York State Department of Public Service
S. Lyman, Oswego County Administrator
Supervisor, Town of Scriba
C. Donaldson, Esquire, Assistant Attorney General, New York Department of Law
J. Sniezek, PWR SRC Consultant
M. Lyster, PWR SRC Consultant
S. Lousteau, Treasury Department
INPO

Distribution:
S. Collins, RA
M. Dapas, DRA
B. McDermott, DRP
D. Jackson, DRP
S. Lee, RI OEDO
R. Laufer, NRR
J. Boska, PM NRR
P. Tam, PM (backup)
P. Milano, PM (backup)
L. Cline, DRP - NRC Senior Resident Inspector
D. Dempsey, DRP, Resident Inspector
K. Kolek, Resident OA
Region I Docket Room (with concurrences)
ROPreports@nrc.gov
A. Blough, DRS
M. Gamberoni, DRS
L. Doerflein, DRS
F. Arner, DRS

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DATE	09/29/05		09/29/05		09/29/05			

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.	50-333
License No.	DPR-59
Report No.	05000333/2005008
Licensee:	Entergy Nuclear Northeast (Entergy)
Facility:	James A. FitzPatrick Nuclear Power Plant
Location:	268 Lake Road Scriba, New York 13093
Dates:	August 1-5 and August 15-19, 2005
Inspectors:	Frank Arner, Senior Reactor Inspector, Division of Reactor Safety (DRS) (Team Lead) Joseph Schoppy, Senior Reactor Inspector, DRS Paul Kaufman, Senior Reactor Inspector, DRS Jon Lilliendahl, Reactor Inspector, DRS James Krafty, Reactor Inspector, DRS Douglas Tifft, Reactor Inspector (Trainee) George Skinner, Electrical Contractor
Approved by:	Lawrence T. Doerflein, Chief Engineering Branch 2 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000333/2005008; August 1-5 and August 15-19, 2005; James A. FitzPatrick Nuclear Power Plant; Engineering Team Inspection.

The inspection was conducted by five regional inspectors and an NRC contractor. No findings of significance were identified during the inspection. 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

None.

B. Licensee-Identified Violations

None.

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Safety System Design and Performance Capability (IP 71111.21)

a. Inspection Scope

The reactor core isolation cooling (RCIC) system and portions of the residual heat removal (RHR) system were selected for inspection based on a review of the FitzPatrick Individual Plant Examination (IPE) report and a review of previous engineering inspections performed by the NRC at FitzPatrick. The team prioritized components with a higher risk achievement worth (i.e., failure of the component would have a larger impact on the probability of core damage) for review. Additionally, the team identified important support systems for detailed review in order to ensure the RCIC and RHR systems were capable of performing their design functions. With respect to the RHR system, the selected portions of the system reviewed were those associated with the containment heat removal and low pressure coolant injection (LPCI) modes of operation.

The team reviewed specific design details and supporting analyses for the low pressure coolant injection and suppression pool cooling modes of operation. Additionally, the containment spray mode of RHR operation was reviewed to ensure design assumptions and analyses were consistent with actual system capability. The team reviewed system interactions among these modes, including the automatic realignment to the LPCI lineup upon receipt of an accident signal. Various equipment and instrumentation associated with the system were reviewed to ensure the actual equipment installed in the field was consistent with design assumptions utilized in various calculations of record. This included suction strainers, pump discharge orifices, and instrumentation and control components. The RHR pumps and motors were selected for a detailed review in order to identify any generic issue which may be applicable to all the pumps and motors. Additionally, the pump minimum flow valves and injection valves were selected for detailed reviews with respect to their capabilities to operate under the worst case assumed degraded voltages and differential pressures. RHR component performance was evaluated with respect to design requirements for normal plant operations such as the capability of suppression pool cooling, and emergency system performance such as that assumed in the Large Break Loss of Coolant Accident.

The team reviewed operations and surveillance test procedures, and the licensed operator training lesson plans to evaluate the consistency between design assumptions and the expected system performance based on actual testing. The team conducted plant walkdowns to check specific RHR system field configuration and lineup details with respect to approved design drawings, system modifications, and engineering changes. The walkdown of the system was performed to assess the material condition of the components and confirm the existence of adequate controls over nonconforming material and any potential hazards such as seismic considerations. This was performed to ensure that the existing configuration could not compromise the design function of the safety-related system components.

The team reviewed the latest surveillance test procedure results, including inservice testing (IST), for the RHR system. A review of the existing licensing bases assumptions with respect to net positive suction head requirements for the RHR pumps was performed to ensure that they were conservative with respect to actual performance capabilities of the system. System frictional losses assumed in the calculations of record were reviewed along with containment overpressure assumptions to ensure consistency with the approved licensing bases and the performance assumed in the Updated Final Safety Analysis Report (UFSAR).

The team also included a review of completed corrective and preventive maintenance packages and post-maintenance tests, to determine operational readiness and configuration control. The team observed portions of the ‘A’ RHR quarterly in-service test on August 2, 2005. The team reviewed the actual performance of the system with respect to the procedural requirements. These procedural requirements were then checked to ensure that they were conservative with respect to ensuring that the system could produce the minimum flowrates assumed for various transients and accidents assumed. The inspectors interviewed various plant personnel responsible for system status, licensing basis controls, and the implementation of modifications to verify the adequacy of the existing design.

The team selected the RCIC pump and turbine for a detailed review. Additionally, the motor operated injection valve was selected for a detailed review. This valve was selected because RCIC flowrate testing is normally performed through a test return valve back to the suction source or condensate storage tank. The injection valve on an actual initiation event, receives an opening signal such that RCIC flow would be delivered to the vessel for events such as loss of feedwater. The team reviewed the calculations of record and design analysis with respect to the capability of this valve to operate under the most challenging conditions such as high differential pressure. This review was performed to verify appropriate sizing of the motor operator and proper torque switch settings. Additionally, Entergy’s analyses with respect to pressure locking and thermal binding considerations were reviewed.

The team performed detailed reviews of the calibration procedures for the turbine control system as well as completed preventive maintenance tasks and frequencies. The review was performed to evaluate the acceptability of the frequency of these tasks in consideration of available operating experience such as service information letters and information notices. The team reviewed oil analyses results for the turbine lube oil system to determine if there were any notable trends which could be indicative of bearing degradation or equipment degradation. Data was reviewed against developed acceptance criteria in procedures. This criteria in turn was reviewed against standard vendor recommendations to evaluate the effectiveness of these procedures.

The latest RCIC pump performance data was reviewed in detail to ensure that the current performance of the pump was consistent with the assumptions utilized in the plant risk models relative to expected RCIC flowrates for transients such as loss of feedwater and loss-of-offsite power. Additionally, the team reviewed the test results to ensure that the turbine/pump performance would be capable of injecting at the rated flowrate against the highest assumed backpressures taken from the main steam safety relief valve settings. This was done to ensure that on a loss-of-offsite power, which results in the main steam isolation valves closing, that the system would remain capable of injecting enough flow to makeup for decay heat. The team reviewed available data from actual 2003 and 1999 injection events to evaluate actual pump performance against the assumed capability in the analyses of record.

The team reviewed the bases for the steam leak detection devices located in the RCIC room. This review was performed to verify that an inadvertent isolation of the system would not take place during events such as a station blackout. The team reviewed the instrumentation isolation setpoints, along with several calculations which had been performed to determine the worst case temperatures assumed to exist in the RCIC room during this event. The team also reviewed the station blackout procedure to verify that operator actions assumed with respect to the RCIC system were appropriate given the expected timeframes for completing the actions. The team reviewed the expected temperature response along with the assumed equipment performances to ensure the system would remain functional during events where AC powered ventilation equipment would be lost.

The team reviewed actual system data from surveillance tests to evaluate the RCIC turbine control system performance. This review was performed to identify if any abnormalities existed with the performance of the turbine control system. Applicable acceptance criteria within the RCIC pump surveillance tests were reviewed to ensure that the criteria were consistent with assumed system operation in the plant risk model. The control system hydraulic design was reviewed to ensure that the control oil had appropriate temperature alarms and cooling design such that operation would continue under the most adverse temperature conditions. The availability of the condensate storage tank (CST) was reviewed in detail, since this is a supply of relatively cool water which is important since the system cools the lube oil from process fluid. The design of the CST was reviewed from the standpoint of the automatic swap to the suppression pool on low level, the existing design relative to assumed events such as a tornado, and heat tracing such that the low level instrumentation is protected and remains functional during cold weather conditions. The automatic swapover was reviewed to ensure that NPSH considerations remained conservative and that potential vortexing conditions would not degrade the pump.

The team reviewed the capability of selected electrical systems to support the design function of the RCIC and RHR systems. The team performed walkdowns of transformers, switchgear, motor control centers, field cabling, raceways, components, and instruments. During the walkdowns, the team assessed: (1) the placement of protective barriers and systems; (2) the physical separation of trains and the provision for seismic concerns; (3) accessability and lighting for any required local operator actions; (4) the material condition of the associated electrical components; (5) the conformance of the currently installed system configurations to the design and licensing bases; and, (6) the physical separation of the onsite and offsite electrical power sources.

The team reviewed the current as-built instrument and control, and electrical design of the RCIC and RHR systems and required support systems. These reviews included an examination of design basis documents, voltage calculations, protective relaying schemes, control logic, setpoint accuracy calculations, instrument loop diagrams, operating procedures, surveillance procedures, and surveillance test reports. Specifically, the team reviewed the test results of the battery quarterly, service, and performance tests to ensure that operability status was demonstrated. This review was performed to determine if the calculated voltages and capacity of the batteries was appropriately translated into the test procedures.

The team performed detailed reviews of selected calculations. These reviews included the analysis for the CST low level instruments, and the actuation logic for the turbine driven RCIC pump to verify that it would start automatically upon receipt of a reactor low-low level signal. The team also reviewed control logic for the RCIC system motor-operated suction valves to verify that pump suction would automatically swap to the suppression pool on a CST low level signal. The team reviewed voltage calculations for RHR pump motors and LPCI and RCIC MOVs and their associated control circuits. The review of degraded voltage schemes included the basis for the 4 KV degraded voltage relay setting with respect to assurance that loads downstream would have adequate voltage to function under degraded voltage conditions. Additionally, the team reviewed the loading and voltage drop calculations of the 125 VDC station battery and the 419 VDC LPCI batteries to verify that all direct current loads were accounted for and that adequate voltages could be provided for the RCIC and LPCI systems following a postulated design basis accident. For the station blackout scenario, the voltage available to the Electronic Governor Module for the RCIC turbine control was verified to ensure that the battery would be capable of maintaining operation of the RCIC turbine.

In addition to the mechanical and electrical design reviews, the team reviewed the capability of the operators to perform selected emergency operating procedural directed actions, given the postulated environmental conditions and available time assumed for events or accidents requiring RCIC and RHR system response. A simulator walkdown was performed with respect to specific plant controls, particularly where field modifications had been implemented. Finally, a sample of operating experience relative to both the RCIC and RHR system was selected in order to review the adequacy of the licensee’s review with respect to the issues. This review included industry related licensee event reports, Service Information Letters, and NRC operating experience such as generic letters and information notices.

For both systems, the team reviewed selected mechanical calculations and analyses to verify appropriate design input assumptions were used and that the assumptions applied to the current system and plant configuration. The team verified that adequate engineering methods were utilized and the technical bases supported the conclusions. The team evaluated system environmental conditions, including the effect of various design basis accidents, to verify plant conditions were bounded by the equipment qualification assumptions.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed Entergy's effectiveness in identifying and resolving problems associated with the RCIC and RHR systems. The inspectors reviewed condition reports (CRs), Licensee Event Reports (LERs), self-assessments, and work orders to assess plant performance and corrective actions. This review was to verify that identified issues were appropriately entered into the corrective action program and resolved in a timely manner. Documents reviewed are listed in Attachment 1, Supplemental Information.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

The team presented the inspection results on August 19, 2005, to Mr. Kevin Mulligan and other members of Entergy's staff. The team verified that proprietary information is not included in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

J. Abisamra, Supervisor, Design Engineering
S. Bono, Director, Engineering
M. Durr, Manager, System Engineering
T. Edwards, Senior System Engineer
S. Glover, Design Engineer
D. Johnson, Manager, Operations
M. Kayhan, Senior System Engineer
K. Mulligan, General Manager, Plant Operations
D. Ruddy, Supervisor, Design Engineering

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None.

LIST OF DOCUMENTS REVIEWED

Audits and Self-Assessments

Component Performance Monitoring Snapshot Self-Assessment (LO-JAFLO- 2005-00035), dated 6/15/05
SR No. QS-2005-JAF-001, Review of QA Findings in the Engineering Functional Area, dated 1/6/05
QA-4-2004-JAF-1, Design Control (LO-JAF- 2004-00005), dated 2/27/05

Calculations and Design Documents

E-76, Load Duty Cycles for LPCI MOV Power Supplies, Rev. 0A
JAF-89-045 Station Blackout Coping Analysis, Rev. 1
JAF-CALC-ELEC-00562, 419V DC LPCI Battery Design Duty Cycle, Rev. 0A
JAF-CALC-ELEC-01857, 419V DC LPCI Power Supply Sizing, Rev. 0
JAF-CALC-ELEC-01860, LPCI Battery Performance Test End Voltage Cutoff, Rev. 1
JAF-CALC-ELEC-02609, 125VDC "A" Station Battery Sizing and Voltage Drop, Rev. 2
JAF-CALC-ELEC-04343, Calculations for the JAF Plant Going From Full Load to a Trip With Estimated LOCA and with Operator Action, Rev. 0
JAF-CALC-ELEC-01488, 4KV Emergency Bus Loss of Voltage, Degraded Voltage and Time Delay Relay Uncertainty and Setpoint Calculation, Rev. 4

JAF-CALC-ELEC-00-001117, Perform 600 volt MCC Control Circuit Voltage Drop Calculation to Verify the Minimum Pickup Voltage for Selected Contactor Circuits, Draft
JAF-CALC-RCIC-02326, RCIC Enclosure Heat Up Calculation, Rev. 0
JAF-CALC-RCIC-00729; 13LS-76A, 13LS-76B and 13LS-77B Condensate Storage Tank (CST) Low Level Switches Setpoint Calculation, Rev. 2
CALC No. 12966-B-31-1, RCIC Enclosure Ventilation, Rev. 0
AF-CALC-RCIC-03321, RCIC Air Entrainment, Rev. 0
JAF-CALC-RCIC-00729, 13LS-76A, 13LS-76B, 13LS-77A and 13LS-77B Condensate Storage Tank (CST) Low Level Switches Setpoint Calculation, Rev. 2
JAF-CALC-RCIC-02061, Thrust and Torque Limits Calculation for 13MOV-15, Rev. 2
JAF-CALC-RCIC-02050, Thrust and Torque Limits Calculation for 10MOV-16B, Rev. 2
JAF-CALC-MISC-02634, Station Blackout Torus Heat-up for Power Uprate Conditions, Rev. 0
CALC No. 89-JAF-01, Room Heatup Analysis, dated 4/15/89
CALC No. 98-019, ECCS & RCIC Pump Suppression Pool NPSH, Rev. D
JAF-CALC-RHR-01701, Thrust and Torque Limits Calc. For 10 MOV-26A, Rev. 8
JAF-CALC-RHR-01702, Thrust and Torque Limits Calc. For 10MOV-26B, Rev. 6
JAF-CALC-RHR-02050, Thrust and Torque Limits Calc. For 10MOV-16B, Rev. 1
JAF-CALC-RHR-02945, Tube minimum Required Wall Thickness of RHR Heat Exchangers, Rev. 1
JAF-CALC-RHR-02953, RHR Heat Exchanger K-value with Reduced Tube Side Fouling Factor, Rev. 0
JAF-CALC-RHR-00633, Test Measurement Uncertainty for RHR Pump Technical Specification Differential Pressure, Rev. 0B
JAF-CALC-RHR-00407, RHR Pump Discharge Orifice Sizing, Rev. 0
JAF-CALC-RHR-01080, RHR Min. Flow LPCI Flow Diversion, Rev. 0
JAF-CALC-RHR-01861, RHR Pump Flow with 10MOV-16A or 10MOV-16B Failed Open, Rev. 0
JAF-CALC-RHR-01818, Reduced Voltage Analysis for 10MOV-16A & 10MOV-16B, Rev. 0
JAF-CALC-RHR-01821, Reduced Voltage Analysis for 13MOV-15, Rev. 0
14620-E-72-01, Voltage Profile fed from Reserve Station Service Transformer, dated 10/15/86
14620-E-72-2, 600V Class 1E Cable Size Review, Rev. 2
E-77, Voltage Profile – Emergency Buses Fed From Reserve Station Service Transformers, dated 10/27/76
E-81, Under Voltage Study of Class 1E Equipments MCC Control Ckts., dated 6/25/77
12966-E-81-1, Safety Load Terminal Voltage Calculations, Rev. 0
14620-E-9016-1, 4,160V Bus Voltages During a Live Bus Transfer of Buses From the Reserve Station Service Transformer (RSST) to the Normal Station Service Transformer (NSST) with RSST Tap at 116, Rev. 0A
14620-E-9016-2, Second Level (Degraded Grid) Undervoltage Relay Set Point Determination for Emergency Buses, Rev. 0
14620-E-9016-2, Second Level (Degraded Grid) Undervoltage Relay Set Point Determination for Emergency Buses, Addendum 0A
14620-E-9016-2, Second Level (Degraded Grid) Undervoltage Relay Set Point Determination for Emergency Buses, Minor Revision 1
DBD-071 Tab I, Design Basis Document for the Electrical Distribution System 4160V and 600V Power Systems, Rev. 6
DBD-071 Tab II, Design Basis Document for the Electrical Distribution System 120V Power Systems, Rev. 2

DBD-071 Tab III, Design Basis Document for the Electrical Distribution System 125V and 24V DC Power Systems, Rev. 3
DBD-013, Design Basis Document for the Reactor Core Isolation Cooling System, Rev. 9

Condition Reports

98-0155	03-4019	04-3303	05-1628	05-2889	05-3427*
98-0924	03-4549	04-4423	05-2385	05-3257*	05-3430*
01-3467	03-4748	04-4457	05-2601	05-3275*	05-3436*
02-1814	04-0285	04-4674	05-2716	05-3354*	05-3439*
02-2751	04-0301	05-0110	05-2747	05-3357*	05-3452*
03-0880	04-0994	05-0309	05-2836	05-3371*	05-3454*
03-3954	04-2576	05-1611	05-2845	05-3387*	05-3474*

(Note: "*" = Generated as a result of the inspection)

Drawings

DWG No. FP-19B, Condensate Lines – Yard, Rev. 22
FV-IJ, Drywell & Suppression Chamber Penetrations Location & Details, SH. 9, Rev. 12
DWG No. 328, Suppression Chamber Penetration X-228, Rev. 5
DWG No. FM-33D, Flow Diagram Condensate System 33, Rev. 26
11825-PFSK-1952 SH. 1 & SH. 2, Pipe Support, Lateral 16"-W20-302-15A, System 10, Rev. 2
DWG No. D980, Condensate Storage Tanks, Rev. 5
DWG No. 11825-SE-18AK, 125VDC Wiring Diagram Steam Line Drain VVS 13SOV-013 & 13SOV-035, Rev. 2
DWG No. FM-22A, Flow Diagram Reactor Core Isolation Cooling System 13, Rev. 52
DWG No. FM-22B, Flow Diagram RCIC Turbine Lube Oil System 13, Rev. 18
DWG No. FM-20A, Flow Diagram Residual Heat Removal System 10, Rev. 70
DWG No. FM-20B, Flow Diagram Residual Heat Removal System 10, Rev. 62
1.61-150, Elem Diag RCIC Sys, Rev. N
1.61-151, Elem Diag RCIC Sys, Rev. J
1.61-152, Elem Diag RCIC Sys, Rev. H
1.61-153, Elem Diag RCIC Sys, Rev. H
1.61-154, Elem Diag RCIC Sys, Rev. N
1.61-155, Elem Diag RCIC Sys, Rev. 11
1.61-156, Elem Diag RCIC Sys, Rev. F
1.61-157, Elem Diag RCIC Sys, Rev. E
11825-ESK-5BS, D.C. Elementary Diagram 4160V Ckt Emer. Bus 10500 Undervoltage Operation, Rev. 23
11825-ESK-5BT, D.C. Elementary Diagram 4160V Ckt Emer. Bus 10600 Undervoltage Operation, Rev. 24
11825-ESK-5BY, D.C. Elementary Diagram 4160V Ckt. Emer Bus 10500 Undervoltage, Rev. 6
11825-ESK-5BZ, DC Elementary Diagram 4160V Ckt. Emer Bus 10600 Undervoltage, Rev. 5
11825-FE-1H, 4160V One Line Diagram Sh. 4 Emergency Bus 10500, Rev. 13
11825-FE-1H, 4160V One Line Diagram Sh. 5 Emergency Bus 10600, Rev. 14

11825-LP-13A, Loop Diagram RCIC Steam Supply Pressure, Rev. 1
11825-LP-13B, Loop Diagram RCIC Steam Supply Pressure, Rev. 1
11825-LP-13C, Loop Diagram RCIC Stm Line Break Detector, Rev. 1
11825-LP-13E, Loop Diagram RCIC Stm Line Break Detector, Rev. 1
ESK-11AQ, Elem Diagram – 125VDC Ckts - MOV RCIC Sys. – Outbrd. Stm. Supp. Iso. & Stm. to Turb. MOV's, Rev. 17
ESK-11AR, Elem. Diagram – 125VDC Ckts – MOV RCIC System – Pump Suct. Condensate Stror. Tk MOV's, Rev. 14
ESK-11AS, Elem Diag. – 125VDC Ckts – MOV RCIC Sys – PP. Disc & Test By Pass to Cond. Stror. Tank & PDisch. MOV's, Rev. 11
ESK-11AT, Elem. Diagram – 125VDC Ckts MOV RCIC System – Pp. Suct, From Suppression Chamber MOV's, Rev. 13
ESK-11AU, Elem. Diagram – 125VDC Ckts MOV RCIC System – Min Flow Bypass to Supr. Cham. & Turb. Cool. Wtr. MOV's, Rev. 10
ESK-5BU, D.C. Elementary Diagram 4160V Ckt. Residual Heat Removal Pump 10-P-3B, Rev. 24
ESK-5BV, D.C. Elementary Diagram 4160V Ckt. Residual Heat Removal Pump 10-P-3B, Rev. 23
ESK-5BW, D.C. Elementary Diagram 4160V Ckt. Residual Heat Removal Pump 10-P-3C, Rev. 22
ESK-5BX, D.C. Elementary Diag. 4160V Ckt Residual Heat Removal Pump 10-P-3D, Rev. 25
ESK-6ML, Elementary Diagram 600V. Ckts – MOV RHR PP's 10P-3A & B Min. Flow Bypass VV's 10MOV-16A & B, Rev. 14
ESK-6MN, Elem. Diag. 600V Ckts – MOV RHR Heat Exchanger Drain to Suppression Pool VVs, 10MOV-21A & 21B, Rev. 11
ESK-6MP, Elementary Diagram 600 Ckts – MOV RHR Inboard VV's 10MOV-25A & B, Rev. 22
ESK-6MT, Elementary Diagram 600 Ckts – MOV Containment Spray VV's 10MOV-34A & B, Rev. 10
ESK-8J, A.C. Elementary Diagrams Station Ser. Busses MET & Relaying Ckt., Rev. 10
FE-1A, Main One Line Diagram Generator & Main Transformer, Rev. 19
FE-1AH, 125V DC One Line Diagram Sheet 1, Rev. 26
FE-1AJ, 125V DC One Line Diagram Sheet 2, Rev. 20
FE-1AK, 125V DC One Line Diagram Sheet 3, Rev. 14
FE-1AL, 125V DC One Line Diagram Sheet 4, Rev. 27
FE-1AM, 125V DC One Line Diagram Sheet 5, Rev. 9
FE-1AN, 125V DC One Line Diagram Sheet 6, Rev. 18
FE-1AP, Power Source 120V AC System, Rev. 7
FE-1AX, 125V DC One Line Diagram Sheet 7, Rev. 20
FE-1B, Main One Line Diagram Sh. 2 Station Service Transformers, Rev. 11
FE-1C, Main One Line Diagram Sheet 3 345KV Switchyard, Rev. 13
FE-1D, Main One Line Diagram Sh. 4 115KV Switchyard, Rev. 9
FE-1I, 600V One Line Diagram Sheet 2 SWGR 71L15 & 71L16 71MCC-153 & 71MCC-163, Rev. 32
FE-3DE, External Connections Residual Heat Removal Panel 09-33 Sh. 1 System 10, Rev. 22
FE-3GJ, Ext Conn Diagram Main Control Board – Sect 09-3, Rev. 16
FE-3NC, Wiring Diagram Terminal Box JB-RHR115 System 10, Rev. 3

FE-3UL, Internal and External Connection Diagram Auxiliary Shutdown Panel 25ASP-2, Rev. 3
FE-3UM, Internal and External Connection Diagram Auxiliary Shutdown Panel 25ASP-2, Rev. 5
FM-22A, Flow Diagram Reactor Core Isolation Cooling System 13, Rev. 52
SE-9GT, 600V Wiring Diagram 10MOV-021B Syst. 10, Rev. 8

Engineering Evaluations

TSP No. 97-024, Shield Floor Drain Line Near RCIC Sump Area, dated 9/9/97
A384.F02-06, James A. FitzPatrick Nuclear Power Plant: Strainer Performance Analysis, Rev. 2A
F1-98-100, High Pressure Coolant Injection and Reactor Core Isolation Cooling Suppression Pool Suction Strainer Replacement
JAF-05-27462, Evaluate Potential for H2 Detonation in RHR Piping Between 10MOV-70 and 10PCV-69
JAF-SE-98-013, Residual Heat Removal and Core Spray Suppression Pool Suction Strainer Replacement, Rev. 3

Miscellaneous Documents

PEP-APL-95-017, Torus Preservation Action Plan, Rev. 4
MP-059.12, Swing Check Valves Without Operators (ISI), dated 10/1/04
DBD-010, Design Basis Document for the Residual Heat Removal System, Rev. 11
DBD-013, Design Basis Document for the Reactor Core Isolation Cooling System, Rev. 9
JENG-05-0059, JAF Expert Panel Meeting Minutes (February 15-16, 2005), dated 3/8/05
Project No. 7CN104, Project Plan for HPCI/RCIC Level Compensation Project, dated 7/27/05
JAF-RPT-MULTI-03365, James A. FitzPatrick Nuclear Power Plant Inservice Testing Program for Pumps and Valves Third Interval Plan, Rev. 8
JAF-RPT-RHR-02281, Maintenance Rule Basis Document for System 010 Residual Heat Removal System, Rev. 7
JAF-RPT-RCIC-02284, Maintenance Rule Basis Document for System 013 Reactor Core Isolation Cooling System, Rev. 4
Risk-Informed Inspection Notebook For James A. FitzPatrick Nuclear Power Plant , Rev. 1
James A. FitzPatrick Nuclear Power Plant Individual Plant Examination, dated August 1991
JAF-RPT-MISC-02211, James A. FitzPatrick Nuclear Power Plant Individual Plant Examination of External Events, dated June 1996
MP-013.01, RCIC Turbine Disassembly, Inspection, and Reassembly, Rev. 9

Normal and Special (Abnormal) Operations Procedures

AP-02.06 Procedure Use and Adherence, Rev. 16
AP-12.06, Equipment Status Control, Rev. 9
ARP 09-6-2-20, CST A or B TEMP LO, Rev. 6
AP-16.01, Plant Label Program, Rev. 4
AOP-49, Station Blackout, Rev. 11
EOP-2, RPV Control, Rev. 7
EOP-3, Failure to Scram, Rev. 7
EOP-4, Primary Containment Control, Rev. 7

EOP-11, EOP & SAOG Graphs, Rev. 0
EP-5, Termination and Prevention of RPV Injection, Rev. 3
EP-6, Post Accident Containment Venting and Gas Control
EP-10, Fire Water Crosstie to RHRSW Loop A When Directed by EOP-4 or SAOGs, Rev. 1
EP-13, RPV Venting, Rev. 2
ISP-75, HPCI CST Low Water Level Switch Functional Test/Calibration, Rev. 22
IS-E-04, Installation and Modification of Electrical Raceways, Rev. 3
OP-13, Residual Heat Removal System, Rev. 92
OP-13A, RHR - Low Pressure Coolant Injection, Rev. 12
OP-13B, RHR - Containment Control, Rev. 8
OP-19, Reactor Core Isolation Cooling System, Rev. 44
OP-43C, LPCI Independent Power Supply System, Rev. 17
OP-43A, 125 VDC Power System, Rev. 22
OP-65A, Normal Operation, Rev. 1
MP-071.05 Outdoor Heat Tracing Inspection and Testing, Rev. 13
MST-071.30 LPCI Charger-Inverter-Battery Surveillance Tests, Rev. 10

Operating Experience

NRC Information Notice 02-15, Supplement 1: Hydrogen Combustion Events in Foreign BWR Piping, dated 5/6/03
NRC Information Notice 96-60: Potential Common-Mode Post-Accident Failure of Residual Heat Removal Heat Exchangers, dated 11/14/96
JAF Response to NRC Bulletin 95-02, Unexpected Clogging of Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode; dated 11/16/95, 12/5/95, and ½3/97
JAF Response to NRC Generic Letter 95-07, Pressure Locking and Thermal Binding of Safety-Related Power-Operated Gate Valves, dated 2/13/96
JAF Response to NRC Bulletin 88-04, Potential Safety-Related Pump Loss; dated 7/22/88, 11/9/88, and ½5/89
JAF Response to NRC Generic Letter 97-04, Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps, dated 12/23/97
JAF Response to Potential 10CFR Part 21 Report No. 40 Concerning the Inconel Valve Stems from Dresser-Rand (DER-98-01144)

Operator Job Performance Measures

22301004B Venting The Drywell to Reduce Containment Pressure
20501078 Fire Water Cross Tie to RHRSW Loop A When Directed By EOP-4 or SAOGS

Operator Lesson Plans

SDLP-13 Reactor Core Isolation Cooling System, Rev. 9
SDLP-10 Residual Heat Removal System, Rev. 14

Surveillance Test Procedures

ST-2AL, RHR Loop A Quarterly Operability Test (IST), dated 2/7/05, 5/8/05, and 8/2/05
ST-2AM, RHR Loop B Quarterly Operability Test (IST), dated ½7/05 and 8/2/05
ST-24J, RCIC Flow Rate and Inservice Test (IST), dated 1/10/05 and 4/21/05
ST-2Y, RHR Heat Exchanger Performance Test, dated 2/28/05
ST-24A, RCIC Monthly Operability Test, Rev. 44, completed 6/2/05
ST-24E, RCIC Logic System Functional and Simulated Automatic Actuation Test, Rev. 32
RHR Loop A, Valve/Electrical Lineup, completed 2/4/04
RHR Loop B, Valve/Electrical Lineup, completed 2/4/04
ST-2AJ, RHR Loop A Containment Spray Headers and Nozzles Air Test (ISI), Rev. 3, completed 10/23/2000
ST-2AK, RHR Loop B Containment Spray Headers and Nozzles Air Test (ISI), Rev. 3, completed 10/23/2000

System Health Reports & Trending

Residual Heat Removal 1st Quarter 2005
RCIC System-013 1st Quarter 2005
RHR Motor Stator Winding Temperature Trending
PdMA Corporation Oil Analysis Data Sheet Report (RCIC Turbine), dated 2/8/02 - 4/6/05
PdMA Corporation Oil Analysis Data Sheet Report (RHR Pump A-D Motors), dated 10/15/01 - 2/27/05

Vendor Technical Manuals

Woodward Governor Company, EG-M Control Manual

Work Orders

WO-JAF-03-28250 71SB-1 Quarterly Surveillance
WO-JF-020817300 71SB-1 Service Test
WO-JF-030219100 71SB-1 Quarterly Surveillance
WO-JF-030563300 "B" LPCI Battery Perfomance Test
WO-JF-980603800 71SB-2 Modified Performance Test
WR 00-05947-00 "A" LPCI Battery Service Test
WR 00-07102-00 71SB-2 Service Test
WR 94-10245-00 "B" LPCI Battery Modified Performance Test
WR 97-00116-00 "A" LPCI Battery Modified Performance Test
WR 97-00658-00 71SB-1 Performance Discharge Test
WR 98-06037-00 71SB-1 Service Test
WR 98-06770-00 71SB-2 Service Test

LIST OF ACRONYMS

CR	Condition Report
CST	Condensate Storage Tank
ECCS	Emergency Core Cooling System
HPCI	High Pressure Coolant Injection
ISI	In-Service Inspection
IST	In-Service Test
JAF	James A. FitzPatrick Nuclear Power Plant
LER	Licensee Event Report
LPCI	Low Pressure Coolant Injection
MOV	Motor Operated Valve
NPSH	Net Positive Suction Pressure
OE	Operating Experience
PRA	Probabilistic Risk Assessment
QA	Quality Assurance
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal
SBO	Station Blackout
SPC	Suppression Pool Cooling
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report