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NewYork Power Authority

November 30,1984
JPN-84-77

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Domenic B. Vassallo
Operating Reactors Branch No. 2
Division of Licensing

Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Supplement No. 1 to NUREG-0737 (Generic Letter 82-33)
Regulatory Guide 1.97, Revision 2
Implementation Report

References:
1. NRC Generic Letter No. 82-33 to all Licensees of Operating Reactors dated December 17, 1982 (includes Supplement No. 1 to NUREG-0737).
2. PASNY letter, J.P. Bayne to D.B. Vassallo, dated April 15, 1983 (JPN-83-33) regarding the same subject.
3. NRC letter, D.B. Vassallo to J.P. Bayne, dated June 12, 1984 regarding Order confirming licensee commitments on emergency response capability.

Dear Sir:

Generic letter No. 82-33 (Reference 1) transmitted to the Authority Supplement No. 1 to NUREG-0737 which replaced the corresponding requirements for five NUREG-0737 items. Via Reference 2, the Authority submitted a schedule for completing each of the basic requirements and a description of our plans for the phased implementation and integration of these emergency response activities. The NRC subsequently confirmed these commitments with an Order dated June 12, 1984 (Reference 3).

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In accordance with the Authority's commitments, attached is a document entitled "Response to Regulatory Guide 1.97, Revision 2 for James A. FitzPatrick Nuclear Power Plant" (Attachment No. 1). As outlined in Section 6.2 of Supplement No. 1 to NUREG-0737, this report describes how the Authority plans to implement the guidance of Regulatory Guide 1.97 Rev. 2. A table (included in Section 6 of the attached report) summarizes, for each of five variable types; instrument range, environmental qualification, seismic qualification, quality assurance classification, redundance, power supply, and display location. Deviations from the Regulatory Guide and the supporting justification or alternatives are presented in Sections 3. Section 4 describes those modifications that will be implemented at FitzPatrick. Schedules for implementation are included as Attachment No. 2. These schedules (with the exception of the dates included in this letter) are for information only and should not be construed as formal Authority commitments.

The Authority has scheduled the implementation of Regulatory Guide 1.97 (Revision 2) type A variables for thirty days after the end of the 1986 (Reload 7/Cycle 8) refueling outage or December 31, 1986, whichever is later. Remaining variables (types B, C, D and E) will be implemented thirty days after the end of the 1987 (Reload 8/Cycle 9) refueling outage or December 31, 1987, whichever is later. Specifically excluded from these schedules is the installation of unique identification labels for existing instruments that meet Regulatory Guide 1.97 (Revision 2) criteria; these labels will be installed as part of the FitzPatrick Detailed Control Room Design Review (DCRDR) program.

This schedule is necessary because of the long lead time required for some new or replacement equipment and the numerous modifications (Analog Trip Transmitter System, SPDS, new Emergency Operation Facility, torus program, ADS check valve replacement, ADS piping analysis, fire protection, etc.) currently in progress.

By providing a schedule linked to refueling outages, the Authority has considered the need for scheduled refueling outages to complete equipment installation. By linking the schedule to a fixed date, the Authority has also considered the possibility that anticipated mid-cycle outages might be cancelled resulting in a refueling outage taking place sooner than anticipated. If this were to occur, and the schedule were based solely on the refueling outage, unavoidable schedule extensions may be necessary.

If you require any additional information, please contact Mr. J.A. Gray, Jr. my staff.

Very truly yours,

C. A. McNeill, Jr.
Senior Vice President
Nuclear Generation

cc: Office of the Resident Inspector
U. S. Nuclear Regulatory Commission
P.O. Box 136
Lycoming, New York 13093

ATTACHMENT NO. 1 to JPN-84-

NEW YORK POWER AUTHORITY
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

Regulatory Guide 1.97, Revision 2, Implementation at the James A. FitzPatrick Nuclear Power Plant

Docket No. 50-333

November 30,1984

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1.0 Introduction

This report provides an assessment of the extent to which the New York Power Authority's James A. Fitzpatrick (JAF) Nuclear Power Plant meets the recommendations of Revision 2 to Regulatory Guide 1.97 (Reference 2). The information provided herein meets the requirements of Supplement 1 to NUREG-0737, Section 6.0 (Reference 2), with the exception that sensor locations are not identified in the report.

Section 2.0 of this report describes the evaluation methods used in preparing this assessment. Section 3.0 lists by variable type, specific exceptions to Regulatory Guide 1.97 Revision 2 recommendations, and justification as to why certain exceptions are acceptable. Section 4.0 describes proposed modifications to increase the extent of JAF's conformance to the Regulatory Guide. Section 5.0 summarizes the results of this assessment. Section 6.0 (Position Summary Tables) summarizes the design criteria of Regulatory Guide 1.97 and compares JAF to Regulatory Guide 1.97 Rev. 2.

In most cases, JAF meets the recommendations of the guide. Where exceptions to the guide are considered acceptable, technical justification is provided based upon plant specific designs, operation, or alternatives recommended by industry groups. This is discussed further in Section 3.0.

2.0 Evaluation Method and Criteria

2.1 Regulatory Guide 1.97 defines five types of variables (designated A through E) to be monitored following a postulated accident at a nuclear power plant. Type A variables are plant specific and were determined by reviewing existing FitzPatrick Emergency Operating Procedures, BWROG Generic Emergency Procedure Guidelines, and draft FitzPatrick Emergency Operating Procedures. Variable types B, C, D and E are generic and listed in Regulatory Guide 1.97 Table No. 1. Plant documentation was reviewed to determine and evaluate the instruments which measure each Regulatory Guide variable. These documents included: system flow diagrams; instrument loop drawings; wiring diagrams; plant modification packages; FSAR and Technical Specifications; purchase specifications; and, documents relating to radiation or environs monitoring.

2.2 Variables listed in Regulatory Guide 1.97 Table No. 1 under multiple "type" headings have been assigned more than one design category, based upon their specific function. Instrument conformance to the Regulatory Guide was based upon the most stringent design category.

2.3 Reference documents and information used in this evaluation are decribed in greater detail in Sections 2.4, 2.5 and 2.6. The results of this evaluation are summarized in the Position Summary Tables, Section 6.0.

2.4 In May of 1983, the Authority submitted a document entitled, "Response to 10 CFR 50.49 (Reference 13)." The purpose of submittal was to specifically meet the requirements stated in subsection (g) of 10 CFR 50.49. The submittal identified safety-related electrical equipment which is located in a harsh environment and is required to mitigate or monitor an accident. It identified equipment not yet qualified. Such equipment was to be either qualified for interim operation, relocated to a less demanding environment, or replaced. This submittal takes credit for commitments to qualify equipment by the January 1985 refueling outage. In general, instrumentation designated as Category 1 and 2 and located in a mild environment as a minimum meets the environmental qualification criteria of IEEE-323-1971, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Generating Stations", (Reference 8). This was the plant operating license design basis for safety related, QA Category I equipment. Category 1 & 2 instruments that have been installed as part of recent modification packages were qualified to NUREG-0588 (Reference 10) and IEEE-323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Generating Stations", (Reference 9).

2.5 Instrumentation installed under the original plant licensing requirements was specified to meet the seismic qualification requirements of IEEE-344-1971, "Seismic Qualification of Class 1E Equipment for Nuclear Generating Stations,". Category 1 and 2 instrumentation which has been installed recently as part of plant modification packages was qualified to NUREG-0588 (Reference 10) and IEEE-344-1975, "Seismic Qualification of Class 1E Equipment for Nuclear Generating Stations," (Reference 12).

2.6 Power sources for post accident instrumentation will meet, or exceed, the requirements of Regulatory Guide 1.97, Revision 2.

2.6.1 Category I instrumentation is powered from one of the following sources:

- Class 1E 120VAC Emergency Buses
- Class 1E 120VAC Safeguard Buses
- Class 1E 120VAC Reactor Protection System Buses

Note: The above power sources are part of the onsite Class 1E power distribution systems which are backed by the Emergency Diesel Generators. The Class 1E power systems meet the requirements of Regulatory Guide 1.32, Rev. 2 "Criteria for Safety-Related Electric Power Systems for Nuclear Power Plants" (Reference 14).

2.6.2 Category 2 instrumentation is powered from one of the following sources:

- Non-safety 120VAC Normal Buses
- Non-safety 120VAC Common Bus
- Class 1E 120VAC Emergency Buses
- Class 1E 120VAC Safeguard Buses
- Class 1E 120VAC Reactor Protection System Buses
- 120VAC Uninterruptible Power Supply (UPS) Bus

The non-safety 120VAC Normal Buses (which are part of the normal AC power distribution system) supply the Turbine Building and Radwaste Building Exhaust Monitors (Noble Gases).

The non-safety 120VAC Common Bus (which is also part of the normal AC power distribution system, has its feeder automatically transferred between two non-safety motor control centers (MCC) when one feeder source is lost. This common bus supplies the Reactor Building Area Radiation Monitors and the RHR Heat Exchanger Outlet Temperature Monitor.

The Class 1E 120VAC Emergency Buses supply the Refueling Floor Exhaust Monitors (Noble Gases).

The Class 1E 120VAC Safeguard Buses supply the RHR flow, and Core Spray flow instrumentation.

The Class 1E 120VAC Reactor Protection System Buses supply the Reactor Building (Lower Level) Vent Monitor (Noble Gases).

The 120VAC Uninterruptible Power Supply (UPS) Bus receives its power from a dual motor UPS motor generator (M-G) set. The AC motor is powered from a Division "B" Class 1E MCC. Upon loss of AC power, feed to the UPS M-G set is from the DC motor which receives its supply from the Division "A" 125VDC battery. The UPS Bus supplies the Stack Gas Monitors (Noble Gases), Hi-Range Turbine Building and Hi-Range Radwaste Building Exhaust Monitors (Noble Gases), SRV Position instrumentation, RCIC flow instrumentation, HPCI flow instrumentation, and SLCS level instrumentation.

2.6.3 Category 3 instrumentation is powered from one of the following sources:

- Non-safety 120VAC Normal Buses
- Class 1E 120VAC Emergency Bus B3
- 120VAC Uninterruptible Power Supply Bus

The majority of Category 3 instrumentation is powered by non-safety 120VAC Normal Buses.

The Class 1E 120VAC Emergency Bus B3 serves as the emergency source of Sample Panel 27SSC-PNL1.

The 120VAC UPS supplies the Main Feedwater flow instrumentation.

2.6.4 A detailed discussion of the 120VAC power distribution systems can be found in FSAR Chapter 8.

3.0 JAF Exceptions and Justifications

3.1 In this section, a number of variables are identified as not fully meeting the requirements of Regulatory Guide 1.97, Rev. 2. In each of these cases, the Power Authority believes that these exceptions are justified. In general, justification is based on one or more of the following factors:

- The instrumentation used to monitor the variables provides the required information but not in the exact form recommended by Regulatory Guide 1.97, (e.g., several instruments with overlapping ranges fullfill the function of a single wide range instrument).

- Other qualified indications are available to provide the required information (as discussed in Section 3.2).

- Industry groups such as the BWR Owners Group (BWROG) and NUTAC have evaluated the requirements of the Regulatory Guide and have concluded that there are acceptable alternatives to the requirements. In cases where the Power Authority agrees with these industry positions, they have been referenced in the detailed discussions that follow.

- The requirements of the Regulatory Guide do not accurately reflect the importance of certain instrumentation for the FitzPatrick plant.

- The information provided by the instrumentation is not required. (e.g., it is unnecessary to monitor radiation levels in areas which are in direct contact with primary containment where penetrations and hatches are located since access to these areas is not required for any reason following an accident).

- Revision 3 of Regulatory Guide 1.97 provides an alternative requirement to Revision 2 which the Power Authority finds more acceptable.

3.2 Suppression Pool Water Temperature (A-3, D-6)

The installed instrumentation consists of 16 temperature sensors distributed around the suppression pool which display on a data logger in the control room. Individual area, as well as bulk pool, temperature measurement can be indicated. The temperature sensors are fully qualified in accordance with Category 1 design criteria. The system is single channel and powered from a single power source, 120\AC safety related Bus-B1. Suppression pool temperature sensing therefore does not meet single failure criteria.

The existing instruments will meet Category 2 design criteria, once the data logger is upgraded to QA Category I. In addition to the above described instrumentation, there are redundant channels of pool temperature measurement with continuous indication in the control room. These instrument loops will meet Category 1 design criteria once their power source is upgraded to redundant 1E supplies.

This combined measurement capability assures that the operator will be provided the pool temperature information required to make decisions regarding preplanned manual actions assuming a single failure. With a minor upgrade of power sources, the existing instrumentations will meet the objective of Regulatory Guide 1.97.

3.3 Neutron Flux (B-1)

The instrumentation presently installed for the source range neutron monitoring (SRM) system consists of three groups of monitors with four channels in each group (one group of SRM's and two groups of Intermediate Range Monitors (IRM). The source range monitors have a range of 0.1 to 10^6 counts per second. In the power range, neutron flux is monitored by fixed in-core ion chambers which are arranged in a uniform pattern throughout the core. These chambers cover a range of approximately 1% to 125% of rated power with a linear scale. The average power range level is measured by six average power range monitors (APRM). Each monitor measures bulk power in the core by averaging signals from 14 or 17 LPRM signals.

The source range and power range neutron monitoring instruments are continuously displayed (indicator and strip chart recorder) in the control room. The SRM and IRM detectors and monitors are powered from the 24 VDC Buses (station batteries), and the strip chart recorders are powered from the 120 VAC UPS Bus. The power range detectors and monitors are powered from the 120VAC, RPS Bus A and B, and the strip chart recorders are powered from the 120VAC UPS Bus.

The source range neutron monitoring instruments are not environmentally qualified, but are seismically qualified to original plant licensing requirements. As previously stated (Reference 13), the Authority considers that there is no equipment in this system requiring qualification per 10 CFR 50.49 based on the system's design basis.

It is the NUTAC position that a rigorous Category 1 design criteria is not justified when the purpose and use of the measurement is analyzed. In addition, a qualification upgrade (environmental and electrical) is not needed since boron sampling and CRD position indication provide adequate backup. ''TAC has also taken exception to the lower end of the Regulatory Guide 1.97 specified range based on an approach to criticality scenario. In addition, diversity is provided by the overlapping regions of the source range detectors and also by the boron concentration data from the post accident samling system.

3.4 Drywell Sump Level (C-6) (B-8)

The instrumentation which measures drywell sump level consists of narrow range (15-45 inches), single monitor channel drywell equipment drain sump and drywell floor drain sump. Both sumps are located inside the drywell (containment). Only one of these sumps has a seismically and environmentally qualified level transmitter. Each sump level is indicated in the Control Room on a strip chart recorder. Each recorder is powered from an emergency bus. The recorders are QA Category II.

Two additional drywell level measurement channels provide overlapping, wide range, (0-100 feet), monitoring. These instruments meet Category 1 design criteria.

The BWR Owners Group has taken the position that this variable should be implemented as Category 3.

The Authority believes the above instruments are adequate for the purpose of drywell sump level monitoring. The following discussion supports this conclusion.

The BWR Mark I drywell has two drain sumps. One drain is the equipment drain sump, which collects identified leakage; the other is the floor drain sump, which collects unidentified leakage.

Although the level of the drain sumps can be a direct indication of breach of the Reactor Coolant System Pressure Boundary, other instrumentation required by Regulatory Guide 1.97 will detect leakage in the drywell before sump level instrumentation. In the case of the small line break, drywell pressure will increase before a noticable increase in sump level. In addition, drywell temperature and primary containment radiation will increase, both monitored by Regulatory Guide 1.97 instruments. Large line breaks would flood sumps rapidly and render narrow range measurement useless.

The drywell sump level signal neither automatically initiates safety-related systems nor alerts the operator to the need to take safety related actions. Regulatory Guide 1.97 requires instrumentation to function during and after an accident. The drywell sump systems are deliberately isolated by an accident signal to establish containment integrity; therefore, the drywell sump level is not a useful accident monitoring variable.

3.5 Radiation Exposure Rate (C-14, E-2, E-3)

The installed area radiation monitors (ARM) have a range of 10^{-1} to 10^{3} MR/HR. These units are not presently environmentally qualified. We believe the existing system is adequate since following an accident, there is no requirement to enter areas monitored by ARMs. The present four decade system is adequate for monitoring plant areas under normal operating conditions. In addition, in an accident situation, local radiological surveys for beta and gamma dose rates as well as airborne activity samples would be required prior to entry, and would provide the necessary exposure rate information.

This above position is supported by an evaluation which was performed to comply with a requirement of Emergency Preparedness Appraisal 50-33/83-03, Appendix B, Item 11 (Reference 18). In addition, it is the BWR Owner's Group position that using radiation exposure rate monitors to detect primary containment breach is neither feasable nor necessary. The Authority endorses this postion.

3.6 Standby Liquid Control System Flow (D-17)

There is no direct indication of the Standby Liquid Control System (SLC) flow provided to the operator in the Control Room. The SLC system is manually initiated and the SLC system pump discharge header pressure is indicated in the Control Room and indicates SLC system pump operation. In addition, the operator can verify the proper functioning of the SLC system by monitoring the following on the control room panels:

- Loss of continuity to squib valve annuciator
- Loss of amber squib valve ready lights

- Pump has red light-indicates running
- SLC pump discharge pressure is greater than reactor pressure
- Decreasing SLC tank level
- Reactivity change in the reactor as measured by Neutron Monitoring instrumentation

We believe that the above list of indirect indications provide adequate information to verify SLC system operation.

The BWR Owners Group position supports our conclusion that monitoring the SLC system can be adequately done by measuring other variables associated with the system.

3.7 High Radioactivity Liquid Tank Level (D-23)

Level indication is not provided in the Control Room for the high radioactivity liquid tank. The JAF plant is designed so that the pump discharge from the drywell floor and equipment drains sump pump is automatically isolated by an accident signal. Furthermore, before radioactive liquid waste can be forwarded to radwaste, Control Room operators must verify with radwaste operators that there is sufficient capacity in the radwaste systems to accomodate the wastes.

Plant design and administrative controls preclude the need to indicate this level in the Control Room. The NUTAC R.G. 1.97 Implementation Guideline (Reference 7) supports our position that the display of this variable in the Radwaste Control Room is adequate, and indication in the Control Room is not required.

3.8 Trend Recording

It is the BWROG and NUTAC position that dedicated recorders are necessary only where trend information is immediately required for operator use. The current value (indicated) of the variables is normally used by the operator for decision making purposes.

3.9 Laboratory Analysis (E14, C2, B3)

The analytical procedures at JAF provide adequate range, sensitivity, and accuracy to evaluate post-accident status with the exception of dissolved gases due to sample system inadequacy, (refer to Section 4.17). Data from post-accident sample analysis will be provided to the operator by the radiation chemistry lab as required. Presently, there is no on-line data link between the Chemistry Lab and Control Room.

4.0 Proposed Modifications

4.1 A number of exceptions to the recommendations of Regulatory Guide 1.97 Rev. 2 have been identified in this assessment. The following modifications are proposed for future installation. These additions and changes will comply with the requirement of Regulatory Guide 1.97 Rev. 2.

4.2 RPV Water Level (A-2, B-4)

The range of existing RPV Water level instruments will be extended to meet the recommendations of the Regulatory Guide. This will be accomplished by recalibrating one existing instrumentation channel and adding a second channel with trend recording.

4.3 Drywell Temperature (A-7, D-7)

The Category 1 design criteria will be met by adding continuous indication in the Control Room of the two existing temperature loops in the area of the reactor and adding a trend recorder to one channel. Drywell cooler inlet and outlet air temperature sensors will be replaced with fully qualified units. The power supply to each loop will be upgraded to Class 1E redundant sources, and a trend recorder added to one channel.

4.4 Suppression Chamber Pressure (A-8)

Fully qualified Class IE pressure transmitters will be installed. Continuous indication will be installed in the Control Room with one channel trend recorded. Power for these loops will be upgraded to redundant Class 1E power sources.

4.5 Containment Oxygen Concentration (A-11, C-12)

The existing analyzer is not qualified. A new fully qualified system will be installed to meet the Category 1 design criteria.

4.6 Primary Containment Isolation Valve Position (B-10)

The instrumentation presently installed for the indication of containment isolation valve position consists of indicating lights on Control Room and Relay Room panels. Position indication for those containment isolation valves which have their indicating lights on panels in the Relay Room will also be provided in the Control Room.

4.7 Drywell/Suppresion Chamber Spray Flow (D-3, D-8)

The existing instrumentation meets all Category 2 design criteria. However, the range of RHR System indicated flow is 25,000 GPM per loop, and the operator is required to throttle the combined flow of both RHR Loops. In order to display flow measurement with acceptable resolution, new flow measurement loops will be added in the branch lines to the drywell and suppression chamber spray headers. The range will envelope the requirement of 110% design flow with a more appropriate margin. The flow instrumentation will meet all Category 2 design requirements.

4.8 MSIV Leakage Control System Pressure (D-9)

MSIV Leakage Control System Pressure is not indicated in the Control Room. Two pressure measurement loops will be installed (MSLCS Train A & B). These loops will provide on-demand indication in the Control Room Emergency and Plant Information Computer (EPIC). The instrumentation will meet all Category 2 design criteria.

4.9 RHR Heat Exchanger Outlet Temperature (D-20)

The existing temperature sensors will be replaced with fully qualified sensors. The temperature measurement will be indicated on-demand on the Control Room EPIC console.

4.10 Cooling Water Temperature to ESF System Components (D-21A)

The existing temperature sensor will be replaced with one which is fully qualified. The temperature measurement will be indicated on-demand in the Control Room Emergency and Plant Information Computer (EPIC) console.

4.11 RHR Service Water Temperature (D-21B)

The existing temperature sensor will be replaced with one which is fully qualified. The temperature measurement will be indicated on-demand on the Control Room EPIC console.

4.12 Reactor Building Flood Level (Potential D Variable)

Present plant instrumentation does not provide for measurement of flooding in the reactor building. In the review of the plant emergency operating procedures, the need to measure this parameter was identified. Reactor building flood level has been classified as a type D variable, because it provides information to indicate the operation of individual safety systems and other systems. It also provides information to the operator for making decisions in using the individual systems which mitigate the consequences of a accident.

Therefore, a level measurement loop will be installed in the lower elevation of the Reactor Building. Instrumentation will be qualified in accordance with Cateqory 2 design criteria. The level measurement will be indicated on-demand in the Control Room EPIC console.

4.13 Vent Exhaust Flow Rate (E-4)

Presently, only local measurement of vent exhaust flow is installed. Instrumentation to measure this parameter will be installed in the Reactor Building, Turbine Building, Radwaste Building exhaust vents, and the plant stack. The flow indication will be displayed on the Control Room EPIC console.

4.14 Secondary Containment Purge - Vent Flow Rate (E-4.2)

The existing flow transmitter will either be qualified by analysis or replaced with a fully qualified unit. Indication is presently available in the Control Room.

4.15 Emergency Ventilation Damper Position

Emergency Ventilation Dampers not presently having position indication will be equipped with position switches and indication will be provided in Control Room. Those Dampers not presently equipped with qualified switches will be upgrade as part of the on going Equipment Qualification Program.

4.16 Status of Standby Power and other Energy Sources Important to Safety.

Bus voltages which require Control Room indication will be added to the Plant Emergency Computer (EPIC) Input List and displayed on demand in the Control Room.

4.17 Primary Coolant and Sump Accident Sample

New equipment will be added to the existing Sample System to provide capability for measurement of dissolved gases.

5.0 Summary

Since the issuance of Regulatory Guide 1.97 and NUREG-0737, JAF has completed a number of modifications to comply with these documents. We believe these modifications in addition to modifications proposed in Section 4.0 of this report will bring JAF to an adequate level of conformance with the requirements of Regulatory Guide 1.97, Rev. 2.

This report provide the documentation required by Supplement No. 1 to NUREG-0737 (Section 6.2). Variables A through E of Regulatory Guide 1.97 will be displayed on demand on the JAF Emergency and Plant Information Computer, which will have display consoles in the Technical Support Center (TSC) and in the Emergency Operations Facility (EOF).

6.0 Position Summary Tables

The tables in this section present the information required by Regulatory Guide 1.97 for the James A. FitzPatrick Nuclear Power Plant. They compare the plant with the requirements of the guide and thus demonstrate the plants degree of conformance.

Where modifications have been proposed, they are identified in the comments column. Where exception has been taken to a requirement of Regulatory Guide 1.97, this has also been noted in the comments column.

Where the word "EPIC" appears under the Technical Support Center (TSC) or Emergency Operations Facility (EOF) column, it means that that parameter is displayed in the TSC or EOF.

The Emergency and Plant Information Computer (EPIC) is an integrated system that combines SPDS functions, plant process computer functions (including NSSS and BOP) and supplementary operator aids. Each Regulatory Guide 1.97 variable implemented at FitzPatrick will be avaliable via the EPIC system in both the Technical Support Center (TSC) and Emergency Operations Facility (EOF), with the exception of meteorological variables which will be provided by a separate computer system. Refer to the Authority's "SPDS Implementation Plan" for further information on these systems.

J.A. FITZPATRICK NUCLEAR POWER PLANT
REGULATORY GUIDE 1.97, REVISION 2 ASSESSMENT
POSITION SUMMARY TABLES

ITEM	VARIABLE		CAT.	QA	INSTRUMENT RANGE	ENV. QUAL.	SEIS. QUAL.	REDUNDANT	POWER SUPPLY	CONTROL ROOM INDICATION	TSC	EOF	COMMENTS
A1	RCS Pressure	R.G. 1.97	1	I	15 psia to 1500 psig	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-1500 psig	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	
A2	Coolant Level in in Reactor Vessel	R.G. 1.97	1	I	Bottom of Core to Main Steam Line	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Inadequate Range
		NYPA	1	I	-100 in. to +224.5 in.	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (1 ch.)	EPIC	EPIC	Refer to Para. 4.2
A3	Suppression Pool Water Temperature	R.G.	1	I	30°F to 230°F	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Requires Qualification
		NYPA	1	II	30°F to 230°F	No	No	No	UPS	On demand data logger	EPIC	EPIC	Refer to Para. 3.2
A4	Suppression Pool Water Level	R.G. 1.97	1	I	ECCS Suction to Normal +5 ft.	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-30 ft.	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	

J.A. FITZPATRICK NUCLEAR POWER PLANT
REGULATORY GUIDE 1.97, REVISION 2 ASSESSMENT
POSITION SUMMARY TABLES

ITEM	VARIABLE		CAT.	QA	INSTRUMENT RANGE	ENV. QUAL.	SEIS. QUAL.	REDUNDANT	POWER SUPPLY	CONTROL ROOM INDICATION	TSC	EOF	COMMENTS
A5	Drywell Pressure	R.G. 1.97	1	I	0-110% design pressure	Cat. 1	Cat. 1	Yes	1E	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	-5 psig to +250 psig (0-520%)	Cat. 1	Cat. 1	Yes	1E	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
A6	RHR System Flow	R.G 1.97	1	I	0-110% design flow	Cat. 1	Cat.1	Yes	1E	Continuous & 1 ch. recorded	-	-	Meets the intent of R.G. 1.97
		NYPA	1	I	0-108% design flow	Cat. 1	Cat. 1	Yes	1E	Indicator (2 ch.) 1 ch. recorded	EPIC	EPIC	
A7	Drywell Temperature	R.G 1.97	1	I	40°F to 440°F	Cat. 1	Cat. 1	Yes	1E	Continuous & 1 ch. recorded	-	-	Requires Qualification Refer to Para. 4.3
		NYPA	1	I	40°F to 440°F	No	No	No	1E	Indicator (2 ch.)	EPIC	EPIC	
A8	Suppression Chamber Pressure	R.G. 1.97	1	I	0-110% design press.	Cat. 1	Cat. 1	Yes	1E	Continuous & 1 ch. recorded	-	-	New Instrument Required Refer to Para 4.4
		NYPA	1	I	None	-	-	-	-	None	-	-	

J.A. FITZPATRICK NUCLEAR POWER PLANT
REGULATORY GUIDE 1.97, REVISION 2 ASSESSMENT
POSITION SUMMARY TABLES

ITEM	VARIABLE		CAT.	QA	INSTRUMENT RANGE	ENV. QUAL.	SEIS. QUAL.	REDUNDANT	POWER SUPPLY	CONTROL ROOM INDICATION	TSC	EOF	COMMENTS
A9	RHR Service Water System Flow	R.G. 1.97	1	I	0-110% design flow	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Meets the intent of R.G. 1.97
		NYPA	1	I	0-100% design flow	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	
A10	Containment Hydrogen Concentration	R.G. 1.97	1	I	0-30% H2	Cat. 1	Cat. 1	Yes	IE	Continous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-30% H2	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	
A11	Containment Oxygen Concentration	R.G. 1.97	1	I	0-10% O2	No	No	Yes	IE	Continous & 1 ch. recorded	-	-	Qualified analyzers to be purchased Refer to Para. 4.5
		NYPA	1	I	0-30% O2	No	No	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	
A12	Core Spray System Flow	R.G. 1.97	1	I	0-110% design flow	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-151% design flow	Cat. 1	Cat. 1	YES	IE	Indicator (2 ch.)	EPIC	EPIC	

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A13	Core Spray System Pressure	R.G 1.97	1	I	0-110% design press	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-110% design press	Cat. 1	Cat. 1	YES	IE	Indicator (2 ch.)	EPIC	EPIC	
B1	Neutron Flux	R.G 1.97	1	I	10-6% to 100% power	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Refer to Para. 3.3
		NYPA	2	I	10-1 cps to 100% power	Cat. 2	Cat. 2	No	Non-IE	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
B2	Control Rod Position	R.G. 1.97	3	III	Full in not full in	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	3	III	Full in not full in	Cat. 3	Cat. 3	No	Non-IE	Continuous display	EPIC	EPIC	
B3	RCS Soluble Boron Concentration (Sample)	R.G. 1.97	3	III	0-1000 ppm	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Complies Refer to Para. 3.9
		NYPA	3	III	Lab analysis	Cat. 3	Cat. 3	No	Non-IE	Lab analysis	-	-	

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B4	Coolant Level in Reactor	R.G. 1.97	1	I	Bottom of Core to Main Steam Line	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Inadequate Range
		NYPA	1	I	-100 in. to +224.5 in.	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (1 ch.)	EPIC	EPIC	Refer to Para. 4.2
B5	BWR Core Thermocouples	-	-	-	-	-	-	-	-	-	-	-	Not requried per Supp. 1 to NUREG-0737
		-	-	-	-	-	-	-	-	-	-	-	
B6	RCS Pressure	R.G. 1.97	1	I	15 psia to 1500 psig	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-1500 psig	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	
B7	Drywell Pressure	R.G. 1.97	1	I	0-110% design pressure	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	-5 psig to +250 psig (0-520%)	Cat. 1	Cat. 1	Yes	IE	Indicator (4 ch.) Recorder (2 ch.)	EPIC	EPIC	

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B8	Drywell Sump Level	R.G. 1.97	1	I	Bottom to Top	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-100 ft.	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	Refer to Para. 3.4
B9	Primary Containment Pressure	R.G. 1.97	1	I	10 psia to 4 x design pressure	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	-5 psig to +250 psig 9.7 psia to 5.2 x design press.	Cat. 1	Cat. 1	Yes	IE	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
B10	Primary Containment Isolation Valve Position (Excluding Check Valves)	R.G. 1.97	1	I	Closed - Not Closed	Cat. 1	Cat. 1	Yes	IE	Continuous	-	-	Some valves not indicated in control room
		NYPA	1	I	Open-Closed	Cat. 1	Cat. 1	Yes	IE	Ind. Lts.	-	-	Refer to Para. 4.6
C1	Radioactivity Concentration or Radiation Level in Circulating Primary Coolant	R.G. 1.97	1	I	1/2 to 100 times Tech. Spec. Limit R/hr.	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	Vial Sample & 1-10^8 R/hr	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	Refer to Para. 3.8

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C2	Analysis of Primary Coolant (Gamma Spectrum)	R.G. 1.97	3	III	10 u Ci/gm to 10 Ci/gm	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	3	III	Lab analysis	Cat. 3	Cat. 3	No	Non-IE	Lab analysis	-	-	Refer to Para. 3.9
C3	BWR Core Thermocouples	-	-	-	-	-	-	-	-	-	-	-	Not required per Supp. 1 to NUREG-0737
		-	-	-	-	-	-	-	-	-	-	-	
C4	RCS Pressure	R.G. 1.97	1	I	15 psia to 1500 psig	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-1500 psig	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (2 ch.)	EPIC	-	
C5	Primary Containment Area Radiation	R.G. 1.97	3	-	1-105 R/hr	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	1	I	1-108 R/hr.	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	

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C6	Drywell Drain Sumps Level (Identified and Unidentified Leakage)	R.G. 1.97	1	I	Bottom to Top	Cat. 1	Cat. 1	Yes	1E	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-100 ft.	Cat. 1	Cat. 1	YES	1E	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	Refer to Para. 3.4
C7	Suppression Pool Water Level	R.G. 1.97	1	I	ECCS Suction to Normal +5 ft.	Cat. 1	Cat. 1	Yes	1E	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-30 ft.	Cat. 1	Cat. 1	Yes	1E	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	
C8	Drywell Pressure	R.G. 1.97	1	I	0-110% design pressure	Cat. 1	Cat. 1	Yes	1E	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	-5 psig to +250 psig	Cat. 1	Cat. 1	Yes	1E	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
C9	RCS Pressure	R.G. 1.97	1	I	15 psia to 1500 psig	Cat. 1	Cat. 1	Yes	1E	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-1500 psig	Cat. 1	Cat. 1	Yes	1E	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	

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C10	Primary Containment Pressure	R.G. 1.97	1	I	10 psia to 4 x design press	Cat. 1	Cat. 1	Yes	IE	Continuous or 1 ch. recorded	-	-	Complies
		NYPA	1	I	-5 psig to +250 psig	Cat. 1	Cat. 1	Yes	IE	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
C11	Containment and Drywell Hydrogen Concentration	R.G. 1.97	1	I	0-30% H2	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Complies
		NYPA	1	I	0-30% H2	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	Refer to Para. 3.8
C12	Containment and Drywell Oxygen Concentration (for inerted containments)	R.G. 1.97	1	I	0-10% O2	Cat. 1	Cat. 1	Yes	IE	Continuous & 1 ch. recorded	-	-	Refer to Para 4.5 Qualified analyzers to be purchased
		NYPA	1	I	0-10% O2	No	No	Yes	IE	Recorder (2 ch.)	EPIC	EPIC	
C13	Containment Effluent Radioactivity - Noble Gases (From identified release points including Standby Gas Treatment System Vent)	R.G. 1.97	3	III	10-6 to 10-2 u Ci/cc	Cat. 3	Cat. 3	No	Non-IE	Recorded	-	-	Complies
		NYPA	3	I & II	10-1 to 106 cps & 10-1 to 107 mR/hr	Cat. 3	Cat. 3	No	Non-IE	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	

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C14	Radiation Exposure Rate	-	-	-	-	-	-	-	-	-	-	-	Deleted RG-1.97, Rev. 3
		-	-	-	-	-	-	-	-	-	-	-	Refer to Para. 3.5
C15	Effluent Radioactivity - Noble Gases	R.G. 1.97	2	-	10-6 to 103 u Ci/cc	Cat. 2	Cat. 2	No	Non-IE	Recorded	-	-	Qualification in progress
		NYPA	2	I & II	10-1 to 106 cps & 10-1 to 107 mR/hr	No	No	No	UPS	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
D1	Main Feedwater Flow	R.G. 1.97	3	-	0-110% design pressure	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	3	-	0 - 12 x 106 lb/hr	Cat. 3	Cat. 3	No	UPS	Recorder	EPIC	EPIC	
D2	Condensate Storage Tank Level	R.G. 1.97	3	-	Bottom to Top	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	3	II	0-360 in.	No	Cat. 2	No	Non-IE	Indicator	EPIC	EPIC	

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D3	Suppression Chamber Spray Flow (RHR System Flow	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Low range flow indication to be installed Refer to Para. 4.7
		NYPA	2	II	0-250% design flow	Cat. 2	Cat. 2	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	
D4	Drywell Pressure	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	2	I	-5 psig to +250 psig	Cat. 1	Cat. 1	Yes	IE	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
D5	Suppression Pool Water Level	R.G. 1.97	2	-	ECCS Suction to Normal +5 ft.	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	2	II	0 - 30 ft.	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.) Recorder (2 ch.)	EPIC	EPIC	
D6	Suppression Pool Water Temperature	R.G. 1.97	2	-	30°F to 230°F	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Requires Qualification Refer to Para. 3.2
		NYPA	2	II	30°F to 230°F	No	No	No	UPS	On demand data logger	EPIC	EPIC	

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D7	Drywell Atmosphere Temperature	R.G. 1.97	2	-	40°F to 440°F	Cat. 2	Cat. 2	No	Non-1E	Continuous or on demand	-	-	Requires Qualification Refer to Para. 4.3
		NYPA	2	II	40°F to 440°F	No	No	No	UPS	Indicator (2 ch.)	EPIC	EPIC	
D8	Drywell Spray Flow (RHR Sys Flow)	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-1E	Continuous or on demand	-	-	Low range flow indication to be installed Refer to Para. 4.7
		NYPA	2	I	0-250% design flow	Cat. 1	Cat. 1	Yes	1E	Indicator (2 ch.)	EPIC	EPIC	
D9	Main Steamline Isolation Valves Leakage Control System Pressure	R.G. 1.97	2	-	0-15 in. wtr or 0-5 psid	Cat. 2	Cat. 2	NO	Non-1E	Continuous or on demand	-	-	Requires new instrumentation Refer to Para. 4.8
		NYPA	2	III	None	No	No	No	Non-1E	Alarm Only	-	-	
D10	Primary System Safety Relief Valve Positions	R.G. 1.97	2	II	Closed - Not Closed	Cat. 2	Cat. 2	No	Non-1E	Continuous or on demand	-	-	Qualification in progress
		NYPA	2	II	Closed - Not Closed	No	Cat. 2	No	UPS	On demand	EPIC	EPIC	

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D11	Isolation Condenser System Shell - Side Water Level	-	-	-	-	-	-	-	-	-	-	-	Not part of plant design
		-	-	-	-	-	-	-	-	-	-	-	
D12	Isolation Condenser System Valve Position	-	-	-	-	-	-	-	-	-	-	-	Not part of plant design
		-	-	-	-	-	-	-	-	-	-	-	
D13	RCIC Flow	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	2	I	0-125% design flow	Cat. 2	Cat. 2	No	UPS	Indicator	EPIC	EPIC	
D14	HPCI Flow	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	2	I	0-118% design flow	Cat. 2	Cat. 2	No	UPS	Indicator	EPIC	EPIC	

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D15	Core Spray System Flow	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	2	II	0-151% design flow	Cat. 1	Cat. 2	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	
D16	LPCI Flow (RHR Sys Flow)	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Meets the intent of R.G. 1.97
		NYPA	2	II	0-108% design flow	Cat. 1	Cat. 2	Yes	IE	Indicator (2 ch.) 1 ch. recorded	EPIC	EPIC	
D17	SLCS Flow	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Refer to Para. 3.6
		NYPA	-	-	None	-	-	-	-	None	-	-	
D18	SLCS Storage Tank Level	R.G. 1.97	2	-	Bottom to top	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Complies - awaiting ATWS Resolution
		NYPA	3	I	0-100%	No	Cat. 2	No	UPS	Indicator	EPIC	EPIC	

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D19	RHR System Flow	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Meets the intent of R.G. 1.97
		NYPA	2	II	0-108% design flow	Cat. 2	Cat. 2	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	
D20	RHR Heat Exchanger Outlet Temperature	R.G. 1.97	2	-	32°F to 350°F	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Qualfied sensors to be installed Refer to Para. 4.9
		NYPA	2	II	0°F to 600°F	No	Cat. 2	No	Non-IE	Recorder	EPIC	EPIC	
D21 A	Cooling Water Temperature to ESF System Components	R.G. 1.97	2	-	32°F to 200°F	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Requires new instrumentation Refer to Para. 4.10
		NYPA	-	-	None	-	-	-	-	None	-	-	
D21 B	RHR Service Water System Temperature	R.G. 1.97	2	-	32°F to 200°F	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Requires new instrumentation Refer to Para. 4.11
		NYPA	-	-	None	-	-	-	-	None	-	-	

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D22 A	Cooling Water Flow to ESF System Components	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Requires new instrumentation
		NYPA	-	-	None	-	-	-	-	None	-	-	
D22 B	RHR Service Water System Flow	R.G. 1.97	2	-	0-110% design flow	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Meets the intent of R.G. 1.97
		NYPA	2	II	0-100% design flow	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.)	EPIC	EPIC	
D23	High Radioactivity Liquid Tank Level	R.G. 1.97	3	-	Bottom to top	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Does not comply. Refer to Para. 3.7
		NYPA	3	III	Later	Later	Later	Later	Later	Local indicator and recorder	EPIC	EPIC	
D24	Emergency Ventilation Damper Position	R.G. 1.97	2	-	Open - Closed	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Some damper valves require position switches and qualification. Refer to Para. 4.15
		NYPA	2	II	Open - Closed	No	No	Yes/No	IE/ Non-IE	Ind. Lts.	-	-	

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D25	Status of Standby Power and Other Energy Sources Important to Safety	R.G. 1.97	2	II	Plant Specific	Cat. 2	Cat. 2	No	Non-IE	Continuous or on demand	-	-	Some bus voltages require control room indication. Refer to Para. 4.16
		NYPA	2	II	Various	Cat. 2	Cat. 2	Yes/No	IE/ Non-IE	Indicators	EPIC	EPIC	
E1	Primary Containment Area Radiation - High Range	R.G. 1.97	1	1	1-107 R/hr.	Cat. 1	Cat. 1	No	IE	Continuous and 1 ch. recorded			Refer to Para. 3.8
		NYPA	1	I	1-108 R/hr.	Cat. 1	Cat. 1	Yes	IE	Indicator (2 ch.)	EPIC	EPIC -	
E2	Reactor Building or Secondary Containment Area Radiation	R.G. 1.97	2	-	10-1-104 mR/hr.	Cat. 2	Cat. 2	No	Non-IE	Recorded	-	-	Refer to Para. 3.5
		NYPA	3	III	10-1-103 mR/hr.	Cat. 3	Cat. 3	No	Non-IE	Indicator & Recorder	-	-	
E3	Radiation Exposure Rate	R.G. 1.97	2	-	10-1-104 mR/hr	Cat. 2	Cat. 2	No	Non-IE	Recorded	-	-	Refer to Para. 3.5
		NYPA	-	-	-	-	-	-	-	-	-	-	

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E4	Noble Gases and Vent Flow Rate	R.G. 1.97	2	-	10-6 to 105 u Ci/cc 0-110% flow	Cat. 2	Cat. 2	No	Non-IE	Recorded	-	-	Qualification in progress. Vent flow rate instrument required Refer to Para. 4.13
		NYPA	3	III	10-1 to 106 cps 10-1 to 107 mR/hr. Flow - None	No	No	No	UPS	Indicator (4 ch.) Recorder (4 ch.)	EPIC	EPIC	
E5	Particulates and Halogens	R.G. 1.97	3	-	10-6 to 102 u Ci/cc	Cat. 3	Cat. 3	No	Non-IE	On demand	-	-	Complies
		NYPA	3	III	1-106 cpm	Cat. 3	Cat. 3	No	Non-IE	Local indicator	-	-	
E6	Radiation Exposure Meters	-	-	-	-	-	-	-	-	-	-	-	Not required per Supp. 1 to NUREG-0737
		-	-	-	-	-	-	-	-	-	-	-	
E7	Airborne Radio-Halogens and Particulates	R.G. 1.97	3	-	10-9 to 10³ u Ci/cc	Cat. 3	Cat. 3	No	Non-IE	Continuous or on demand	-	-	Complies
		NYPA	3	III	Instruments can envelope range requirements	Cat. 3	Cat. 3	No	Non-IE	Air Sample	-	-	

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E8	Plant and Environs Radiation (portable instr.)	R.G. 1.97	3	-	10-3 to 104 rads/hr.	Cat. 3	Cat. 3	No	Non-1E	On demand	-	-	Complies
		NYPA	3	III	Instruments can envelope range requirements	Cat. 3	Cat. 3	No	Non-1E	Portable Equipment	-	-	
E9	Plant and Environs Radioactivity (portable instr.)	R.G. 1.97	3	-	Multichannel gamma-ray spectrometer	Cat. 3	Cat. 3	No	Non-1E	On demand	-	-	Complies
		NYPA	3	III	Multichannel gamma-ray spectrometer	Cat. 3	Cat. 3	No	Non-1E	Onsite & Offsite Laboratories	-	-	
E10	Wind Direction	R.G. 1.97	3	-	0 - 360°	Cat. 3	Cat. 3	No	Non-1E	Recorded	-	-	Complies
		NYPA	3	III	0 - 360°	Cat. 3	Cat. 3	No	Non-1E	Recorder (3 ch.)	Met. Sys.	Met. Sys.	
E11	Wind Speed	R.G. 1.97	3	-	0 - 67 mph	Cat. 3	Cat. 3	No	Non-1E	Recorded	-	-	Complies
		NYPA	3	III	0 - 100 mph	Cat. 3	Cat. 3	No	Non-1E	Recorder (3 ch.)	Met. Sys.	Met. Sys.	

J.A. FITZPATRICK NUCLEAR POWER PLANT
REGULATORY GUIDE 1.97, REVISION 2 ASSESSMENT
POSITION SUMMARY TABLES

ITEM	VARIABLE		CAT.	QA	INSTRUMENT RANGE	ENV. QUAL.	SEIS. QUAL.	REDUNDANT	POWER SUPPLY	CONTROL ROOM INDICATION	TSC	EOF	COMMENTS
E12	Estimation of Atmosphere Stability	R.G. 1.97	3	-	-9°F to 18°F	Cat. 3	Cat. 3	No	Non-IE	Recorded	-	-	Complies
		NYPA	3	III	-9°F to 18°F	Cat. 3	Cat. 3	No	Non-IE	Recorder	Met. Sys.	Met. Sys.	
E13	Primary Coolant and Sump Accident Sample	R.G. 1.97	3	-	Grab Sample	Cat. 3	Cat. 3	No	Non-IE	On demand	-	-	Dissolved H2 & O2 capability in progress. Refer to Para. 4.17
		NYPA	3	III	Grab Sample	Cat. 3	Cat. 3	No	Non-IE	Sample Analysis			
E14	Containment Air Accident Sample	R.G. 1.97	3	-	Grab Sample	Cat. 3	Cat. 3	No	Non-IE	On demand	-	-	Meets the intent of R.G. 1.97. Refer to Para. 3.9
		NYPA	3	III	Grab Sample	Cat. 3	Cat. 3	No	Non-IE	Sample Analysis			

7.0 References

1. NRC Generic Letter No. 83-33 dated December 17, 1982 includes Supplement No. 1 to NUREG-0737, "Requirements for Emergency Response Capability."

2. Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 2, December 1980.

3. 10CFR50, Appendix A, "Domestic Licensing of Production and Utilization Facilities" General Design Criteria 13, "Instrumentation and Control."

4. 10CFR50, Appendix A, "Domestic Licensing of Production and Utilization Facilities" General Design Criteria 19, "Control Room."

5. 10CFR50, Appendix A, "Domestic Licensing of Production and Utilization Facilities "General Design Criteria 64, "Monitoring RAdioactivity Releases."

6. ANSI/ANS-4.5 - 1980, "Criteria for Accident Monitoring Functions in Light-Water-Cooled Reactors."

7. INPO 83-049 (NUTAC) "Regulatory Guide 1.97 (Accident Monitoring Instrumentation) Implementation Guideline."

8. IEEE - 323 - 197[illegible], "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations."

9. IEEE - 323 - 1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations."

10. NUREG - 0588, "Interim Staff Position on environmental Qualification of Safety-Related Electrical Equipment Review" dated August 1979.

11. IEEE-344-1971 "Seismic Qualification of Class 1E Equipment for Nuclear Generating Stations, Recommended Practices for."

12. IEEE-344-1975 "Seismic Qualification of Class 1E Equipment for Nuclear Generating Stations, Recommended Practices for."

13. PASNY letter, dated May 20, 1983, regarding environmental qualification of electrical equipment - 10 CFR 50.49, (JPN-84-45).

14. Regulatory Guide 1.32, "Criteria for Safety - Related Electric Power Systems for Nuclear Power Plants, Revision 2.

15. BWR Owners Group Report, "Position on NRC Regulatory Guide 1.97, Revision 2," dated May 1982.

16. USNRC Regulatory Guide 1.97, Draft 1, Revision 3, dated December 3, 1982.

17. USNRC Inspection Report No. 83-03 regarding Emergency Preparedness Appraisal.

NEW YORK POWER AUTHORITY

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

ATTAHCMENT - 2

SCHEDULE FOR IMPLEMENTATIONS OF VARIOUS MODIFICATIONS TO MEET REGULATORY GUIDE 1.97, REV. 2

SCHEDULE FOR INSTALLATION OF REGULATORY GUIDE 1.97 VARIABLES AT JAMES A. FITZPATRICK NUCLEAR POWER PLANT

REGULATORY GUIDE 1.97, REV. 2				INSTALLATION COMPLETION
ITEM	MEASURED VARIALBE	TYPE	CAT.	DATE
1.	Coolant Level in Reactor Vessel	A,B	1	30 days after 1986 Refueling Outage (Reload 7/Cycle 8) or January 31, 1984, whichever is later.
2.	Suppression Pool Water Temperature	A,D	1,2	Same as Item No. 1.
3.	Drywell Atmosphere Temperature	A,D	1,2	Same as Item No. 1.
4.	Suppression Chamber Pressure	A,	1	Same As Item No. 1.
5.	Containment and Drywell Hydrogen Concentration	A,C	1	30 days after 1985 Refueling Outage (Reload 6/Cycle 7) or December 31, 1985, Whichever is later.
6.	Containment and Drywell Oxygen Concentration (for inerted containment plants).	A,C	1	Same as Item 5.
7.	Neutron Flux	B	1	30 days after 1987 Refueling Outage (Reload 8/Cycle 9) or December 31, 1987, whichever is later.
8.	Primary Containment Isolation Valve Position (excluding check valves)	B	1	Same as Item 7.
9.	Radioactivity Concentration or Radiation Level in Circulating Primary Coolant	C	1	Same as Item 1.
10.	Containment Effluent Radioactivity - Noble Gases (from identified release points including Standby Gas Treatment System Vent)	C	3	Same as Item 5.

SCHEDULE FOR INSTALLATION OF
REGULATORY GUIDE 1.97 VARIABLES
AT JAMES A. FITZPATRICK NUCLEAR POWER PLANT

REGULATORY GUIDE 1.97, REV. 2				INSTALLATION COMPLETION
ITEM	MEASURED VARIALBE	TYPE	CAT.	DATE
11.	Suppression Chamber Spray Flow	D	2	Same as Item 7.
12.	Main Steamline Isolation Valves' Leakage Control System Pressure			Same as Item 1.
13.	Primary System Safety Relief Valve Position, Including ADS or Flow Through or Pressure in Valve Lines	D	2	Same as Item 5.
14.	SLCS Flow	D	2	Schedule to be determined as required by ATWS Ruling.
15.	SLCS Storage Tank	D	2	Same as Item 14.
16.	RHR Heat Exchanger Outlet Temperature	D	2	Same as Item 1.
17.	Cooling Water Temperature to ESC System Components	D	2	Same as Item 7.
18.	Cooling Water Flow to ESF System Components	D	2	Same as Item 7.
19.	High Radioactivity Liquid Tank Level	D	3	Same as Item 1.
20.	Emergency Ventilation Damper Position	D	2	Same as Item 1.
21.	Vent Flow Rate	E	2	Same as Item 7.
22.	Status of Standby Power & Other Energy Sources Important to Safety	D	2	Same as Item 7.
23.	Primary Coolant and Sump Accident Sample	E	3	Same as Item 7.