The low pressure (1800 psig) and variable low pressure ($16.25T_{out}$ -7756) trip setpoint shown in Figure 2.3-1 have been established to maintain the DNB ratio greater than or equal to 1.3 for those design accidents that result in a pressure reduction. (2,3)

Due to the calibration and instrumentation errors the safety analysis used a variable low reactor coolant system pressure trip value of ($16.25T_{out}$-7796).

D. Coolant outlet temperature

The high reactor coolant outlet temperature trip setting limit (619 F) shown in Figure 2.3-1 has been established to prevent excessive core coolant temperatures in the operating range. Due to calibration and instrumentation errors, the safety analysis used a trip set point of 620 F.

E. Reactor building pressure

The high reactor building pressure trip setting limit (4 psig) provides positive assurance that a reactor trip will occur in the unlikely event of a steam line failure in the reactor building or a loss-of-coolant accident, even in the absence of a low reactor coolant system pressure trip.

F. Shutdown bypass

In order to provide for control rod drive tests, zero power physics testing, and startup procedures, there is provision for bypassing certain segments of the reactor protection system. The reactor protection system segments which can be bypassed are shown in Table 2.3-1. Two conditions are imposed when the bypass is used:

1. A nuclear overpower trip set point of $\leq$5.0 percent of rated power is automatically imposed during reactor shutdown.

2. A high reactor coolant system pressure trip set point of 1720 psig is automatically imposed.

The purpose of the 1720 psig high pressure trip set point is to prevent normal operation with part of the reactor protection system bypassed. This high pressure trip set point is lower than the normal low pressure trip set point so that the reactor must be tripped before the bypass is initiated. The overpower trip set point of $\leq$5.0 percent prevents any significant reactor power from being produced when performing the physics tests. Sufficient natural circulation (5) would be available to remove 5.0 percent of rated power if none of the reactor coolant pumps were operating.

Table 2.3-1

Reactor Protection System Trip Setting Limits

	Four Reactor Coolant Pumps Operating (Nominal Operating Power - 100%)	Three Reactor Coolant Pumps Operating (Nominal Operating Power - 75%)	One Reactor Coolant Pump Operating in Each Loop (Nominal Operating Power - 49%)	Shutdown Bypass
1. Nuclear power, % of rated, max	105.5	105.5	105.5	5.0 (3)
2. Nuclear power based on flow (2) and imbalance, % of rated, max	1.07 times flow minus reduction due to imbalance(s)	1.07 times flow minus reduction due to imbalance(s)	1.07 times flow minus reduction due to imbalance(s)	Bypassed
3. Nuclear power based on pump monitors, % of rated, max (4)	NA	NA	55%	Bypassed
4. High reactor coolant system pressure, psig, max	2355	2355	2355	1720 (3)
5. Low reactor coolant system pressure, psig, min	1800	1800	1800	Bypassed
6. Variable low reactor coolant system pressure, psig, min	$(16.25T_{out}-7756)$ (1)	$(16.25T_{out}-7756)$ (1)	$(16.25T_{out}-7756)$ (1)	Bypassed
7. Reactor coolant temp, F, max	619	619	619	619
8. High reactor building pressure, psig, max	4 (18.7 psia)	4 (18.7 psia)	4 (18.7 psia)	4 (18.7 psia)

(1) T_{out} is in degrees Fahrenheit (F).

(2) Reactor coolant system flow, %.

(3) Automatically set when other segments of the RPS (as specified) are bypassed.

(4) The pump monitors also produce a trip on: (a) loss of two reactor coolant pumps in one reactor coolant loop, and (b) loss of one or two reactor coolant pumps during two-pump operation.

(J) The engineered safety features valves associated with each of the above systems shall be operable or locked in the ES position.

3.3.2 In addition to 3.3.1 above, the following ECCS equipment shall be operable when the reactor coolant system is above 350 F and irradiated fuel is in the core:

(A) Two out of three high pressure injection (makeup) pumps shall be maintained operable, powered from independent essential busses, to provide redundant and independent flow paths.

(B) Engineered safety features valves associated with 3.3.2.a above shall be operable or locked in the ES position.

3.3.3 In addition to 3.3.1 and 3.3.2 above, the following ECCS equipment shall be operable when the reactor coolant system is above 800 psig.

(A) The two core flooding tanks shall each contain an indicated minimum of 13 $\pm$ 0.4 feet (1040 $\pm$ 30 ft) of borated water at 600 $\pm$ 25 psig.

(B) Core flooding tank boron concentration shall not be less than 2270 ppm boron.

(C) The electrically operated discharge valves from the core flood tanks shall be open and breakers locked open and tagged.

(D) One of the two pressure instrument channels and one of the two level instrument channels per core flood tank shall be operable.

3.3.4 The reactor shall not be made critical unless the following equipment in addition to 3.3.1, 3.3.2, and 3.3.3 above is operable.

(A) Two reactor building spray pumps and their associated spray nozzle headers and four reactor building emergency cooling fans and associated cooling units.

(B) The sodium thiosulfate tank shall contain an indicated 31 ft of 30 wt% solution sodium thiosulfate (37,500 lb). The sodium hydroxide tank shall contain an indicated 31 ft. of 20 wt% solution sodium hydroxide (20,500 lb.).

(C) All manual valves in the main discharge lines of the sodium thiosulfate and sodium hydroxide tanks shall be locked open.

(D) Engineered safety feature valves and interlocks associated with 3.3.1, 3.3.2, and 3.3.3 shall be operable or locked in the ES position.

3.3.5 Except as noted in 3.3.6 below, maintenance shall be allowed during power operation on any component(s) in the high pressure injection, low pressure injection, service water, reactor building spray, reactor building cooling, penetration room ventilation, and BWST level instrumentation systems which will not remove more than one train of each system from service. Components shall not be removed from service so that the affected system train is inoperable for more than 24 consecutive hours. If the system is not restored to meet the requirements of Specification 3.3.1, 3.3.2, 3.3.3, or 3.3.4 within 24 hours the reactor shall be placed in the hot shutdown condition within 12 hours. If the requirements of Specification 3.3.1, 3.3.2, 3.3.3, or 3.3.4 are not met within an additional 48 hours, the reactor shall be placed in the cold shutdown condition within 24 hours.

3.3.6 Exceptions to 3.3.5 shall be as follows:

(A) Both core flooding tanks shall be operational above 800 psig.

(B) Both motor-operated valves associated with the core flooding tanks shall be fully open above 800 psig.

(C) One of the two pressure instrument channels and one of the two level instrument channels per core flood tank shall be operable.

3.3.7 Prior to initiating maintenance on any of the components, the duplicate (redundant) component shall be tested or have been tested within 24 hours to assure operability.

Bases

The requirements of Specification 3.3.1 assure that below 350 F, adequate long term core cooling is provided. Two low pressure injection pumps are specified. However, only one is necessary to supply emergency coolant to the reactor in the event of a loss-of-coolant accident.

The post-accident reactor building cooling and long-term pressure reduction may be accomplished by four cooling units, by two spray units or by a combination of two cooling units and one spray unit. Post-accident iodine removal may be accomplished by one of the two spray system strings. The specified requirements assure that the required post-accident components are available for both reactor building cooling and iodine removal. Specification 3.3.1 assures that the required equipment is operational.

The borated water storage tank is used for three purposes:

(A) As a supply of borated water for accident conditions.

(B) As an alternate supply of borated water for reaching cold shutdown.(2)

(C) As a supply of borated water for flooding the fuel transfer canal during refueling operation.(3)

3. Except for physics tests or exercising control rods, the control rod withdrawal limits are specified on Figures 3.5.2-1A and 3.5.2-1B for four pump operation and on Figure 3.5.2-2 for three or two pump operation. If the control rod position limits are exceeded, corrective measures shall be taken immediately to achieve an acceptable control rod position. Acceptable control rod positions shall be attained within four hours.

4. Except for physics tests, power shall not be increased above the power level cutoff (see Figures 3.5.2-1) unless the xenon reactivity is within 10 percent of the equilibrium value for operation at rated power and asymptotically approaching stability.

3.5.2.6 Reactor Power Imbalance shall be monitored on a frequency not to exceed two hours during power operation above 40 percent rated power. Except for physics tests, imbalance shall be maintained within the envelope defined by Figure 3.5.2-3. If the imbalance is not within the envelope defined by Figure 3.5.2-3, corrective measures shall be taken to achieve an acceptable imbalance. If an acceptable imbalance is not achieved within four hours, reactor power shall be reduced until imbalance limits are met.

3.5.2.7 The control rod drive patch panels shall be locked at all times with limited access to be authorized by the superintendent.

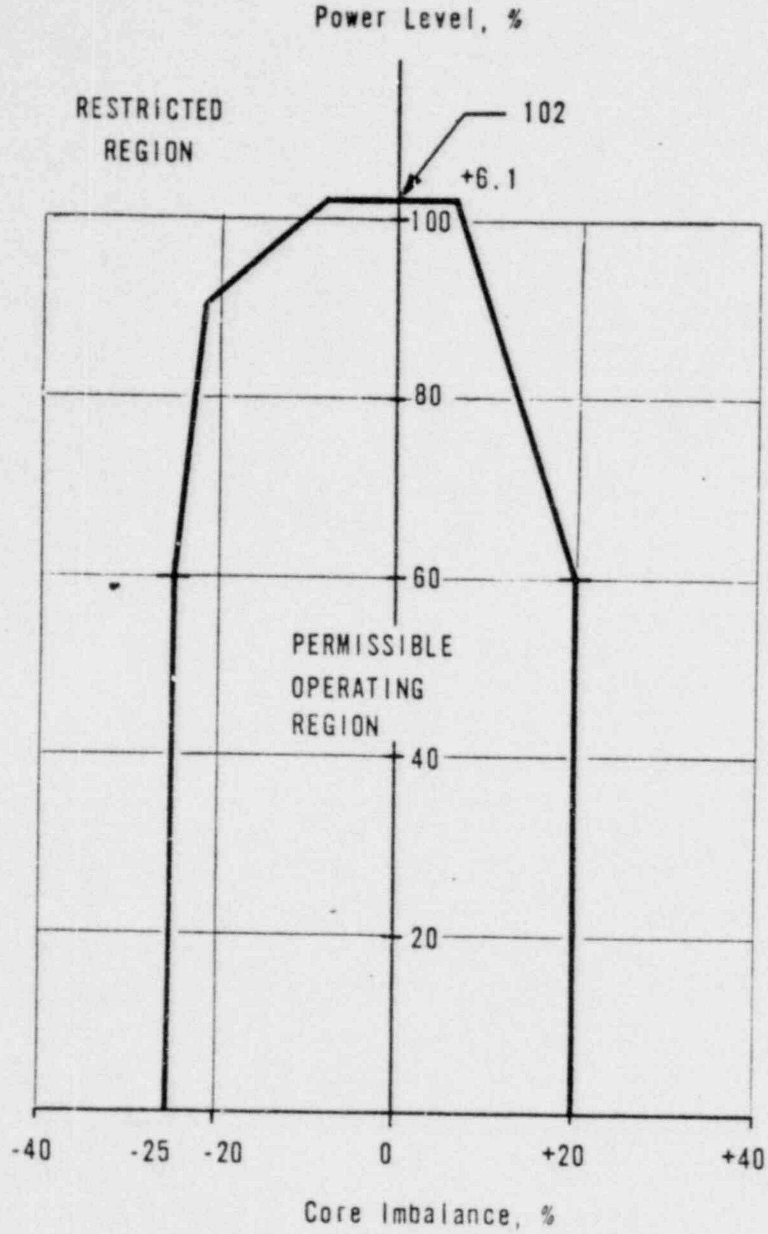
Bases

The power-imbalance envelope defined in Figure 3.5.2-3 is based on 1) LOCA analyses which have defined the maximum linear heat rate (see Figure 3.5.2-4) such that the maximum clad temperature will not exceed the Interim Acceptance Criteria and 2) the Protective System Maximum Allowable Setpoints (Figure 2.3-2). Corrective measures will be taken immediately should the indicated quadrant tilt, rod position, or imbalance be outside their specified boundary. Operation in a situation that would cause the interim acceptance criteria to be approached should a LOCA occur is highly improbable because all of the power distribution parameters (quadrant tilt, rod position, and imbalance) must be at their limits while simultaneously all other engineering and uncertainty factors are also at their limits.* Conservatism is introduced by application of:

a. Nuclear uncertainty factors
b. Thermal calibration
c. Fuel densification effects
d. Hot rod manufacturing tolerance factors

The 30 percent overlap between successive control rod groups is allowed since the worth of a rod is lower at the upper and lower part of the stroke. Control rods are arranged in groups or banks defined as follows:

*Actual operating limits depend on whether or not incore or excore detectors are used and their respective instrument and calibration errors. The method used to define the operating limits is defined in plant operating procedures.



ARKANSAS POWER & LIGHT CO ARKANSAS NUCLEAR ONE-UNIT 1	OPERATIONAL POWER IMBALANCE ENVELOPE	FIG.NO. 3.5.2-3

Other channels are subject only to "drift" errors induced within the instrumentation itself and, consequently, can tolerate longer intervals between calibrations. Process system instrumentation errors induced by drift can be expected to remain within acceptable tolerances if recalibration is performed at the intervals of each refueling period.

Substantial calibration shifts within a channel (essentially a channel failure) will be revealed during routine checking and testing procedures.

Thus, minimum calibration frequencies for the nuclear flux (power range) channels, and once each refueling period for the process system channels is considered acceptable.

Testing

On-line testing of reactor protective channels is required once every 4 weeks on a rotational or staggered basis. The rotation scheme is designed to reduce the probability of an undetected failure existing within the system and to minimize the likelihood of the same systematic test errors being introduced into each redundant channel.

The rotation schedule for the reactor protective channels is as follows:

Channels A, B, C, D	Before Startup if shutdown greater than 24 hours
Channel A	One Week After Startup
Channel B	Two Weeks After Startup
Channel C	Three Weeks After Startup
Channel D	Four Weeks After Startup

The reactor protective system instrumentation test cycle is continued with one channel's instrumentation tested each week. Upon detection of a failure that prevents trip action, all instrumentation associated with the protective channels will be tested after which the rotational test cycle is started again. If actuation of a safety channel occurs, assurance will be required that actuation was within the limiting safety system setting.

The protective channels coincidence logic and control rod drive trip breakers are trip tested every four weeks. The trip test checks all logic combinations and is to be performed on a rotational basis. The logic and breakers of the four protective channels shall be trip tested prior to startup and their individual channels trip tested on a cyclic basis. Discovery of a failure requires the testing of all channel logic and breakers, after which the trip test cycle is started again.

The equipment testing and system sampling frequencies specified in Table 4.1-2 and Table 4.1-3 is considered adequate to maintain the status of the equipment and systems to assure safe operation.

REFERENCE

FSAR Section 7.1.2.3.4

Table 4.1-1 (Cont'd)

Channel Description	Check	Test	Calibrate	Remarks
30. Decay Heat Removal System Isolation Valve Automatic Closure And Interlock System	S(1)(2)	M(1)(3)	R	(1) Includes RCS Pressure Analog Channel (2) Includes CFT Isolation Valve Position (3) Shall Also Be Tested During Refueling Shutdown Prior to Repressurization above 400 psig
31. Turbine Overspeed Trip Mechanism	N/A	R	N/A	
32. Steam Line Break Instrumentation And Control		(Later)		
33. Diesel Generator Protective Relaying, Starting Interlocks And Circuitry	M	Q	N/A	
34. Off-site Power Undervoltage And Protective Relaying Interlocks And Circuitry	W	R	R	
35. Borated Water Storage Tank Level Indicator	W	N/A	R	
36. Boric Acid Mix Tank				
a. Level Channel	N/A	N/A	R	
b. Temperature Channel	M	N/A	R	

Table 4.1-2

Minimum Equipment Test Frequency

Item	Test	Frequency
1. Control Rods	Rod Drop Times of All Full Length Rods 1/	Each Refueling Shutdown
2. Control Rod Movement	Movement of Each Rod	Every Two Weeks Above Cold Shutdown Conditions
3. Pressurizer Code Safety Valves	Setpoint	One Within 2 Weeks Prior to or Following Each Refueling Shutdown
4. Main Steam Safety Valves	Setpoint	Four Within 2 Weeks Prior to or Following Each Refueling Shutdown
5. Refueling System Interlocks	Functioning	Start of Each Refueling Shutdown
6. Reactor Coolant System Leakage	Evaluate	Daily
7. Charcoal and High Efficiency Filters in Control Room, Penetration Room Ventilation System, Hydrogen Purge System, and Reactor Purge System	Charcoal and HEPA Filter for Iodine and Particulate Removal Efficiencies. DOP Test on HEPA Filters. Freon Test on Charcoal Filter Units 2/	Each Refueling Period and at Any Time Work on Filters Could Alter Their Integrity
8. Reactor Building Isolation Trip	Functioning	Each Refueling Shutdown
9. Service Water Systems	Functioning	Each Refueling Shutdown
10. Spent Fuel Cooling System	Functioning	Each Refueling Shutdown Prior to Use
11. Decay Heat Removal System Isolation Valve Automatic Closure and Isolation System	Functioning	Each Refueling Shutdown Prior to Repressurization above 400 psig

1/ Same as tests listed in section 4.7
2/ Same as tests listed in sections 4.4.3, 4.5.3, 4.11 and 4.12

Table 4.1-3

MINIMUM SAMPLING FREQUENCY

Item	Check	Frequency
1. Reactor Coolant	a. Gamma Isotopic Analysis	a. Monthly
	b. Radiochemical Analysis for Sr 89, 90	b. Monthly
	c. Tritium	c. Monthly
	d. Gross Beta Activity (1, 4)	d. 5 times/week
	e. Chemistry (Cl, F, and O_2)	e. 5 times/week (5)
	f. Boron Concentration	f. 2 times/week
	g. Gross Alpha Activity	g. Monthly
	h. $\overline{E}$ Determination (2)	h. Semi-annually
2. Borated Water Storage Tank Water Sample	Boron Concentration	Weekly and after each makeup
3. Core Flooding Tank	Boron Concentration	Monthly and after each makeup
4. Spent Fuel Pool Water Sample	Boron Concentration	Monthly and after each makeup (6)
5. Secondary Coolant	a. Gross Beta Activity (4)	a. Weekly (7)
	b. Iodine Analysis (3)	
6. Sodium Hydroxide Tank	Sodium Hydroxide Concentration	Quarterly and after each makeup
7. Sodium Thiosulfate Tank	Sodium Thiosulfate Concentration	Quarterly and after each makeup

Table 4.1-3

MINIMUM SAMPLING FREQUENCY

(1) When radioactivity level is greater than 10 percent of the limits of specification 3.1.4, the sampling frequency shall be increased to a minimum of once each day.

(2) $\overline{E}$ determination will be started when gross beta (4) activity analysis indicates greater than 10 μCi/ml and will be redetermined each 10 μCi/ml increase in gross beta (4) activity analysis. A radiochemical analysis for this purpose shall consist of a quantitative measurement of 95% of radionuclides in reactor coolant with half lives of 30 minutes or greater. This is expected to consist of gamma isotopic analysis of dissolved and gaseous activities, radiochemical analysis for Sr 89, 90, and tritium analysis.

(3) When gross activity increases by a factor of two above background, an iodine analysis will be made and performed thereafter when the gross beta (4) activity increases by 10 percent.

(4) Gross β exclusive of H_3.

(5) O_2 analysis is not required when system is at or below cold shutdown conditions.

(6) Required only when fuel is in the pool and prior to transferring fuel to the pool.

(7) Weekly only when generating steam in the steam generators.

4.4.1.2.5 Test Frequency

Local leak detection tests shall be performed at a frequency of at least each refueling period, but in no case at intervals greater than two years except that:

(a) The equipment hatch and fuel transfer tube seals shall be additionally tested after each opening.

(b) The personnel hatch and emergency hatch outer door seals shall be tested after each opening when reactor building integrity is required but no more frequently than daily during normal operation or weekly during refueling or cold shutdowns. In addition, a pressure test shall be performed on the personnel and emergency hatches every six months.

4.4.1.3 Reactor Building Modifications

Any major modification or replacement of components affecting the reactor building integrity shall be followed by either an integrated leak rate test or a local leak test, as appropriate, and shall meet the acceptance criteria specified in 4.3.1.1 and 4.3.1.2 respectively.

4.4.1.4 Isolation Valve Functional Tests

Every three months, remotely operated reactor building isolation valves shall be stroked to the position required to fulfill their safety function unless such operation is not practical during plant operation. The latter valves shall be tested during each refueling period.

4.4.1.5 Visual Inspection

A visual examination of the accessible interior and exterior surfaces of the reactor building structure and its components shall be performed during each refueling shutdown and prior to any integrated leak test, to uncover any evidence of deterioration which may affect either the reactor building's structural integrity or leak-tightness. The discovery of any significant deterioration shall be accompanied by corrective actions in accord with acceptable procedures, nondestructive tests, and inspections, and local testing where practical prior to the conduct of any integrated leak test. Such repairs shall be reported as part of the test results.

Bases (1)

The reactor building is designed for an internal pressure of 59 psig and a steam-air mixture temperature of 285 F. Prior to initial operation, the reactor building will be strength tested at 115% of design pressure and leak rate tested at the design pressure. The reactor building will also be leak tested prior to initial operation at not less than 50% of

4.6.2 Station Batteries and Switchyard Batteries

1. The voltage, temperature and specific gravity of a pilot cell in each bank and the overall battery voltage of each bank shall be measured and recorded daily.

2. Measurements shall be made quarterly of voltage of each cell to the nearest 0.01 volt of the specific gravity of each cell, and of the temperature of every fifth cell in each bank. The level of the electrolyte shall be checked and adjusted as required. All data, including the amount of water added to any cell, shall be recorded.

3. During each refueling outage, a performance discharge test shall be conducted in accordance with the manufacturer's instructions, for the purpose of determining battery capacity.

4. Any battery charger which has not been loaded while connected to its 125V d-c distribution system for at least 30 minutes during every quarter shall be tested and loaded while connected to its bus for 30 minutes. The third battery charger, which is capable of being connected to either of the two 125V d-c distribution systems, shall be loaded while connected to each bus for at least 30 minutes every quarter.

4.6.3 Emergency Lighting

The correct functioning of the emergency lighting system shall be verified at least once each year.

TABLE 2-2

MINIMUM SAMPLING FREQUENCY

Item	Check	Frequency	Required Sensitivity of Waste Analysis in Lab[3]
1. Filtered Waste Monitor Tank, Treated Waste Monitor Tank, and Laundry Drain Tank	a. Gross Beta[6] Gamma isotopic analysis	a. Prior to release of each batch	a. 10^{-7} μCi/ml Gamma Nuclides 5×10^{-7} μCi/ml[4]
	b. Radiochemical Analysis Sr 89, 90	b. Monthly	b. 10^{-8} μCi/ml
	c. Dissolved Noble Gases	c. Monthly	c. Dissolved Gases 10^{-5} μCi/ml
	d. Tritium	d. Monthly Proportional Composite [2]	d. 10^{-5} μCi/ml
	e. Gross Alpha Activity	e. Monthly Proportional Composite	e. 10^{-7} μCi/ml
	f. Ba-La-140, I-131	f. Weekly Proportional Composite [2]	f. 10^{-6} μCi/ml
2. Waste Gas Decay Tank	a. Gamma Isotopic Analysis	a. Prior to release of each batch	a. 10^{-4} μCi/cc
	b. Gross Gamma Activity	b. Prior to release of each batch	b. 10^{-7} μCi/cc
	c. Tritium	c. Prior to release of each batch	c. 10^{-6} μCi/cc
3. Unit Vent Sampling	a. Iodine Spectrum[1]	a. Weekly	a. 10^{-11} μCi/cc

TABLE 2-2 (Cont'd)

MINIMUM SAMPLING FREQUENCY

Item	Check	Frequency	Required Sensitivity of Waste Analysis in Lab[3]
3. Unit Vent Sampling (Cont'd)	b. Particulates[3]		
	1) Gross Beta Activity[6]	1) Weekly	1) 10^{-11} µCi/cc
	2) Gross Alpha Activity	2) Quarterly on Weekly Sample	2) 10^{-11} µCi/cc
	3) Gamma Isotopic Analysis	3) Monthly Composite	3) 10^{-10} µCi/cc
	4) Radiochemical Analysis Sr 89, 90	4) Quarterly Composite	4) 10^{-11} µCi/cc
	5) Ba-La-140, I-131	5) Weekly	5) 10^{-10} µCi/cc
	c. Gases		
	1) Gamma Isotopic Analysis	1) Monthly[5]	1) 10^{-6} µCi/cc
	2) Tritium	2) Quarterly	2) 10^{-6} µCi/cc
4. Reactor Building Purge	a. Gamma Isotopic Analysis	a. Each Purge	a. 10^{-4} µCi/cc
	b. Gross Gamma Activity	b. Each Purge	b. 10^{-7} µCi/cc
	c. Tritium	c. Each Purge	c. 10^{-6} µCi/cc

TABLE 2-2 (Cont'd)

MINIMUM SAMPLING FREQUENCY

(1) When activity level exceeds 10 percent of the limits of Specification 2.4.2.3, the sampling frequency shall be increased to a minimum of once each day. When the gross activity release rate exceeds one percent of maximum release rate and the average gross activity release rate increases by 50 percent over the previous day, an analysis shall be performed for iodines and particulates.

(2) A proportional sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged from the plant.

(3) The detectability limits for activity analysis are based on the technical feasibility and on the potential significance in the environment of the quantities released. For some nuclides, lower detection limits may be readily achievable and when nuclides are measured below the stated limits, they should also be reported.

(4) For certain mixtures of gamma emitters, it may not be possible to measure radionuclides in concentrations near their sensitivity limits when other nuclides are present in the sample in much greater concentrations. Under these circumstances, it will be more appropriate to calculate the concentration of such radionuclides using observed ratios with those radionuclides which are measurable.

(5) Analyses shall also be performed during reactor coolant degassing operations when Waste Gas Decay Tanks are bypassed and waste gas from the vacuum degassifier is being discharged to the station vent without holding for decay.

(6) Gross β activity exclusive of H_3.

operational monitoring program described herein. The operational monitoring shall begin with the operation of Unit 1 and shall continue for five years after Unit 2 goes into operation. The effects of plant operation shall be determined by comparison of ecological parameters studied in the preoperational program.

Survey Plan

A map of the survey area showing sampling locations is presented in Figure 4-3. The type and frequency of field sampling shall be as presented in Table 4-3.

Specification

(a) Biological Surveys

1) Plankton

Plankton samples shall be obtained by use of the Wisconsin plankton net. These samples shall be analyzed for plankton (fauna, periphyton, filimentous algae) count and these counts will indicate numbers of organisms per liter of water sample as determined by the strip count method.

2) Benthic Organisms

The bottom organisms shall be obtained by the use of the Ekman dredge. The number of specimens of each group will be listed by sampling areas. Counts shall be made for the number of organisms per one-fourth square foot. Analysis of the plankton and benthic organisms will provide important information regarding the food chain.

3) Fish Survey

a) Gill Net Survey

A fish population and fish species count shall be taken with sizes noted, through the use of gill and trammel nets. A minimum of 16 net-nights' sampling will be accomplished each quarter. At each sampling point two (2) sets of 2 net-nights' sampling data will be obtained within 30 days on a quarterly basis. Spines, scale samples, and length/weight frequencies shall be obtained for representatives of each species.

4.2.10 Milk Sampling

Samples of milk shall be collected monthly from farms within a 10-mile radius of the plant. Samples shall be analyzed for Iodine-131, Strontium 89-90 and gamma emitting isotopes.

The area within five (5) miles of the plant shall be surveyed semi-annually for the locations of animals (cows, goats) producing milk for human consumption. The results of this survey shall be included in the Semiannual Operating Report required by Specification 5.6.1. These locations shall be included in the milk sampling program as soon as the necessary arrangements can be made. The sampling frequency for locations nearer than three (3) miles shall be every two weeks during the grazing season and locations nearer than 1.5 miles shall be sampled weekly during the grazing season. Each sample shall be analyzed for I-131 as in Table 4-1, and monthly composites shall be analyzed for radiostrontium and gamma emitters.

Bases:

Due to liquidation and/or sale of farms within the area of the Arkansas Nuclear One site, specific farms or herds, other than the Arkansas Tech herd, will not be noted in these Specifications. Rather, the area will be surveyed semiannually as per Specification 4.2.10 and specifically noted in the Semiannual Operating Report where relevant.

4.2.11 Vegetation Sampling

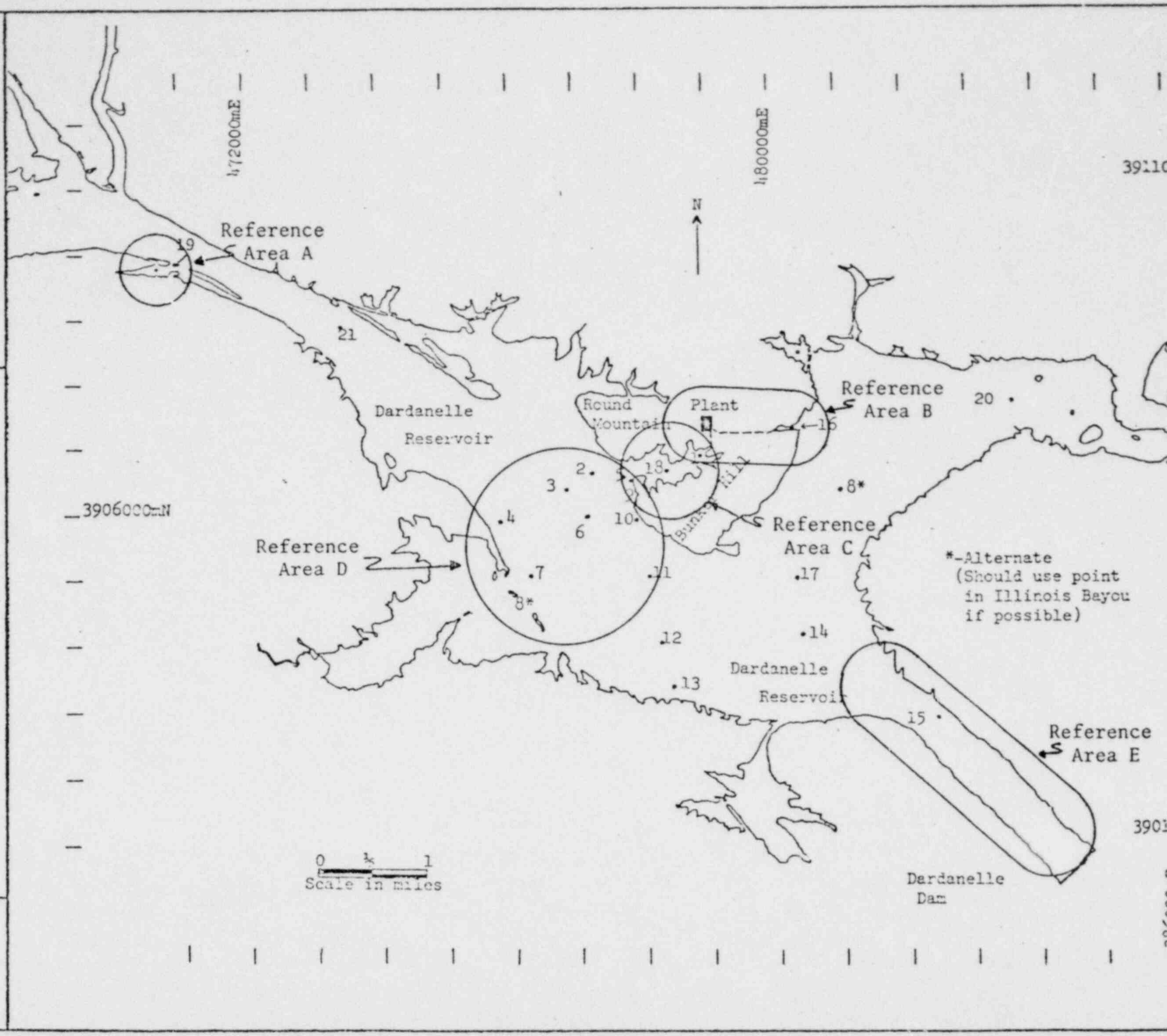
Grass and the leafy portions of other natural vegetation available at each of the air sampling stations shall be collected three times per year (spring, summer, and fall). Food crops and pasturage in the vicinity of the plant also shall be collected as available at harvest time. Appropriate analyses of all samples shall be performed in accordance with accepted techniques and nuclides of interest as given in Table 4-1.

4.2.12 Soil Sampling

Soil samples shall be collected semi-annually at the same locations as vegetation samples and analyzed for gross alpha and gross beta and gamma emitting isotopes as described in Table 4-1. The Fall sample also shall be analyzed for Strontium 89-90.

Bases:

One of the limiting conditions for operation of Arkansas Nuclear One is restricting environmental effects due to plant operation in unrestricted areas surrounding the plant site to within limits specified in AEC Regulations 10 CFR - Parts 20, 50, and 100. This Radiological Monitoring Program includes measurements made on the air, water, and land environments to insure that these limits are observed.



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ARKANSAS NUCLEAR ONE-UNIT 1

AQUATIC SAMPLING POINTS

FIG. NO. 4-3

TABLE 4-2

SAMPLE LOCATION AND SCHEDULE

Sample Station #	Direction and Distance from Plant	Sample Station Location	Sample Types	Sample Frequency	Remarks
16	295° - 6.0 miles	Piney Creek Area	1) Lake Water 2) Bottom Sediment 3) Aquatic Biota	1) Monthly 2) Semi-annually 3) Semi-annually	
17	Note 1		1) Milk 2) Pasturage	1) Monthly 2) 3 times/year	2) Spring, Summer, Fall
18	Note 1		1) Milk 2) Pasturage	1) Monthly 2) 3 times/year	2) Spring, Summer, Fall
19	99° - 5.0 miles	Arkansas-Tech. Herd	1) Milk 2) Pasturage	1) Monthly 2) 3 times/year	2) Spring, Summer, Fall

Note 1: These sample stations will be determined from farms within a 10-mile radius of the plant which produce milk as per Specification 4.2.10 and will be reported in the Semiannual Operating Report as per Specification 5.6.1.

TABLE 4-3

AQUATIC SAMPLING LOCATION AND FREQUENCIES

Sample Type	Sample Frequency	Sample Station #
Plankton	Quarterly - January, April July, October	1, 2, 3, 5, 10, 11, 14, 15, 16, 19, 21
Benthic Organisms	Quarterly - January, April July, October	1, 2, 3, 5, 10, 11, 14, 15, 16, 19, 21
Gill Net Survey	4 Consecutive Days Quarterly - January, April July, October	Areas A, B, C, D
Trawling Survey	Every other week March, April, May, June	Areas A, B, C, D
Trap Net Survey	5 Consecutive Days - Spring & Fall	Areas A, B, D
Cove Rotenone Survey	September	Areas A, C
Shoreline Seine Survey	Every other week March, April, May, June	Areas A, C
Fish Cage Survey (Mussels)	Semi-Annually	Areas A, B, D
Chemical	Monthly	3, 5, 7, 8, 10, 11, 13, 14, 15, 16, 17, 19
Physical	Monthly	3, 5, 7, 8, 10, 11, 13, 14, 15, 16, 17, 19