ATTACHMENT 2

PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 AND 3

Docket Nos. 50-277
50-278

License Nos. DPR-44
DPR-56

TECHNICAL SPECIFICATION CHANGE REQUEST
91-06

"Main Control Room Intake Air Radiation Monitors"
"Seismic Monitoring Instrumentation"

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LIMITING CONDITION FOR OPERATION

3.2.D. Radiation Monitoring Systems-Isolation and Initiation Functions

1. Reactor Building Isolation and Standby Gas Treatment System

The limiting conditions for operation are given in Table 3.2.D.

2. Main Control Room

The limiting conditions for operation are given in Table 3.2.D.

E. Drywell Leak Detection

The limiting conditions of operation for the instrumentation that monitors drywell leak detection are given in Section 3.6.C, "Coolant Leakage".

SURVEILLANCE REQUIREMENTS

4.2.D. Radiation Monitoring Systems-Isolation and Initiation Functions

1. Reactor Building Isolation and Standby Gas Treatment System

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.D.

System logic shall be functionally tested as indicated in Table 4.2.D.

2. Main Control Room

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.D.

E. Drywell Leak Detection

Instrumentation shall be calibrated and checked as indicated in table 4.2.E.

LIMITING CONDITION FOR OPERATION

3.2.D. Radiation Monitoring Systems-Isolation and Initiation Functions

1. Reactor Building Isolation and Standby Gas Treatment System

The limiting conditions for operation are given in Table 3.2.D.

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E. Drywell Leak Detection

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SURVEILLANCE REQUIREMENTS

4.2.D. Radiation Monitoring Systems-Isolation and Initiation Functions

1. Reactor Building Isolation and Standby Gas Treatment System

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.D.

System logic shall be functionally tested as indicated in Table 4.2.D.

2. Main Control Room

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.D.

E. Drywell Leak Detection

Instrumentation shall be calibrated and checked as indicated in table 4.2.E.

TABLE 3.2.D
RADIATION MONITORING SYSTEMS THAT INITIATE AND/OR ISCLATE SYSTEMS

Minimum No. of Operable Instrument Channels per Trip System (1)	Trip Function	Trip Level Setting	No. of Instrument Channels Provided by Design	Action (2)
2	Refuel Area Exhaust Monitor	Upscale, <16 mr/hr	4 Inst. Channels	A or B
2	Reactor Building Exhaust Monitors	Upscale, <16 mr/hr	4 Inst. Channels	B
1 (3)	Main Stack Monitor	Upscale, $\leq 10^6$ cps	2 Inst. Channels	C
2 (4)	Main Control Room	Upscale, <400 cpm	4 Inst. Channels	D

Notes for Table 3.2.D

1. Whenever the systems are required to be operable, the specified number of instrument channels shall be operable or placed in the tripped condition. If this cannot be met, the indicated action shall be taken.

2. Action

   A. Cease operation of the refueling equipment.
   B. Isolate secondary containment and start the standby gas treatment system.
   C. Cease purging of primary containment, and close vent and purge valves greater than 2 inches in diameter.
   D. As described in LCO 3.11.A.5

3. The trip function is required to be operable only when the containment is purging through the SGTS and containment integrity is required. If both radiation monitors are out of service, action shall be taken as indicated in Note 2, (C).

4. The trip function is required to be operable whenever secondary containment is required on either unit.

TABLE 3.2.D
RADIATION MONITORING SYSTEMS THAT INITIATE AND/OR ISOLATE SYSTEMS

Minimum No. of Operable Instrument Channels per Trip System (1)	Trip Function	Trip Level Setting	No. of Instrument Channels Provided by Design	Action (2)
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2	Reactor Building Exhaust Monitors	Upscale, <16 mr/hr	4 Inst. Channels	B
1 (3)	Main Stack Monitor	Upscale, $\leq 10^6$ cps	2 Inst. Channels	C
2 (4)	Main Control Room	Upscale, <400 cpm	4 Inst. Channels	D

Notes for Table 3.2.D

1. Whenever the systems are required to be operable, the specified number of instrument channels shall be operable or placed in the tripped condition. If this cannot be met, the indicated action shall be taken.

2. Action

   A. Cease operation of the refueling equipment.
   B. Isolate secondary containment and start the standby gas treatment system.
   C. Cease purging of primary containment, and close vent and purge valves greater than 2 inches in diameter.
   D. As described in LCO 3.11.A.5

3. The trip function is required to be operable only when the containment is purging through the SGTS and containment integrity is required. If both radiation monitors are out of service, action shall be taken as indicated in Note 2, (C).

4. The trip function is required to be operable whenever secondary containment is required on either unit.

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TABLE 4.2.D

MINIMUM TEST & CALIBRATION FREQUENCY FOR RADIATION MONITORING SYSTEMS

	Instrument Channels	Instrument Functional Test	Calibration	Instrument Check (2)
1)	Refuel Area Exhaust Monitors - Upscale	(1)	Once/3 months	Once/day
2)	Reactor Building Area	(1)	Once/3 months	Once/day
3)	Main Stack Monitor	Once/3 months	Once/12 months as described in 4.8.C.4.a	Once/day
4)	Main Control Room	Once/3 months	Once/18 months as described in 4.11.A.5	Once/day

	Logic System Functional Test (4) (6)	Frequency
1)	Reactor Building Isolation	Once/6 months
2)	Standby Gas Treatment System Actuation	Once/6 months

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TABLE 4.2.D

MINIMUM TEST & CALIBRATION FREQUENCY FOR RADIATION MONITORING SYSTEMS

	Instrument Channels	Instrument Functional Test	Calibration	Instrument Check (2)
1)	Refuel Area Exhaust Monitors - Upscale	(1)	Once/3 months	Once/day
2)	Reactor Building Area	(1)	Once/3 months	Once/day
3)	Main Stack Monitor	Once/3 months	Once/12 months as described in 4.8.C.4.a	Once/day
4)	Main Control Room	Once/3 months	Once/18 months as described in 4.11.A.5	Once/day

	Logic System Functional Test (4) (6)	Frequency
1)	Reactor Building Isolation	Once/6 months
2)	Standby Gas Treatment System Actuation	Once/6 months

3.2 BASES (Cont'd)

Four sets of two radiation monitors are provided which initiate the Reactor Building Isolation function and operation of the standby gas treatment system. Four instrument channels monitor the radiation from the refueling area ventilation exhaust ducts and four instrument channels monitor the building ventilation below the refueling floor. Each set of instrument channels is arranged in a 1 out of 2 twice trip logic.

Trip settings of less than 16 mr/hr for the monitors in the refueling area ventilation exhaust ducts are based upon initiating normal ventilation isolation and standby gas treatment system operation so that none of the activity released during the refueling accident leaves the Reactor Building via the normal ventilation path but rather all the activity is processed by the standby gas treatment system.

Two channels of nonsafety-related radiation monitors are provided in the main stack. Trip signals from these monitors are required only when purging the containment through the SGTS and containment integrity is required. The trip signals isolate primary containment vent and purge valves greater than 2 inches in diameter to prevent accidental releases of radioactivity offsite when the valves are open. This signal is added to fulfill the requirements of item II.E.4.2(7) of NUREG-0737.

Four channels of in-duct radiation monitors are provided which initiate the Main Control Room Emergency Ventilation System. Each set of instrument channels are arranged in a one (1) out of two (2) twice trip logic.

Flow integrators are used to record the integrated flow of liquid from the drywell sumps. The integrated flow is indicative of reactor coolant leakage. A Drywell Atmosphere Radioactivity Monitor is provided to give supporting information to that supplied by the reactor coolant leakage monitoring system. (See Bases for 3.6.C and 4.6.C)

Some of the surveillance instrumentation listed in Table 3.2.F are required to meet the accident monitoring requirements of NUREG-0737, Clarification of TMI Action Plan Requirements. The instrumentation and the applicable NUREG-0737 requirements are:

1. Wide range drywell pressure (II.F.1.4)
2. Subatmospheric drywell pressure (II.F.1.4)
3. Wide range suppression chamber water level (II.F.1.5)
4. Main stack high range radiation monitor (II.F.1.1)
5. Reactor building roof vent high range radiation monitor (II.F.1.1)
6. Drywell hydrogen concentration analyzer and monitor (II.F.1.6)
7. Drywell high range radiation monitors (II.F.1.3)
8. Reactor Water Level - wide and fuel range (II.F.2)
9. Safety-Relief Valve position indication (II.D.3)

3.2 BASES (Cont'd)

Four sets of two radiation monitors are provided which initiate the Reactor Building Isolation function and operation of the standby gas treatment system. Four instrument channels monitor the radiation from the refueling area ventilation exhaust ducts and four instrument channels monitor the building ventilation below the refueling floor. Each set of instrument channels is arranged in a 1 out of 2 twice trip logic.

Trip settings of less than 16 mr/hr for the monitors in the refueling area ventilation exhaust ducts are based upon initiating normal ventilation isolation and standby gas treatment system operation so that none of the activity released during the refueling accident leaves the Reactor Building via the normal ventilation path but rather all the activity is processed by the standby gas treatment system.

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4. Main stack high range radiation monitor (II.F.1.1)
5. Reactor building roof vent high range radiation monitor (II.F.1.1)
6. Drywell hydrogen concentration analyzer and monitor (II.F.1.6)
7. Drywell high range radiation monitors (II.F.1.3)
8. Reactor Water Level - wide and fuel range (II.F.2)
9. Safety-Relief Valve position indication (II.D.3)

4.2 BASES (cont'd)

The radiation monitors in the refueling area ventilation duct which initiate building isolation and standby gas treatment operation are arranged in a 1 out of 2 twice logic system. The bases given above for the rod blocks apply here also and were used to arrive at the functional testing frequency. The air ejector off-gas monitors are connected in a 2 out of 2 logic arrangement. Based on the experience with instruments of similar design, a testing interval of once every three months has been found adequate.

Radiation monitors in the main stack which initiate containment isolation are not safety-related and are required only during containment purging through the SGTS and when containment integrity is required, an activity which occurs infrequently. Therefore, a twelve (12) month calibration interval is appropriate.

The Control Room Intake Air Radiation Monitors are safety-related and are required to be operable at all times when secondary containment is required. The calibration interval is as described in Section 4.11.A.

The automatic pressure relief instrumentation can be considered to be a 1 out of 2 logic system and the discussion above applies also.

4.2 BASES (cont'd)

The radiation monitors in the refueling area ventilation duct which initiate building isolation and standby gas treatment operation are arranged in a 1 out of 2 twice logic system. The bases given above for the rod blocks apply here also and were used to arrive at the functional testing frequency. The air ejector off-gas monitors are connected in a 2 out of 2 logic arrangement. Based on the experience with instruments of similar design, a testing interval of once every three months has been found adequate.

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The automatic pressure relief instrumentation can be considered to be a 1 out of 2 logic system and the discussion above applies also.

LIMITING CONDITION FOR OPERATION

b. The results of laboratory carbon sample analysis shall show 90% radioactive methyl iodide removal at a velocity within 20% of system design, 0.05 to 0.15 mg/m3 inlet methyl iodide concentration, ≥ 95% relative humidity and ≥ 125 degrees F, or that filter train shall not be considered operable.

c. Fans shall be shown to operate at approximately 3,000 CFM ± 300 CFM (design flow for the filter train).

5. The main control room ventilation radiation monitors, which monitor main control room ventilation radiation levels, shall be operable at all times when secondary containment is required.

a. One radiation monitoring channel may be inoperable for 7 days, as long as the remaining radiation monitoring channel maintains the capability of initiating emergency ventilation on any designed trip functions.

b. A trip system is operable when 1 of 2 channels is available to provide its trip function and the inoperable channel is placed in its tripped condition. If a channel is inoperable or placed in its tripped condition in both trip systems, then emergency ventilation must be initiated and maintained.

SURVEILLANCE REQUIREMENTS

d. A dry gas purge shall be provided to the filters to insure that the relative humidity in the filter systems does not exceed 70% during idle periods.

e. A sample of the charcoal filter shall be analyzed once per year to assure halogen removal efficiency of at least 99.5 percent.

3. Once every 18 months automatic initiation of control room emergency ventilation, from all designed initiation signals shall be demonstrated.

4. Operability of the main control room ventilation radiation monitors and flow switches shall be functionally tested every 3 months.

5. The main control room radiation monitors shall be calibrated electronically and with a known radioactive source positioned in a reproducible geometry with respect to the sensor every 18 months.

6. The main control room ventilation supply flow switches shall be calibrated every 18 months.

LIMITING CONDITION FOR OPERATION

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SURVEILLANCE REQUIREMENTS

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6. The main control room ventilation supply flow switches shall be calibrated every 18 months.

LIMITING CONDITIONS FOR OPERATION

3.11.A (cont'd.)

6. The main control room ventilation supply flow switches shall be operable at all times when secondary containment is required except one flow switch may be inoperable for 7 days as long as the other flow switch is operable.

7. If specification 3.11.A.5 or 3.11.A.6 cannot be met, manually initiate and maintain main control room emergency ventilation.

B. Emergency Heat Sink Facility

The level in the emergency reservoir of the Emergency Heat Sink Facility shall not be less than 17'. Should the level drop below this point action shall be taken to restore the level to above the minimum, within 7 days.

C. Emergency Shutdown Control Panel

1. At all times when not in use or being maintained, the emergency shutdown control panels shall be secured.

SURVEILLANCE REQUIREMENTS

4.11.A (cont'd).

B. Emergency Heat Sink Facility

1. The level in the emergency reservoir of the Emergency Heat Sink Facility shall be checked once per month.

2. Once a year the portable fire pump which is used to provide makeup water to the emergency reservoir will be checked for operability and availability.

3a. The Emergency Cooling Water pump and ESW booster pumps shall be tested in accordance with Section XI of the ASME Boiler Pressure Vessel Code and applicable addenda, except where relief has been granted.

b. The Emergency Cooling Tower fans shall be tested every three months to verify operability.

C. Emergency Shutdown Control Panel

1. The emergency shutdown control panels shall be visually checked once per week to verify they are secured.

2. Operability of the switches on the emergency shutdown control panels shall be tested by electrical check once per refueling outage.

LIMITING CONDITIONS FOR OPERATION

3.11.A (cont'd.)

6. The main control room ventilation supply flow switches shall be operable at all times when secondary containment is required except one flow switch may be inoperable for 7 days as long as the other flow switch is operable.

7. If specification 3.11.A.5 or 3.11.A.6 cannot be met, manually initiate and maintain main control room emergency ventilation.

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SURVEILLANCE REQUIREMENTS

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3.11 BASES

A. Main Control Room Emergency Ventilation System

The control room emergency ventilation system (CREV) is designed to filter the control room intake air during control room isolation conditions. The CREV system is designed to automatically start upon receipt of control room isolation signals and to maintain the control room at a positive pressure so that all leakage should be out-leakage.

High efficiency particulate absolute (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers. The charcoal adsorbers are installed to reduce the potential intake of radioiodine to the control room. The in-place test results should indicate a system leak tightness of less than 1 percent bypass leakage for the charcoal adsorbers and a HEPA efficiency of at least 99 percent removal of DOP particulates. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90 percent for expected accident conditions. If the efficiencies of the HEPA filters and charcoal adsorbers are as specified, the resulting doses will be less than the allowable levels states in Criterion 19 of the General Design Criteria for Nuclear Power Plants, Appendix A to 10 CFR Part 50.

One main control room emergency ventilation air supply ı n provides adequate ventilation flow under accident conditions. Should one . mergency ventilation air supply fan and/or fresh air filter train be out of se :vice during reactor operation, the allowable repair time for 7 days is justif ed.

At least 1 of 2 channels per trip system in the Control Room Ventilation Radiation Monitoring System for indication and alarm of radioactive air being drawn into the main control room is considered adequate, provided that 3 of the 4 channels are available. With one channel of control room radiation monitoring inoperable the capability of automatically initiating emergency ventilation on receipt of any trip signal is still maintained and at no time is the ability to manually initiate emergency ventilation lost. Therefore, the allowable time for repair of 7 days is justified. When one (1) radiation monitoring channel in both trip systems are inoperable, then emergency ventilation shall be initiated and maintained. Main control room emergency ventilation is initiated when a trip signal from the radiation detectors is given via high radiation or downscale/failure signal (one out of two twice logic) or loss of divisional power to local radiation monitoring system panel. Main control room emergency ventilation is also initiated on a low flow signal from one of two flow switches in the main control room normal supply after a time delay.

3.11 BASES

A. Main Control Room Emergency Ventilation System

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One main control room emergency ventilation air supply fan provides adequate ventilation flow under accident conditions. Should one emergency ventilation air supply fan and/or fresh air filter train be out of service during reactor operation, the allowable repair time for 7 days is justified.

At least 1 of 2 channels per trip system in the Control Room Ventilation Radiation Monitoring System for indication and alarm of radioactive air being drawn into the main control room is considered adequate, provided that 3 of the 4 channels are available. With one channel of control room radiation monitoring inoperable the capability of automatically initiating emergency ventilation on receipt of any trip signal is still maintained and at no time is the ability to manually initiate emergency ventilation lost. Therefore, the allowable time for repair of 7 days is justified. When one (1) radiation monitoring channel in both trip systems are inoperable, then emergency ventilation shall be initiated and maintained. Main control room emergency ventilation is initiated when a trip signal from the radiation detectors is given via high radiation or downscale/failure signal (one out of two twice logic) or loss of divisional power to local radiation monitoring system panel. Main control room emergency ventilation is also initiated on a low flow signal from one of two flow switches in the main control room normal supply after a time delay.

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TABLE 4.15**

SEISMIC MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Instruments and Sensor Locations#	Instrument* Check	Instrument* Functional Test	Instrument Calibration
1. Triaxial Time-History Accelerographs			
a. Containment Foundation (torus compartment)	M	SA	R
b. Refueling Floor	M	SA	R
c. RCIC Pump (Rm #7)	M	SA	R
d. "C" Diesel Generator	M	SA	R
2. Triaxial Peak Accelerographs			
a. Reactor Piping (Drywell)	NA	NA	R
b. Refueling Floor	NA	NA	R
c. "C" Diesel Generator	NA	NA	R
3. Central Recording and Analysis System			
a. Cable Spreading Rm	M	SA	R

* Surveillance Frequencies

M: every month
SA: every 6 months
R: every 24 months

** Effective upon completion of installation.
# Seismic instrumentation located in Unit 2.

PBAPS

TABLE 4.15**

SEISMIC MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

Instruments and Sensor Locations#	Instrument* Check	Instrument* Functional Test	Instrument Calibration
1. Triaxial Time-History Accelerographs			
a. Containment Foundation (torus compartment)	M	SA	R
b. Refueling Floor	M	SA	R
c. RCIC Pump (Rm #7)	M	SA	R
d. "C" Diesel Generator	M	SA	R
2. Triaxial Peak Accelerographs			
a. Reactor Piping (Drywell)	NA	NA	R
b. Refueling Floor	NA	NA	R
c. "C" Diesel Generator	NA	NA	R
3. Central Recording and Analysis System			
a. Cable Spreading Rm	M	SA	R

* Surveillance Frequencies

M: every month
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** Effective upon completion of installation.
# Seismic instrumentation located in Unit 2.

ATTACHMENT 3

PEACH BOTTOM ATOMIC POWER STATION
UNITS 2 AND 3

Docket Nos. 50-277
50-278

License Nos. DPR-44
DPR-56

TECHNICAL SPECIFICATION CHANGE REQUEST
91-06

"Main Control Room Intake Air Radiation Monitors"
"Seismic Monitoring Instrumentation"

Description of Watchdog Circuitry

NRC microprocessor based instruments contain a "watchdog" circuit to detect failures that may cause the microprocessor to cease functioning. This circuit is implemented in hardware and is not software driven. In general, the watchdog circuit times out after a period of microprocessor inactivity and annunciates a failure after the time out period has elapsed.

The hardware implementation of the software reset circuitry (deadman switch) is described below. Refer to Figure 1 as required.

Initial system power on and /RESET pulse

When the unit is first powered on the system, a five volt power supply (+5V) is applied to the RC circuit comprised of R13 and C29. The delayed voltage on C29 is applied to the reset pin of U12A and U12B as well as U21C pin 10. This delayed voltage holds U12A and U12B in a reset state for approximately 1.5 seconds. The reset state causes U12 pin 9 to be at logic 0. With U21C pins 9 and 10 both at logic 0 the microprocessor master reset line (/RESET) is also held at logic 0. A logic 0 on /RESET holds the processor in a halted state where no software is executed.

The microprocessor will remain halted until the /RESET line is set to a logic 1. This occurs when C29 charges to approximately 2.5 volts. At that time U12A and U12B are released from their reset state and U12B pin 9 will be set to logic 1. Both U21C pins 9 and 10 are now logic 1, and the /RESET line will be set high, allowing the processor to begin executing software instructions.

REFRESH signal and automatic system reset

During system operation the microprocessor executes a software instruction which produces a /REFRESH signal approximately every 250 microseconds. The /REFRESH signal is applied to the U12A causing it to remain in a triggered state, with its output Q (U12A pin 6) at logic 1. The net effect of this is U12B pin 11 is logic 1, therefore U12B pin 9 is high and /RESET remains logic 1 and the microprocessor operate normally.

If the microprocessor should fail to execute software correctly or freeze for any reason, U12 would provide a microprocessor hardware reset as follows. With U12A pin 5 not being refreshed, U12A would time out after approximately 1.2 seconds, the time constant of R15 and C28. This would cause U12A pin 6 to be set to a logic 0, triggering U12B. U12B would then

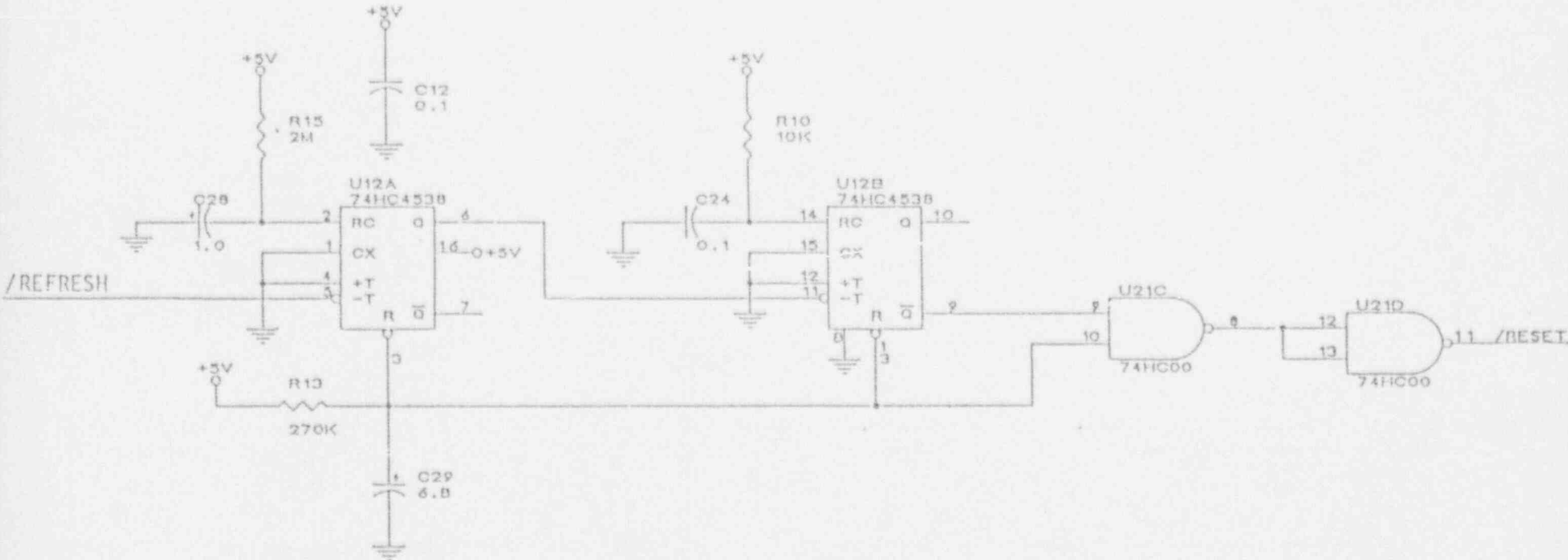
produce a logic 0 pulse of 63 milliseconds at pin 9. This pulse would appear on /RESET causing the microprocessor to perform a hardware reset and begin operating as normal. Once the microprocessor is reset and executes normal software instructions, it would then begin producing the /REFRESH signal and the system would continue to operate normally.

Failure relay activation from hardware

In addition to the deadman switch, an extra level of failure detection is built into the system by the use of a normally energized failure relay contact. The failure relay is controlled by a data latch external to the microprocessor. The microprocessor can manipulate the data latch, but the master reset line on the data latch is controlled by the /RESET line of the deadman circuitry. Therefore any /RESET pulse will reset the data latch, de-energize the failure relay, and cause a failure alarm state. In the case of multiple system resets due to the microprocessor being repeatedly reset but then freezing, each /RESET pulse would guarantee the fail relay was de-energized and in the fail alarm state.

FIGURE 1

RESET CIRCUIT, ADM-610A AND ADM-600A



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