Enclosure 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

MAY 04 1993

MEMORANDUM FOR: Boen-Dar Liaw, Deputy Director
Division of Engineering

FROM: Jack R. Strosnider, Jr., Chief
Materials and Chemical Engineering Branch
Division of Engineering

SUBJECT: WATTS BAR UNIT 1 TECHNICAL SPECIFICATIONS REVIEW

The Materials and Chemical Engineering Branch has reviewed the following sections in the proposed Watts Bar Unit 1 Technical Specifications:

1) 5.9.1.7 Pressure and Temperature Limits Report (PTLR),
2) 5.7.2.12 Steam Generator Tube Surveillance Program, and
3) TSR 3.4.5.2 Inservice Inspection for Reactor Coolant System.

Based on our reviews, we have concluded the following:

1) The proposed format for the PTLR is acceptable.

2) The proposed steam generator tube surveillance program is unacceptable. We believe that the applicant must follow the surveillance requirements in the Standard Technical Specifications (e.g., NUREG-0452). We have discussed our concern with Ronnie Lo and Robert Giardina of the Technical Specifications Branch. Ronnie Lo mentioned that the applicant will submit a revised steam generator tube inspection program in May 1993 and that we should review the revised program before we make our decision. This is an open item.

3) TSR 3.4.5.2 should be revised so that inservice inspection for the Reactor Coolant System is consistent with the overall plant inservice inspection program discussed in Section 5.7.2.10 of the proposed Technical Specifications. (see Enclosure)

Jack R. Strosnider, Jr., Chief
Materials and Chemical Engineering Branch
Division of Engineering

Enclosure: As stated

CONTACT: John Tsao, DE/EMCB

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3. AND D.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	----------NOTE---------- Only required to be performed in MODES 1 and 2. ---------- Verify closure time of each MSIV is ≤ 5.0 seconds on an actual or simulated actuation signal.	In accordance with the Inservice Testing Program or 18 months

18 months is not consistent with IST. These are usually tested each Cold S/D per IST.

[redacted]

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more MFRV bypass valves inoperable.	C.1 Restore bypass valve to OPERABLE status.	72 hours
D. One MFIV and MFRV in the same flow path inoperable.	D.1 Isolate affected flow path.	8 hours
E. One MFIV bypass valve and MFRV bypass valve in the same flow path inoperable.	E.1 Restore one MFIV bypass valve or MFRV bypass valve to OPERABLE status.	8 hours
F. Required Action and associated Completion Time not met.	F.1 Be in MODE 3. AND F.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the closure time of each MFIV, MFRV, and associated bypass valve is ≤ 6.5 seconds on an actual or simulated actuation signal.	In accordance with the Inservice ~~Testing Program~~ or 18 months

[redacted]

Not consistent with IST.

5.7 Procedures, Programs, and Manuals

5.7.2.8 Radiological Environmental Monitoring Program

This program is for monitoring the radiation and radionuclides in the environs of the plant. The program shall provide representative measurements of radioactivity in the highest potential exposure pathways and verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall be contained in the ODCM, shall conform to the guidance of 10 CFR 50, Appendix I, and shall include the following:

a. Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM;

b. A Land Use Census to ensure that changes in the use of areas at and beyond the site boundary are identified and that modifications to the monitoring program are made if required by the results of this census; and

c. Participation in an Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

5.7.2.9 Component Cyclic or Transient Limit

This program provides controls to track the FSAR, Section 5.2.1.5, cyclic and transient occurrences to ensure that components are maintained within the design limits.

5.7.2.10 Inservice Inspection Program

This program provides controls for inservice inspection of ASME Code Class 1, 2, and 3 components, including applicable supports. The program shall include the following:

a. Provisions that inservice inspection of ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a;

(continued)

5.7 Procedures, Programs, and Manuals

5.7.2.10 Inservice Inspection Program (continued)

c/b. The provisions of SR 3.0.2 are applicable to the frequencies for performing inservice inspection activities;

d/c. Inspection of each reactor coolant pump flywheel per the recommendations of Regulation Position c.4.b of Regulatory Guide 1.14, Revision 1, August 1975; and

e/d. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any TS.

5.7.2.11 Inservice Testing Program

This program provides controls for inservice testing of ASME Code Class 1, 2, and 3 components including applicable supports. The program shall include the following:

a. Provisions that inservice testing of ASME Code Class 1, 2, and 3 pumps, valves, and snubbers shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a;

c/b. Testing frequencies specified in Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as follows:

OK for pumps and valves.

ASME Boiler and Pressure Vessel Code and applicable Addenda terminology for inservice testing activities	Required Frequencies for performing inservice testing activities
Weekly	At least once per 7 days
Monthly	At least once per 31 days
Quarterly or every 3 months	At least once per 92 days
Semiannually or every 6 months	At least once per 184 days
Every 9 months	At least once per 276 days
Yearly or annually	At least once per 366 days
Biennially or every 2 years	At least once per 731 days

(continued)

Insert A to § 5.7.2.11 - Inservice Inspection Program

b. Provisions that inservice inspection of all safety-related snubbers shall be performed in accordance with the ASME Operations and Maintenance (OM) Code, as required by 10 CFR 50.55a. Safety-related snubbers include those installed on safety-related components and those installed on nonsafety-related components if their failure or the failure of the component on which they are installed will have an adverse effect on any safety-related system.

Insert B to § 5.7.2.12 - Inservice Testing Program

b. Provisions that inservice testing of all safety-related snubbers shall be performed in accordance with the ASME Operations and Maintenance (OM) Code, as required by 10 CFR 50.55a. Safety-related snubbers include those installed on safety-related components and those installed on nonsafety-related components if their failure or the failure of the component on which they are installed will have an adverse effect on any safety-related system.

5.7 Procedures, Programs, and Manuals

5.7.2.11 Inservice Testing Program (continued)

c. The provisions of SR 3.0.2 are applicable to the above required Frequencies for performing inservice testing activities;

d. The provisions of SR 3.0.3 are applicable to inservice testing activities; and

e. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any TS.

5.7.2.12 Steam Generator (SG) Tube Surveillance Program

Each SG shall be demonstrated OPERABLE by performance of an inservice inspection program. The program shall include the following:

a. SG tube sample size selection, sample size expansion, and inspection result classification criteria. Sample selection and testing shall be in accordance with Regulatory Guide 1.83, Revision 1, July 1975.

b. The establishment of SG tube inspection frequency dependent upon inspection result classification. Inspection frequency shall be in accordance with Regulatory Guide 1.83, Revision 1, July 1975.

c. SG tube plugging/repair limits. These limits shall be 40% of the nominal tube wall thickness consistent with Regulatory Guide 1.83, Revision 1, July 1975.

d. Specific definitions and limits for SG tube inservice inspection acceptance criteria consistent with Regulatory Guide 1.83, Revision 1, July 1975.

e. The minimum type testing to determine tube integrity.

The content and frequency of written reports shall be in accordance with Specification 5.9.2.

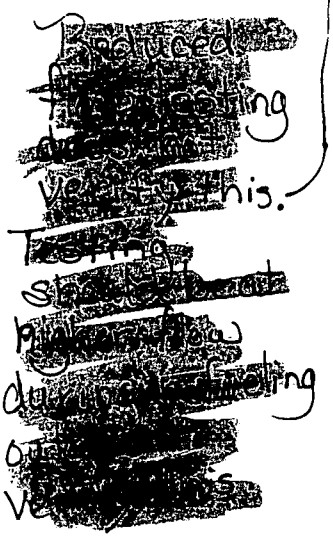
(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.5.2

This SR verifies that the AFW pumps develop sufficient discharge pressure to deliver the required flow at the lowest set pressure of the MSSVs plus 1% setpoint tolerance and 3% accumulation. Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is performed on recirculation flow. Periodically comparing the reference differential pressure developed at this reduced flow detects trends that might be indicative of incipient failure. Performance of inservice testing discussed in the ASME Code, Section XI (Ref. 2) (only required at 3 month intervals) satisfies this requirement. The 31 day Frequency on a STAGGERED TEST BASIS results in testing each pump once every 3 months, as required by Reference 2.



This SR is modified by a Note indicating that the SR should be deferred until suitable test conditions are established. This deferral is required because there is insufficient steam pressure to perform the test.

SR 3.7.5.3

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal in MODES 1, 2, and 3. In MODE 4, the required AFW train is already aligned and operating; therefore, this SR is not required. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency is acceptable based on operating experience and the design reliability of the equipment.

SR 3.7.5.4

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation signal in MODES 1, 2, and 3.

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.7 Inverters – Operating

LCO 3.8.7 Two inverters in each of four channels shall be OPERABLE.

---NOTE---
Two inverters may be disconnected from their associated DC bus for ≤ 24 hours to perform an ~~equalizing charge on their~~ associated common battery, provided:

a. The associated AC vital ~~buses~~ instrument boards (here and wherever else used) are energized from their associated 120 V AC ~~instrumentation~~ distribution panel; and

b. All other AC vital buses for both trains are energized from their associated OPERABLE inverters.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more inverters in one channel inoperable.	A.1	Power AC vital bus(es) from the associated 120 V AC instrumentation distribution panel.	2 hours
	AND		
	A.2	Restore inverter(s) to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours

BASES

BACKGROUND (continued)

automatic and permanently connected loads needed to recover the plant or maintain it in a safe condition are returned to service.

Ratings for Train 1A, 1B, 2A and 2B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 4400 kW with 10% overload permissible for up to 2 hours in any 24 hour period. The ESF loads that are powered from the 6.9 kV shutdown boards are listed in Reference 2.

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the FSAR, Section 6 (Ref. 4) and Section 15 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the Accident analyses and is based upon meeting the design basis of the plant. This results in maintaining at least two trains of onsite or one train of offsite AC sources OPERABLE during Accident conditions in the event of:

Two DG's in Same Train?

a. An assumed loss of all offsite power or all onsite AC power; and

b. A worst case single failure.

The AC sources satisfy Criterion 3 of NRC Policy Statement.

LCO

Two qualified circuits between the Watts Bar Hydro 161 kV switchyard and the onsite Class 1E Electrical Power System and separate and independent DGs for each train ensure availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an

(continued)

BASES

ACTIONS

A.3 (continued)

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition A was entered.

B.1

To ensure a highly reliable power source remains with one or more DGs inoperable in Train A or Train B, it is necessary to verify the availability of the offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems, such as the turbine driven auxiliary feedwater pump, are not included. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has inoperable DG(s).

The Completion Time for Required Action B.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable DG exists; and

(continued)

BASES

Include 4 DG DC sources

APPLICABILITY The vital DC electrical power sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure safe plant operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC electrical power requirements for MODES 5 and 6 are addressed in the Bases for LCO 3.8.5, "DC Sources – Shutdown."

ACTIONS A.1

Condition A represents one vital channel with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is, therefore, imperative that the operator's attention focus on stabilizing the plant, minimizing the potential for complete loss of DC power to the affected train. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution system train.

If one of the required vital DC electrical power subsystems is inoperable (e.g., inoperable battery, inoperable battery charger(s), or inoperable battery charger and associated inoperable battery), the remaining vital DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure of the OPERABLE subsystem would, however, result in a situation where the ability of the 125V DC electrical power subsystem to support its required ESF function is not assured, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 8) and reflects a reasonable time to assess plant status as a function of the inoperable vital DC electrical power subsystem and, if the vital DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe plant shutdown.

(continued)

BASES

ACTIONS (continued)

B.1

Define like STS

Condition B applies when more than one ~~channel~~ on a single bus is inoperable.

Required Action B.1 requires restoring all but one channel to OPERABLE status. The 1 hour Completion Time should allow ample time to repair most failures and takes into account the low probability of an event requiring an LOP start occurring during this interval.

C.1

Condition C applies to each of the LOP DG start Functions when the Required Action and associated Completion Time for Condition A or B are not met.

In these circumstances the Conditions specified in LCO 3.8.1, "AC Sources – Operating," or LCO 3.8.2, "AC Sources – Shutdown," for the DG made inoperable by failure of the LOP DG start instrumentation are required to be entered immediately. The actions of those LCOs provide for adequate compensatory actions to assure unit safety.

SURVEILLANCE REQUIREMENTS

A Note has been added to refer to Table 3.3.5-1 to determine which Surveillance Requirements apply for each LOP Function.

SR 3.3.5.1

31 ?

SR 3.3.5.1 is the performance of a TADOT. This test is performed every 92 days. The test checks operation of the undervoltage and degraded voltage relays that provide actuation signals. The Frequency is based on the known reliability of the relays and timers and the redundancy available, and has been shown to be acceptable through operating experience.

This SR has been modified by a Note that excludes verification of setpoints for relays/timers. Relay/timer setpoints require elaborate bench calibration and are verified during a CHANNEL CALIBRATION.

(continued)

BASES

TECHNICAL SURVEILLANCE REQUIREMENTS (continued)

TSR 3.8.1.3

This surveillance requires the inspection of each circuit breaker and the performance of procedures prepared in conjunction with the manufacturer's recommendations. By performance of recommended maintenance, the likelihood for the circuit breakers to become inoperable can be minimized. The 60 month Frequency takes into consideration the low frequency of operation of the circuit breakers and the low likelihood that operation and maintenance activities at the plant could adversely affect the OPERABILITY of the circuit breaker.

REFERENCES

1. Watts Bar FSAR, Section 6.0, "Engineered Safety Feature," and Section 15.0, "Accident Analyses."

2. WCAP-13470, "Watts Bar Unit 1 Technical Specifications Criteria Application Report," dated August, 1992.

3. Watts Bar Wiring Diagram Series 45B710-1, "Periodic Breaker Test."

4. Watts Bar Wiring Diagram Series 45B710-2, "Periodic Breaker Test."

5. NUREG-0847, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Units 1 and 2" including Supplements 13 dated January, 1985. thereto.

BASES

TECHNICAL SURVEILLANCE REQUIREMENTS (continued)

Requirements 3.8.2.1 and 3.8.2.3. This integrated functional test therefore needs only to be performed on each ~~unique type of~~ breaker. However, the surveillance has been modified by a Note stating that if a failure is discovered in the integrated functional test, an additional representative sample of at least 10% of all the circuit breakers of the inoperable type shall also be tested to assure that there is no common cause failure mechanism that could systematically affect all breakers of a given type.

The Frequency of 18 months coincides with the typical industry refueling cycle.

TSR 3.8.2.3

This surveillance requires that a sample of ≥ 10% of each type of electrically-operated circuit breaker be functionally tested. This is a large enough sample to provide confidence that any failure mechanism that systematically affects circuit breakers of a given type will be detected. The surveillance is modified by a Note 1 stating that the breakers selected for testing shall be chosen on a rotating basis.. This assures that all breakers are tested within several testing periods. Notes 2 and 3 describe the type of functional test to be performed and provide guidance concerning what to do when the an inoperable breaker is identified. Note 4 states that if the initial sample of ≥ 10% includes an inoperable circuit breaker, then an additional sample of ≥ 10% of the defective type must be tested to assure that the identified defect is not a common cause failure affecting other circuit breakers of the same type.

The Frequency of 18 months coincides with the typical industry refueling cycle.

TR 3.8.2.4

This surveillance requires the inspection of each circuit breaker and the performance of preventive maintenance in accordance with procedures prepared in conjunction with the manufacturers recommendation. Performance of recommended preventive maintenance helps ensure the operability of the circuit breakers. The 60 month Frequency takes into consideration known failure rates for the circuit breakers and operating experience.

(continued)

Enclosure 2

ELECTRICAL ENGINEERING BRANCH
REVIEW OF PROOF AND REVIEW COPY OF TECHNICAL SPECIFICATIONS
AND
TECHNICAL REQUIREMENTS MANUAL
WATTS BAR UNIT 1

TECHNICAL SPECIFICATIONS:

1. On page 3.8-8, SR 3.8.1.8 requires verification of the manual transfer from the normal offsite source to the alternate sources. This should be rewritten to encompass the latest design which includes automatic transfer between the two preferred offsite sources. Surveillance should be required for the automatic transfer circuitry (see SER Section 8.2.2.2.2) and the new tap changers which were installed on the transformers for the preferred offsite sources and which ensure adequate voltage is available.

2. On pages 3.8-23 and 3.8.28, Note 1 states that the fifth battery may be substituted for any of the other four batteries with no restriction. This is inconsistent with FSAR page 8.3-53 which states that the fifth battery "is intended to serve as a temporary replacement for any one of the four 125 vdc vital batteries during their testing, maintenance, and outages."

3. On page 3.8-26, SR 3.8.4.11 requires verification that each vital battery charger supplies a specific current for a specified duration. This surveillance and the surveillances required by SR 3.8.4.12 and SR 3.8.4.13 should be expanded to encompass the DG batteries also.

4. On page 3.8-40, SR 3.8.9.1 requires verification of correct breaker alignment and voltage for the AC and DC distribution subsystems. It is not clear whether this surveillance encompasses the positions of alternate feeder breakers as discussed in SER Section 8.3.1.7.1.

5. On page B 3.8-59, reference is made to Reference 10 for the design duty cycle requirements for batteries. This reference contains several design duty cycle requirements for the vital batteries and no requirements for the DG batteries. [redacted] A reference for the design duty cycle for the DG batteries should be provided.

6. On page B 3.8.81, a discussion of the power sources for the 6.9 kV shutdown boards is provided. This section should be rewritten to encompass the recently installed automatic transfer between preferred offsite sources.

7. On page 3.3-48, the note for SR 3.3.5.1 states that setpoint verification of the LOP DG [redacted] treated as [redacted]. The justification provided by the applicant for not doing this verification (see page B 3.3-[redacted]) is based on the elaborate test [redacted] required. While [redacted] may be true, [redacted] justification for postponing [redacted] verification of the undervoltage and degraded voltage relays from monthly to once each refueling outage is needed.

8. On page 3.3-49, the setpoints are listed for the LOP DG Start Instrumentation. The values listed do not agree with those contained in Watts Bar Calculation WBPE2119202001. Also the setpoints in that calculation have different values depending upon the mode of plant operation. The values for the "allowable values" are shown as "TBD." These numbers should be provided and a better discussion, related to the referenced calculation, should be provided in the BACKGROUND on page B 3.3-142 of the BASES.

9. On page 3.3-36 setpoints and surveillance requirements are listed for the loss of offsite power function under 6.d. The required number of channels and time delay values are incorrect. [redacted] setpoint verification is shown as not required for the monthly surve[redacted] Since these functions are provided by the same relays that perform the LOP DG Start function, any entree for surveillance, setpoint, LCO, etc. should be identical to those contained in Technical Specification 3.3.5 (Also see comments 7 and 8 above.).

TECHNICAL REQUIREMENTS MANUAL:

1. TR 3.8.3 contains the requirements for motor-operated valve thermal overload bypass devices. This section should also address the requirements for the thermal overloads which are not bypassed as was required by the older versions of standard technical specifications.

2. On page 3.3-9 under TR 3.3.2, the required response time for the Loss of Voltage/Degraded Voltage is listed as less than or equal to 11 seconds. This appears to be very tight for this circuitry.

3. On page 3.8-17 TSR 3.8.4.2 requires verification that components are de-energized by a simulated accident signal. This section should also include verification that de-energized components remain in the de-energized state when the accident signal is reset as was required by older versions of the standard technical specifications (see SER Section 8.3.3.1.1).

5.9 Reporting Requirements

5.9.1.3 Annual Radiological Environmental Operating Report (continued)

The Annual Radiological Environmental Operating Report covering the operation of the unit during the previous calendar year shall be submitted by May 15 of each year. The report shall include summaries, interpretations, and analyses of trends of the results of the Radiological Environmental Monitoring Program for the reporting period. The material provided shall be consistent with the objectives outlined in the Offsite Dose Calculation Manual (ODCM), and in 10 CFR 50, Appendix I, Sections IV.B.2, IV.B.3, and IV.C.

The Annual Radiological Environmental Operating Report shall include the results of analyses of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the table and figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements [in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979]. The report shall identify the TLD results that represent collocated dosimeters in relation to the NRC TLD program and the exposure period associated with each result. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted in a supplementary report as soon as possible.

5.9.1.4 Radioactive Effluent Release Report

---NOTE---
A single submittal may be made for a multiple unit station. The submittal should combine sections common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

The Radioactive Effluent Release Report covering the operation of the unit during the previous [redacted] shall be submitted [redacted] of each year in accordance with 10 CFR 50.36a. The report shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit. The material provided shall be

[redacted]

(continued)

[redacted]

As provided in paragraph 20.1601(c) of 10 CFR Part 20, the following controls shall be applied to high radiation areas in place of the controls required by paragraphS 20.1601 (a) and (b) of 10 CFR Part 20:

6.11.1 High Radiation Areas with Dose Rates not Exceeding 1.0 rem/hour:*

A. Each entryway to such an area shall be barricaded and conspicuously posted as a high radiation area. Such barricades may be breached only during periods of personnel entry or exit.

B. Access to, and activities in, each such area shall be controlled by means of a Radiation Work Permit (RWP) or equivalent that includes specification of radiation dose rates in the immediate work area(s) and other appropriate radiation protection equipment and measures.

C. Individuals qualified in radiation protection procedures (e.g., health physics technicians) and personnel continuously escorted by such individuals may be exempted from the requirement for an RWP or equivalent while performing their assigned duties provided that they are following plant radiation protection procedures for entry to, exit from, and work in such areas.

D. Each individual (whether alone or in a group) entering such an area shall possess:

(i) A radiation monitoring device that continuously displays radiation dose rates in the area ("radiation monitoring and indicating device"); or

(ii) A radiation monitoring device that continuously integrates the radiation dose rates in the area and alarms when the device's dose alarm setpoint is reached ("alarming dosimeter"), with an appropriate alarm setpoint, or

(iii) A radiation monitoring device that continuously transmits dose rate and cumulative dose to a remote receiver monitored by radiation protection personnel responsible for controlling personnel radiation exposure within the area, or

(iv) A self-reading dosimeter and,

(a) Be under the surveillance, as specified in the RWP, while in the area, of an individual at the work site, qualified in radiation

protection procedures, equipped with a radiation monitoring and indicating device who is responsible for controlling personnel radiation exposure within the area, or

(b) Be under the surveillance, as specified in the RWP, while in the area, by means of closed circuit television, of personnel qualified in radiation protection procedures, responsible for controlling personnel radiation exposure in the area.

E. Entry into such areas shall be made only after dose rates in the area have been determined and entry personnel are knowledgeable of them.

6.11.2 High Radiation Areas with Dose Rates Greater than 1.0 rem/hour, * but less than 500 rads/hour:**

A. Each entryway to such an area shall be conspicuously posted as a high radiation area and shall be provided with a locked door or gate that prevents unauthorized entry, and in addition:

(i) All such door and gate keys shall be maintained under the administrative control of the shift foreman or the health physics supervisor on duty.

(ii) Doors and gates shall remain locked except during periods of personnel entry or exit.

B. Access to, and activities in, each such area shall be controlled by means of an RWP or equivalent that includes specification of radiation dose rates in the immediate work area(s) and other appropriate radiation protection equipment and measures.

C. Individuals qualified in radiation protection procedures may be exempted from the requirement for an RWP or equivalent while performing radiation surveys in such areas provided that they are following plant radiation protection procedures for entry to, exit from, and work in such areas.

D. Each individual (whether alone or in a group) entering such an area shall possess:

(i) An alarming dosimeter with an appropriate alarm setpoint, or

(ii) A radiation monitoring device that continuously transmits dose rate and cumulative dose to a remote receiver monitored by radiation protection personnel responsible for controlling personnel

radiation exposure within the area with the means to communicate with and control every individual in the area, or

(ii) A self-reading dosimeter and,

(a) Be under the surveillance, as specified in the RWP or equivalent, of an individual qualified in radiation protection procedures, equipped with a radiation monitoring and indicating device who is responsible for controlling personnel exposure within the area, or

(b) Be under the surveillance, as specified in the RWP or equivalent, by means of closed circuit television, of personnel qualified in radiation protection procedures, responsible for controlling personnel radiation exposure in the area, and with the means to communicate with and control every individual in the area.

E. Entry into such areas shall be made only after dose rates in the area have been determined and entry personnel are knowledgeable of them.

F. Such individual areas that are within a larger area that is controlled as a high radiation area, where no enclosure exists for purpose of locking and where no enclosure can reasonably be constructed around the individual area need not be controlled by a locked door or gate, but shall be barricaded, conspicuously posted as a high radiation area, and marked by a conspicuous flashing light activated at the area as a warning device which is clearly visible from all access points to the area..

*At 30 centimeters (12 inches) from the radiation source or from any surface penetrated by the radiation.

**At 1 meter from the radiation source or from any surface penetrated by the radiation.