May 31, 199

Docket No. 50-331

Mr. Lee Liu
Chairman of the Board and
Chief Executive Officer
IES Utilities Inc.
Post Office Box 351
Cedar Rapids, Iowa 52406

Dear Mr. Liu:

SUBJECT: DUANE ARNOLD ENERGY CENTER - CORRECTION TO AMENDMENT NOS. 197 AND 198 TO FACILITY OPERATING LICENSE NO. DPR-49 (TAC NO. M84943 AND 88617)

On May 12, 1994, the Commission issued Amendment No. 197 in response to your application dated March 24, 1993, and on May 13, 1994, issued Amendment No. 198 in response to your application dated January 21, 1994, for the Duane Arnold Energy Center.

The reproduction quality of the amendment packages were poor. Many of the revision bars on the sides of the revised Technical Specification pages did not reproduce clearly. Also, page 3.8-7 for Amendment No. 198 was corrected to reflect a change in the Figure identification number in Amendment No. 197 to Figure 4.8.E-1 from Figure 4.8.C-1. An improved copy of the Technical Specification pages from Amendment Nos. 197 and 198, including the corrected page, is enclosed for your use.

Please accept our apologies for any inconvenience.

Sincerely,

Original signed by

Robert M. Pulsifer, Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Enclosures:
Technical Specification Pages
from Amendment Nos. 197 and 198

cc w/enclosures:
See next page

Distribution next page:

OFC	LA:PDIII-3	PM:PDIII-3	D:PDIII-3			
NAME	MRUSHBROOK	RPULSIFER	JHANNON			
DATE	5/23/94	5/23/94	5/27/94	/ /94	/ /94	/ /94
COPY	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO	YES/NO

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IES Utilities Inc.

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Distribution:
Docket File 50-331
NRC & Local PDR
PDIII-3 Reading
J. Roe
J. Zwolinski
J. Hannon
M. Rushbrook
R. Pulsipher
OGC - OWF 15B18
D. Hagan
G. Hill (2)
C. Morris - OWF 7E4
C. Berlinger - OWF 7E4
ACRS (10)
OPA - OWF 2G5
OC (LFDCB)
E. Greenman, RIII

TECHNICAL SPECIFICATIONS

LIST OF FIGURES

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
G. Minimum Low Pressure Cooling and Diesel Generator Availability	G. Minimum Low Pressure Cooling and Diesel Generator Availability
1. During any period when one diesel generator is inoperable, continued reactor operation is permissible only during the succeeding seven days unless such diesel generator is sooner made OPERABLE, provided that the remaining diesel generator and all low pressure core and containment cooling subsystems supported by the OPERABLE diesel generator are OPERABLE. If this requirement cannot be met, an orderly SHUTDOWN shall be initiated and the reactor shall be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	1. When it is determined that one diesel generator is inoperable, the remaining diesel generator shall be demonstrated to be OPERABLE in accordance with Specification 4.8.A.2.a.1.a within the first 24 hours and every subsequent 72 hours thereafter. In addition, all low pressure core cooling and containment cooling subsystems supported by the OPERABLE diesel shall be verified to be OPERABLE.
2. Any combination of inoperable components in the core and containment cooling systems shall not defeat the capability of the remaining OPERABLE components to fulfill the cooling functions.	
3. When irradiated fuel is in the reactor vessel and the reactor is in the COLD SHUTDOWN Condition or REFUEL Mode:	
a. If no work is being performed which has the potential for draining the reactor vessel, both core spray and RHR systems may be inoperable; or	
b. If work is being performed which has the potential for draining the reactor vessel, at least two of any combination of core spray and/or RHR (LPCI or shutdown cooling mode) pumps shall be OPERABLE (including the capability to inject water into the reactor vessel with suction from the suppression pool) except as	

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.8 AUXILIARY ELECTRICAL SYSTEMS	4.8 AUXILIARY ELECTRICAL SYSTEMS
Applicability:	Applicability:
Applies to the auxiliary electrical power systems.	Applies to the periodic testing requirements of the auxiliary electrical power systems.
Objective:	Objective:
To assure an adequate supply of electrical power for operation of those systems required for safety.	Verify the OPERABILITY of the auxiliary electrical systems.
Specification:	Specification:
A. AC Power Systems	A. AC Power Systems
At all times when the reactor is in the RUN Mode or STARTUP Mode and not in a COLD CONDITION, the following AC electrical power sources shall be OPERABLE:	
1. Both offsite sources and the startup and standby transformers are available and capable of supplying power to the 4kV emergency buses.	
2. Operation with Inoperable Components.	1. Surveillance Requirements with Inoperable Components.
a. With one of the offsite sources or startup or standby transformers inoperable, maintain the other offsite source OPERABLE and both emergency diesel generators OPERABLE.	
b. With one of the offsite sources or the startup or standby transformers and one emergency diesel generator inoperable, the requirements of Specification 3.5.G.1 shall be satisfied.	a. With one of the offsite sources or the startup or standby transformers and one emergency diesel generator inoperable, the requirements of Specification 4.5.G.1 shall be satisfied.
c. With both the startup and standby transformers inoperable, maintain both emergency diesel generators, associated buses and all Low Pressure Cooling Systems OPERABLE and either:	b. With both the startup and standby transformers inoperable, verify that both emergency diesel generators are either OPERABLE or operating and the requirements of Specification 4.5.G.1 shall be satisfied.
1) Restore one or both of the transformers to OPERABLE status, or	
2) Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	

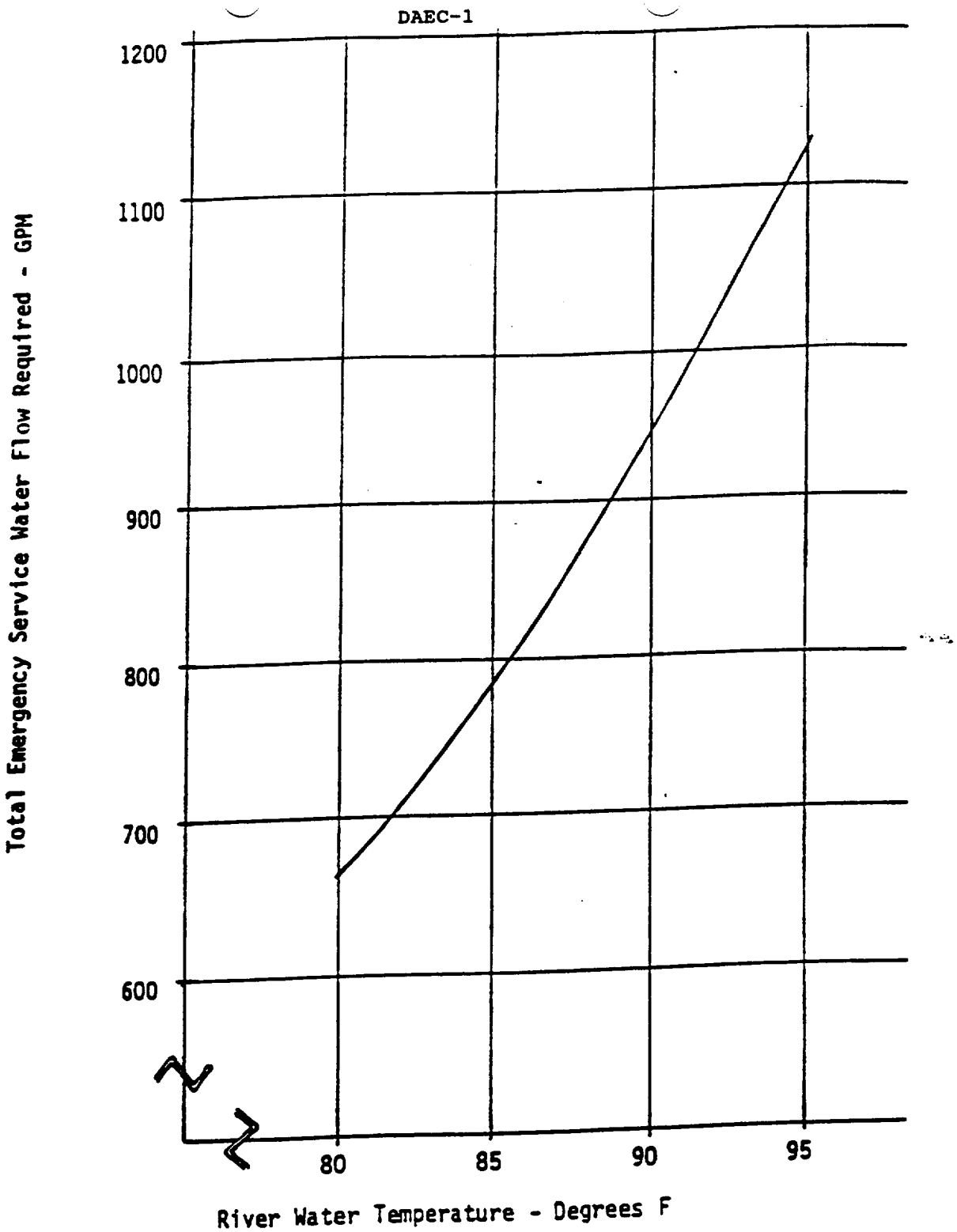
LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3. Emergency Diesel Generators The two emergency diesel generators shall be OPERABLE with a minimum of 36,317 gallons of diesel fuel in the diesel fuel oil tank.	2. Emergency Diesel Generators a. Diesel Start Test 1) Once each month both emergency diesel generators shall be: a) Manually started, the speed increased from idle to synchronous, and verified to deliver rated voltage and frequency. b) Manually loaded to rated load. The test shall continue for at least a one-hour period at rated load. c) During the monthly start test the emergency diesel generator starting air compressors shall be checked for operation and their ability to recharge air receivers. The operation of the diesel fuel oil transfer pumps shall also be demonstrated during this test. 2) Once each six months both emergency diesel generators shall be manually started and loaded to demonstrate that they will reach rated frequency and voltage within specified time limits. This test may be run in lieu of the regular monthly test. During the semiannual test the same checks to the Air Start System and fuel oil pumps performed during monthly testing shall be performed. In addition, the emergency diesel generator starting time to reach rated frequency and voltage shall be recorded. b. Once per OPERATING CYCLE the condition under which the emergency diesel generator is required will be simulated and a test conducted to demonstrate that it will start and accept the emergency load within the specified time sequence. The emergency diesel generator shall be operated loaded for a minimum of 5 minutes. The results shall be recorded. c. Once per OPERATING CYCLE, during shutdown, each emergency diesel generator shall be given an inspection in accordance with

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
	procedures based on the manufacturer's recommendations.
	d. A sample shall be drawn from each diesel fuel delivery and tested for API gravity, viscosity, and water and sediment prior to addition to the storage tank. Once it is determined that the fuel meets the criteria for these characteristics specified in ASTM-D975-77, the fuel may be added to the tank.
	e. The quantity of diesel fuel available shall be recorded monthly and after each use of the diesels.
	f. Once per month a sample of diesel fuel shall be checked for viscosity, water and sediment. The values for viscosity, water and sediment shall be within the acceptable limits specified in Table 1 of ASTM D975-77 and recorded.
	g. Once each 3 months a sample of diesel fuel shall be checked for particulate accumulation and the amount recorded. The amount of particulates shall not exceed 10 mg/liter when filtered through a 0.8 micron filter.
4. Operation with Inoperable Components.	3. Surveillance Requirements with Inoperable Components.
a. With one of the emergency diesel generators inoperable, the requirements of Specification 3.5.G.1 shall be met.	a. When it is determined that one of the emergency diesel generators is inoperable, the requirements of Specification 4.5.G.1 shall be met.
b. With both of the emergency diesel generators inoperable either:	
1) Restore one or both emergency diesel generators to OPERABLE status, or	
2) Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	
B. <u>DC Power Systems</u>	B. <u>DC Power Systems</u>
1. At all times when the reactor is in the RUN Mode or STARTUP Mode and not in a COLD CONDITION, the essential station 24, 125 and 250 Volt DC Power Systems shall be OPERABLE. The associated battery	1. The DC Power System surveillance shall be as follows:
	a. Each week the specific gravity, the voltage and temperature of the pilot cell and overall battery

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
chargers for the 24 Volt Systems, two of the three battery chargers for the 125 Volt Systems, and one of the two battery chargers for the 250 Volt System shall be OPERABLE.	voltage shall be measured and recorded. b. Each three months the essential batteries' voltage of each cell to the nearest 0.01 Volt, specific gravity of each cell, and temperature of every fifth cell shall be measured and recorded. c. Once each OPERATING CYCLE, the essential batteries shall be subjected to a Service Discharge Test (load profile). The specific gravity and voltage of each cell shall be determined after the discharge and recorded. d. Once every five years, the essential batteries shall be subjected to a Performance Discharge Test (capacity). This test will be performed in lieu of the Service Test requirement of 4.8.B.1.c above.
2. Operation with Inoperable Components. a. With normal battery room ventilation unavailable, portable ventilation equipment shall be provided. b. With one of the two 125 Volt DC Systems inoperable, verify that Specification 3.5.G is met, and within 3 days either: 1) Restore the inoperable 125 Volt DC System to OPERABLE status, or 2) Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. c. With the 250 Volt DC System inoperable, the HPCI System and other affected primary containment isolation valves shall be considered inoperable and the requirements of Specifications 3.5.D and 3.7.D respectively shall be met. d. With one of the 24 Volt DC Systems inoperable, the requirements associated with the affected instruments of Specifications 3.1 and 3.2 shall be met.	2. Surveillance Requirements with Inoperable Components. a. With the battery room ventilation unavailable, samples of the battery room atmosphere shall be taken daily for hydrogen concentration determination.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
C. Onsite Power Distribution Systems	C. Onsite Power Distribution Systems
1. At all times when the reactor is in the RUN Mode or STARTUP Mode and not in a COLD CONDITION the essential AC 4160 volt buses 1A3 and 1A4, and 480 volt buses 1B3, 1B4, 1B9 and 1B20 shall be energized and OPERABLE.	1. Once each 4 OPERATING CYCLES each circuit breaker shall be subjected to inspection and preventive maintenance in accordance with procedures based on the manufacturer's recommendations.
2. Operation with Inoperable Components.	
a. With one of the essential AC 480 volt buses, 1B9 or 1B20, inoperable, restore the bus to OPERABLE status within 7 days, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	
b. With one of the essential AC 4160 volt buses, 1A3 or 1A4, or 480 volt buses 1B3 or 1B4 inoperable, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	
D. Auxiliary Electrical Equipment - CORE ALTERATIONS	
Refer to Specification 3.9.D.	

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
E. Emergency Service Water System	E. Emergency Service Water System
1. Except as required in Specification 3.8.E.2 below, both Emergency Service Water System loops shall be OPERABLE whenever irradiated fuel is in the reactor vessel and reactor coolant temperature is greater than 212°F.	1. Emergency Service Water System surveillance shall be as follows: a. Simulated automatic actuation test. — Once/OPERATING CYCLE b. Pump and motor operated valve OPERABILITY — Once/3 months c. Flow Rate Test Each Emergency Service Water pump shall deliver at least that flow determined from Figure 4.8.E-1 for the existing river water temperature. — After major pump maintenance and once per 3 months, except weekly during periods of time the river water temperature exceeds 80°F.
2. With one of the Emergency Service Water System pumps or loops inoperable, REACTOR POWER OPERATION must be limited to seven days unless OPERABILITY of that system is restored within this period. During such seven days all active components of the other Emergency Service Water System shall be OPERABLE, provided the requirements of Specification 3.5.G are met.	2. With one Emergency Service Water System pump or loop inoperable, the OPERABLE pump and loop shall be verified to be OPERABLE. In addition, the requirements of Specification 4.5.G.1 shall be met.
3. If the requirements of Specification 3.8.E cannot be met, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	



DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
DAEC EMERGENCY SERVICE WATER FLOW REQUIREMENT FIGURE 4.8.E-1

3.8 BASES:

The objective of this specification is to assure that adequate power will be available to operate essential equipment. Adequate AC power can be provided by any one of the following sources: The startup transformer, the standby transformer or either of the two emergency diesel generators. The startup transformer provides all auxiliary power during plant startup and until the main generator is synchronized with the system. After synchronization, the plant auxiliary buses 1A1 and 1A2 are manually transferred to the auxiliary transformer. The startup transformer continues to provide the normal source of power to essential AC buses 1A3 and 1A4. The standby transformer is connected to either of the two essential AC buses by automatic switching upon loss of power from the startup transformer.

This Specification assures that at least two offsite and two onsite AC power sources will be available before the reactor is taken beyond "just critical" testing. The two offsite sources are 161 KV and 345 KV power which are supplied to the startup and standby transformers respectively, through the DAEC site switchyard. These power sources are provided through the several transmission lines tied to the regional power grid. In addition to assuring power source availability, all of the associated essential AC switchgear must be operable as specified to assure that the emergency core cooling equipment can be operated, if required, from the power sources.

The minimum diesel fuel supply of 36,317 gallons will supply one emergency diesel generator for a minimum of seven days of operation satisfying the load requirements for the operation of the essential equipment. Additional fuel can be obtained and delivered to the site from nearby sources within the seven day period.

A battery charger is supplied with each of the two 125 volt DC station batteries. In addition, a spare charger is available and can supply power to either 125 Volt DC System. Since this alternative source is available, one battery charger can be allowed out of service for maintenance and repairs. Similarly, one of the two battery chargers provided for the 250 volt DC station battery can be allowed out of service for maintenance and repairs.

Adequate power is available to operate all essential equipment from either the startup transformer or the standby transformer. In addition, each of the emergency diesel generator units is capable of supplying the essential AC-powered loads required under postulated design basis accident conditions. Each unit is physically and electrically independent of the other and of any offsite power source. Therefore, one emergency diesel generator can be allowed out of service for a period of seven days to allow reasonable repairs. In such cases, emergency diesel generator OPERABILITY demonstrations will be limited to an unloaded start test.

In the event that the startup or standby transformer and one emergency diesel generator is inoperable, adequate power is available to operate the essential equipment from either the OPERABLE transformer or the OPERABLE emergency diesel generator. If both the startup and standby transformers are inoperable, either emergency diesel generator is sufficient to operate the essential AC-powered loads.

Each of the two 125 volt DC and the 250 volt DC station batteries has enough capacity to energize its vital buses and supply DC power to the other essential DC-powered equipment for four hours without being recharged. Due to the high reliability of battery systems, one of the two batteries may be out of service for up to three days. This minimizes the probability of unwarranted shutdown by providing adequate time for reasonable repairs. A station battery is considered inoperable if more than one cell is out of service. A cell will be considered out of service if its float voltage is below 2.13 volts and the specific gravity is below 1.190 at 77°F.

The 250 Volt DC System provides power for the HPCI system and other primary containment isolation valves. If the battery is taken out of service, the HPCI system would be inoperable and the requirements of Specification 3.5.D for this condition must be satisfied. Certain primary containment isolation valves would also be inoperable, thus the requirements of Specification 3.7.D must be satisfied.

The 24 Volt DC System provides power for reactor neutron monitoring and process radiation monitoring. The neutron monitoring function is fail-safe in that loss of 24 volt DC power would cause the associated trip to occur (UFSAR Section 8.3.2).

The battery room is ventilated to prevent accumulation of hydrogen gas exceeding 4 percent concentration. On loss of battery room ventilation, the use of portable ventilation equipment and daily sampling provides assurance that potentially hazardous quantities of hydrogen gas will not accumulate.

4.8 BASES:

Offsite power availability and onsite power distribution is continuously monitored by INSTRUMENTATION which alerts operators to any problems so that appropriate action can be taken. In addition to the annunciators, automatic switching occurs to maintain power to the emergency buses at all times. The breakers and distribution panels are subjected to preventive maintenance based on manufacturer's recommendations. The schedule is based on performance of maintenance on one of the buses (1A1, 1A2, 1A3 and 1A4) each Refuel Outage.

The monthly tests of the emergency diesel generators (EDGs) are conducted to demonstrate satisfactory system performance and OPERABILITY. To prevent excessive wear and stress on the diesel engines, the diesels are manually started and the speed incrementally increased to synchronous speed. With one EDG inoperable, the remaining EDG can be demonstrated to be OPERABLE by starting and verifying proper output voltage and frequency. Once every six months, a fast-start test is performed to demonstrate the capabilities of the diesel engines to accelerate to rated speed as required for the design basis for the plant. The test of the automatic starting circuits will prove that each EDG will receive all automatic start signals. The loading of each EDG is conducted to demonstrate proper operation at maximum expected emergency loading and at equilibrium operating conditions. Generator experience at other generating stations, and NRC published guidance (Generic Letter 84-15), indicates that the testing frequency is adequate to assure a high reliability of operation should the system be required.

Each EDG has two independent starting air supply systems. One consists of a motor driven air compressor which automatically recharges two air receivers and the other consists of a diesel driven air compressor which is manually operated to recharge a third air receiver. During the monthly check of the EDG, both air start systems will be checked for proper operation.

Following the tests (at least monthly) or other operation of the EDGs, the fuel volume remaining in the diesel oil storage tank will be checked.

At the end of the monthly load test of the EDG, the fuel oil transfer pump will be operated to refill the day tank and to check the operation of this pump. The day tank level indicator and alarm switches and fuel oil transfer pump control switches will be checked at this time.

The test of the EDGs once each OPERATING CYCLE will be more comprehensive in that it will functionally test the system; i.e., it will check starting of the diesel and closure of electrical breakers and sequencing of essential loads. The test will be initiated by simulation of a loss-of-coolant accident. In addition, a loss of normal AC power condition will be imposed to simulate a loss of offsite power. The essential load sequence timing will be checked to assure proper loading in the time required. Periodic tests check the capability of the units to start in the required time and to deliver the expected emergency load requirements. Periodic testing of the various components plus a FUNCTIONAL TEST each OPERATING CYCLE are sufficient to maintain adequate reliability.

Recording the diesel fuel supply after each operation (at least monthly) assures that the minimum fuel supply requirements will be maintained. New fuel is tested against the specification, ASTM D975-77 (API gravity, viscosity and water and sediment prior to addition, and the other characteristics within 30 days of addition to the storage tank). A monthly test for quality of the diesel fuel oil will be performed to verify that viscosity and water and sediment are within the limits specified in ASTM D975-77. The quality of the diesel fuel oil will be acceptable if the results of the tests are within the limiting requirements for diesel fuel oils shown on Table 1 of ASTM D975-77. Additionally, a quarterly test for particulate accumulation in the

stored fuel oil will provide further assurance that the fuel oil is not deteriorating to the point that EDG operation would be affected. This characteristic is trended so that actions can be taken to restore fuel quality prior to reaching unacceptable levels. Should a test result show unacceptable particulate accumulation which does not fit an established trend, a second sample is allowed to be tested prior to taking actions to restore the fuel.

Although the station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure.

The Service Discharge Test provides adequate indication of the batteries' ability to satisfy the design requirements (battery duty cycle) of the associated DC system. This test will be performed using simulated loads at the rates and for the durations specified in the design load profile.

The Performance Discharge Test provides adequate indication and assurance that the batteries have the specified ampere hour capacity. The rate of discharge during this test shall be in accordance with the manufacturer's discharge characteristic curves. The results of these tests will be recorded and compared with the manufacturer's recommendations of acceptability.

The Emergency Service Water System has two loops with one pump each. If one Emergency Service Water System loop becomes inoperable, the other loop provides sufficient cooling to components to assure performance of the safety function after an accident. Continued plant operation with one loop inoperable is restricted to a seven-day period during which time the OPERABLE Emergency Service Water loop is verified to be OPERABLE.

The surveillance test intervals for the Emergency Service Water pumps and associated valves are based on Section XI of the ASME Code.

APPENDIX A

TO

OPERATING LICENSE DRP-49

TECHNICAL SPECIFICATIONS AND BASES

FOR

DUANE ARNOLD ENERGY CENTER

IES UTILITIES INC.

CENTRAL IOWA POWER COOPERATIVE

CORN BELT POWER COOPERATIVE

DOCKET NO. 50-331

FEBRUARY 1974

AMENDMENT NO. 198

TECHNICAL SPECIFICATIONS
LIST OF TABLES

34. VENTING

VENTING is the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is not provided or required during the process. Vent, used in system names, does not imply a VENTING process.

35. PROCESS CONTROL PROGRAM (PCP)

The PROCESS CONTROL PROGRAM shall contain the current formulas, sampling, analysis, tests, and determinations to be made to ensure that processing and packaging of solid radioactive wastes based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to ensure compliance with 10 CFR Parts 20, 61, 71, state regulations, burial ground requirements, and other requirements governing the disposal of solid radioactive waste.

36. MEMBER(S) OF THE PUBLIC

MEMBER(S) OF THE PUBLIC are persons who are not occupationally associated with IES Utilities Inc. and who do not normally frequent the DAEC site. The category does not include contractors, contractor employees, vendors or persons who enter the site to make deliveries or to service equipment.

37. SITE BOUNDARY

The SITE BOUNDARY is that line beyond which the land is neither owned, nor leased, nor otherwise controlled by IES Utilities Inc. UFSAR Figure 1.2-1 identifies the DAEC SITE BOUNDARY. For the purpose of implementing radiological effluent controls, the Unrestricted Area is that land (offsite) beyond the SITE BOUNDARY.

38. ANNUAL

Occurring every 12 months.

For the purpose of designating surveillance test frequencies, ANNUAL surveillance tests are to be conducted at least once per 12 months.

39. CORE OPERATING LIMITS REPORT

The CORE OPERATING LIMITS REPORT is the DAEC-specific document that provides cycle-specific operating limits for the current operating reload cycle. These cycle-specific operating limits shall be determined for each reload cycle in accordance with TS 6.11.2. Plant operation within these limits is addressed in individual technical specifications.

40. SHUTDOWN MARGIN

SHUTDOWN MARGIN is the amount of reactivity by which the reactor is subcritical or would be subcritical assuming all control rods are inserted, except for the analytically strongest worth control rod, which is fully withdrawn, with the core in its most reactive state during the OPERATING CYCLE.

TABLE 1.0-1

OPERATING MODES

	OPERATING MODE	REACTOR MODE SWITCH POSITION	AVERAGE REACTOR COOLANT TEMPERATURE
1.	RUN/POWER OPERATION	Run	NA
2.	STARTUP	Startup/Hot Standby or Refuel[a]	NA
3.	HOT SHUTDOWN[a]	Shutdown[c][d]	> 212°F
4.	COLD SHUTDOWN[a]	Shutdown[c][d][e]	≤ 212°F
5.	REFUELING[b]	Shutdown or Refuel[c][f]	NA

(a) Fuel in the reactor vessel with the reactor vessel head closure bolts fully tensioned.

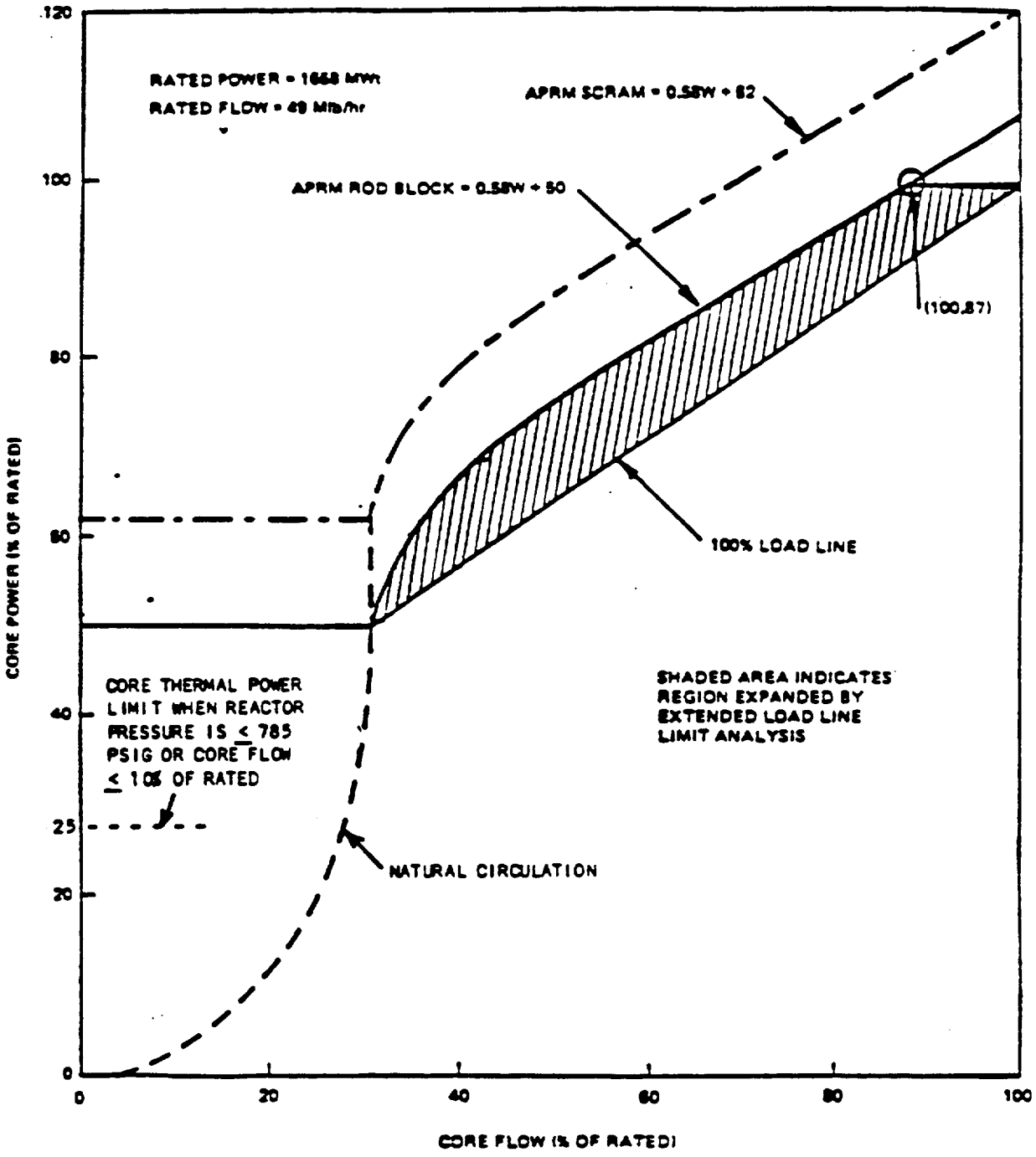
(b) Fuel in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.

(c) The reactor mode switch may be placed in the Run, Startup/Hot Standby or Refuel position to test the switch interlock functions and related instrumentation provided that the control rods are verified to remain fully inserted by a second licensed operator.

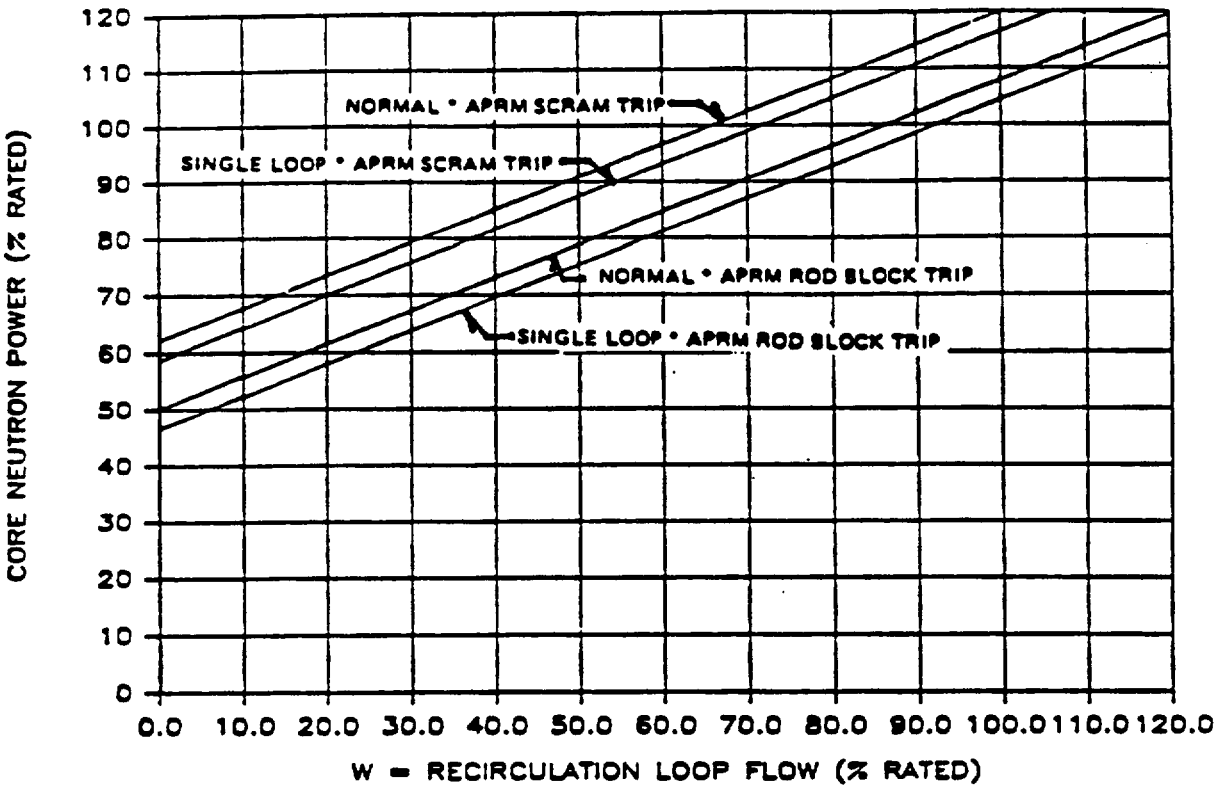
(d) The reactor mode switch may be placed in the Refuel position while a single control rod is being recoupled or withdrawn provided that the one-rod-out interlock is OPERABLE.

(e) The reactor mode switch may be placed in the Refuel position while a single control rod drive is being removed from the reactor pressure vessel per Specification 3.9.A.

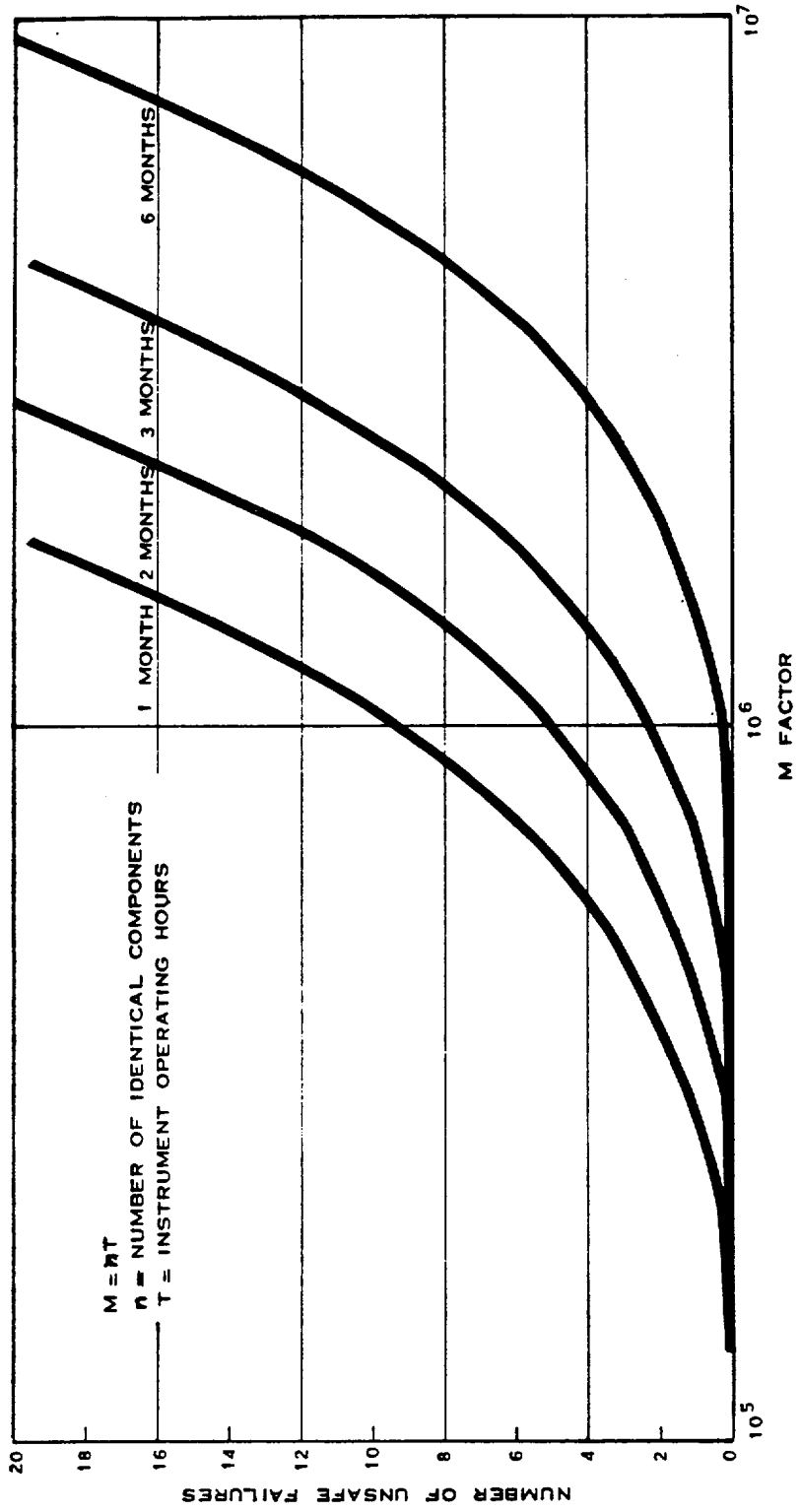
(f) The reactor mode switch may be placed in the Startup position for demonstration of shutdown margin per Specification 4.3.A.1.



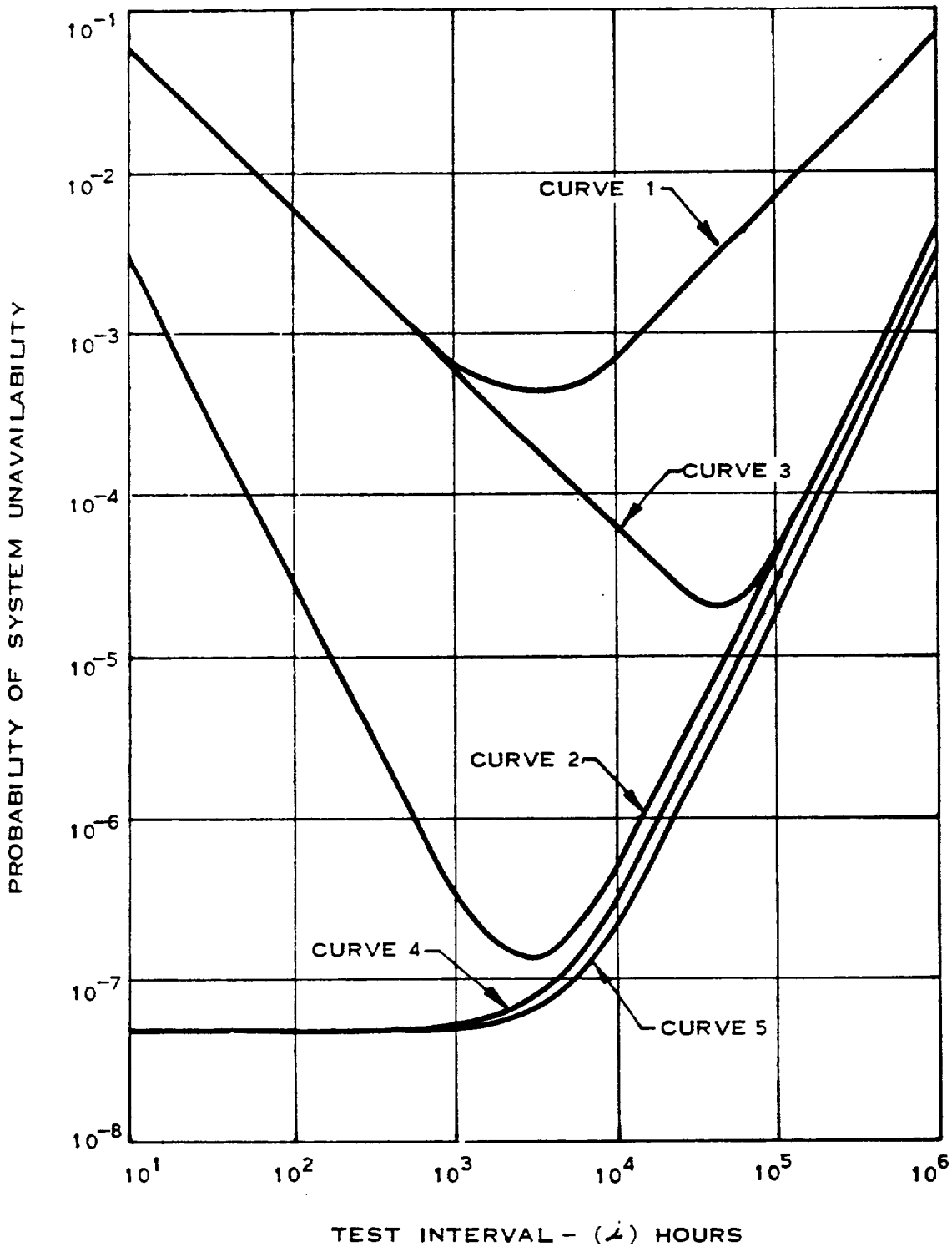
DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
APRM FLOW BIAS SCRAM RELATIONSHIP TO NORMAL OPERATING CONDITIONS FIGURE 1.1-1



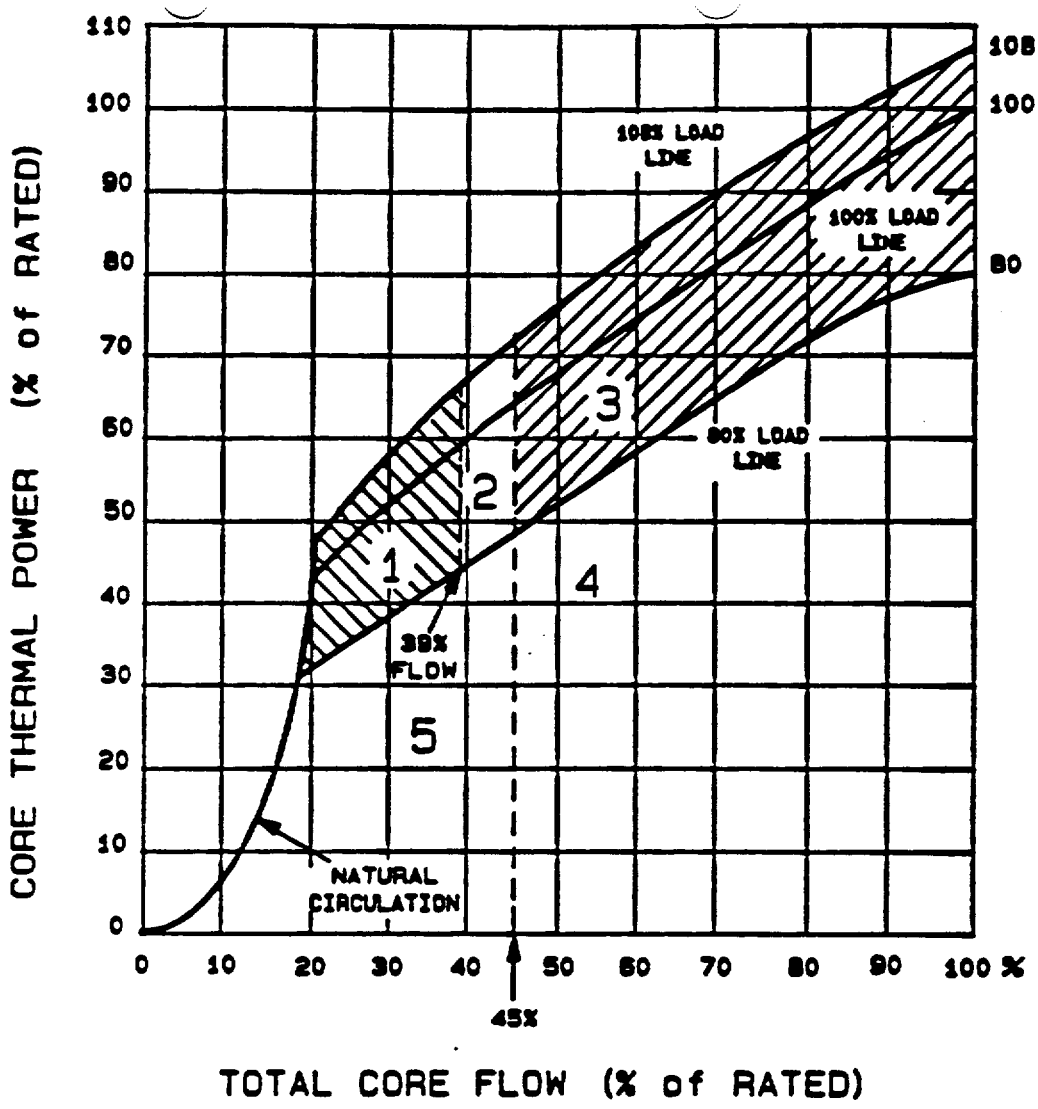
DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
CORE POWER Vs RECIRC LOOP FLOW FIGURE 2.1-1



DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
FAILURE HISTORY FIGURE 4.1-1



DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
CHANNEL AVAILABILITY FIGURE 4.2-2



Region 1: Two Loop Surv. Region, SLO Prohibited Region
- requires APRM/LPRM noise monitoring

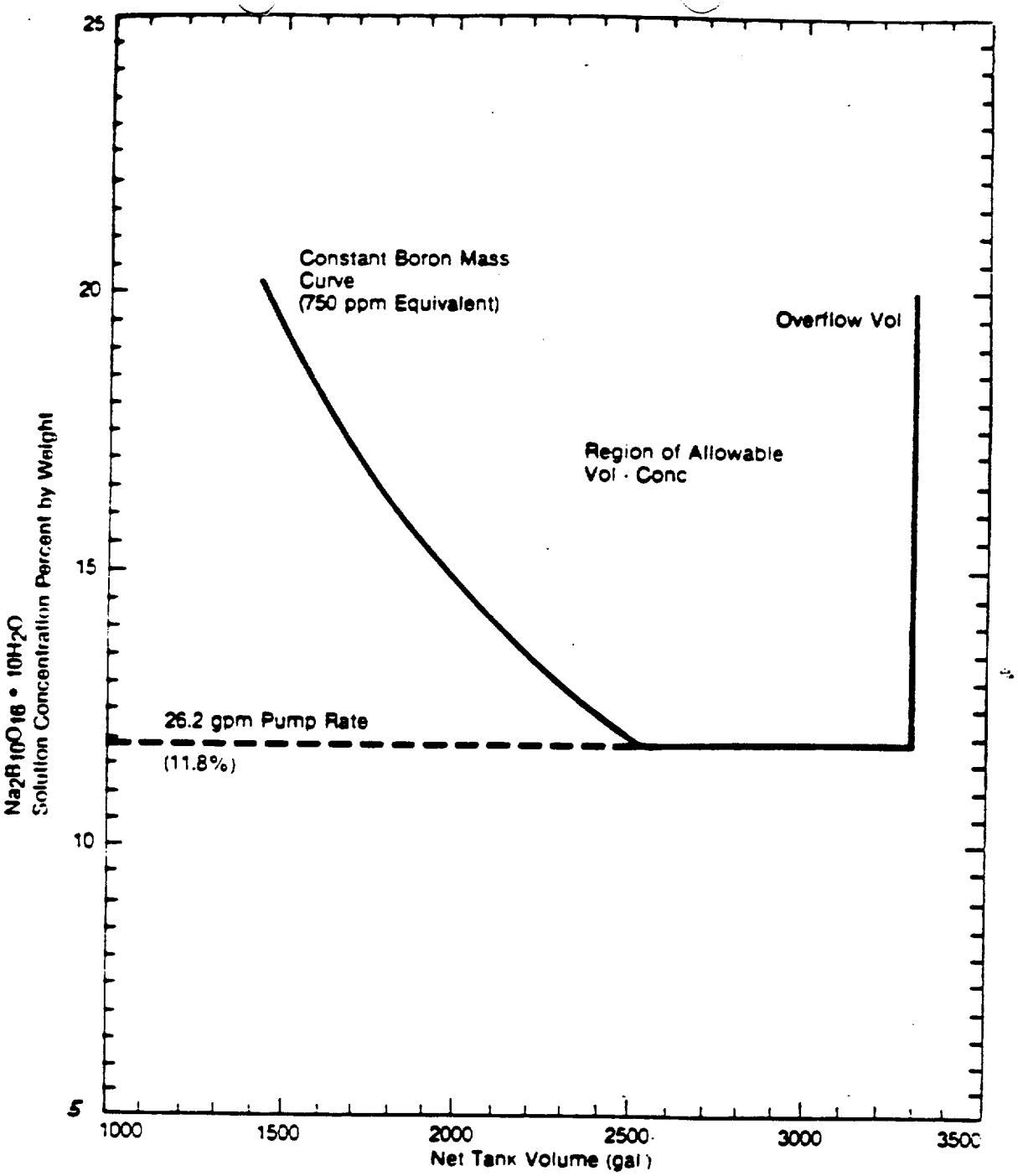
Region 2: Two Loop & SLO Surv. Region
- requires APRM/LPRM noise monitoring

Region 3: SLO Surv. Region
- requires APRM/LPRM & Core Plate D/P noise monitoring

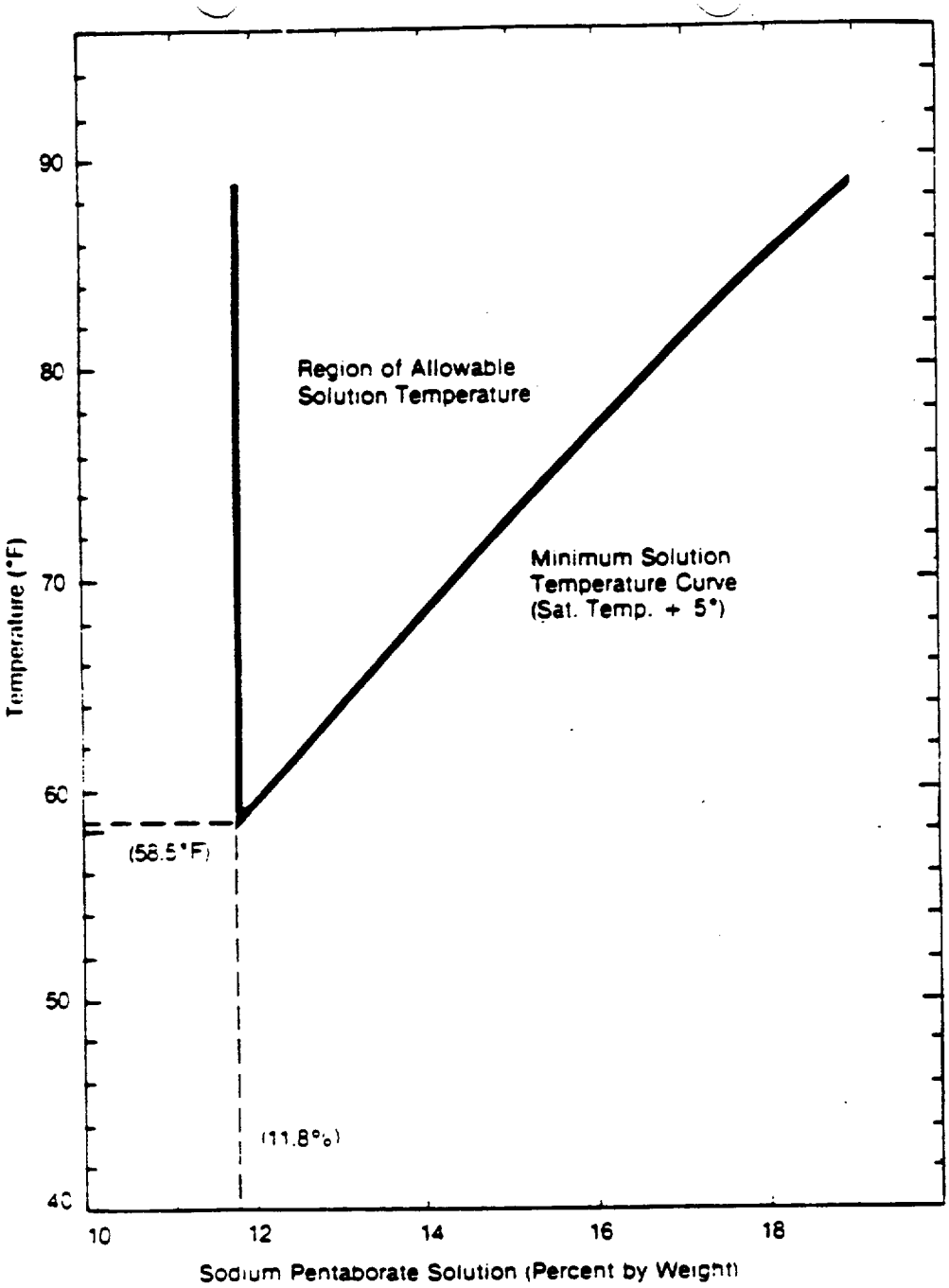
Region 4: Extended SLO Surv. Region
- requires Core Plate D/P noise monitoring

Region 5: Unrestricted Two Loop & SLO Region

DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
THERMAL POWER Vs CORE FLOW LIMITS FOR THERMAL HYDRAULIC STABILITY SURVEILLANCE FIGURE 3.3-1



DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
SODIUM PENTABORATE SOLUTION VOLUME CONCENTRATION REQUIREMENTS FIGURE 3.4-1

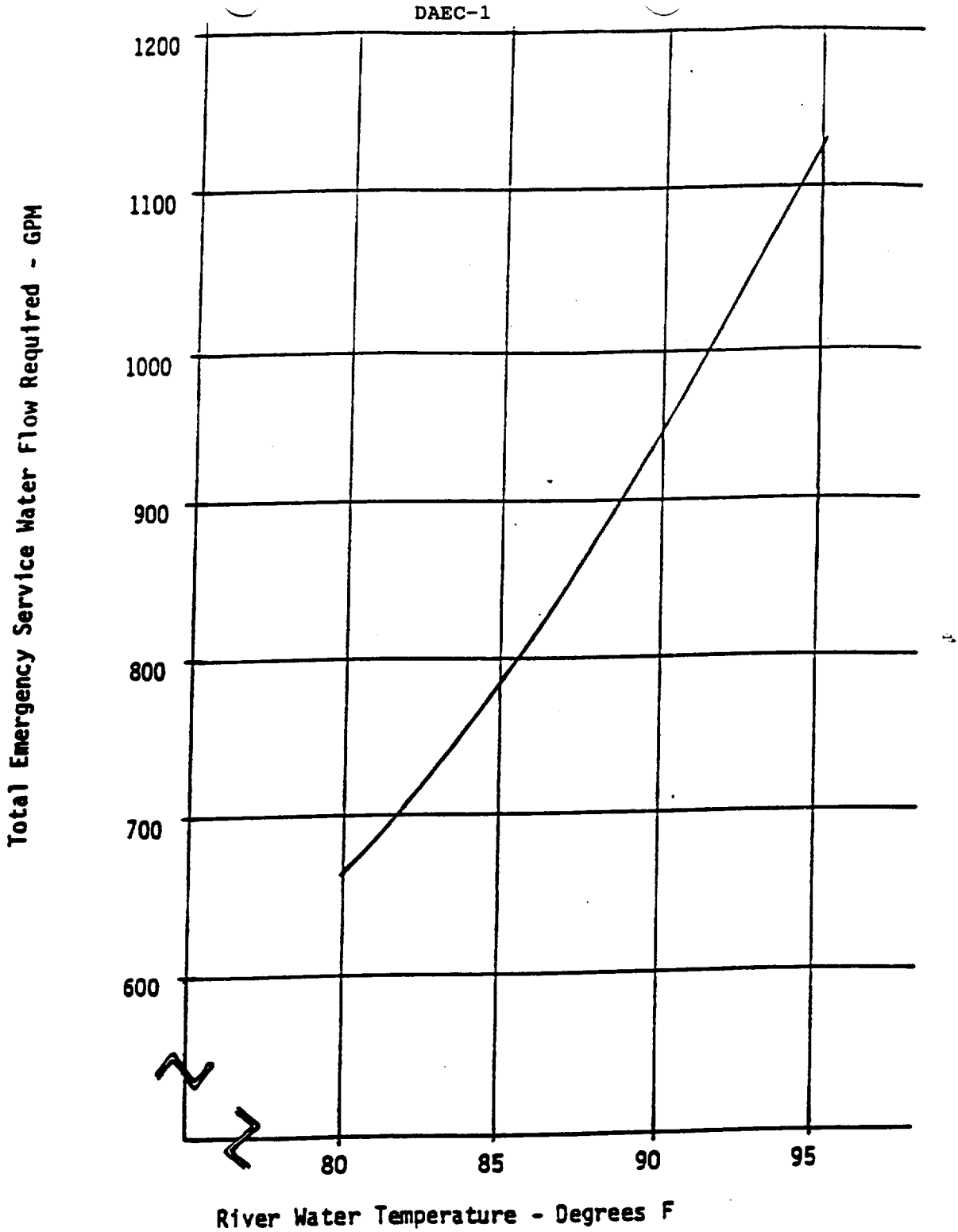


DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
MINIMUM TEMPERATURE OF SODIUM PENTABORATE SOLUTION FIGURE 3.4-2

The pressure suppression pool water provides the heat sink for the reactor primary system energy release following a postulated rupture of the system. The pressure suppression chamber water volume must absorb the associated decay and structural sensible heat released during primary system blowdown from 1040 psig. Since all of the gases in the drywell are purged into the pressure suppression chamber air space during a loss-of-coolant accident, the pressure resulting from isothermal compression plus the vapor pressure of the liquid must not exceed 62 psig, the suppression chamber maximum allowable pressure. The design volume of the suppression chamber (water and air) was obtained by considering that the total volume of reactor coolant to be condensed is discharged to the suppression chamber and that the drywell volume is purged to the suppression chamber.

Using the minimum or maximum water volumes given in the specification, containment pressure during the design basis accident is approximately 43 psig which is below the design pressure of 56 psig. The minimum volume of 58,900 ft^3 results in a submergence of approximately 3 feet. Based on Humboldt Bay, Bodega Bay, and Marviken test facility data as utilized in General Electric Company document number NEDE-21885-P and data presented in Nutech document, IES Utilities Inc. document number 7884-M325-002, the following technical assessment results were arrived at:

1. Condensation effectiveness of the suppression pool can be maintained for both short and long term phases of the Design Basis Accident (DBA), Intermediate Break Accident (IBA), and Small Break Accident (SBA) cases with three feet submergence.



DUANE ARNOLD ENERGY CENTER IES UTILITIES INC. TECHNICAL SPECIFICATIONS
DAEC EMERGENCY SERVICE WATER FLOW REQUIREMENT FIGURE 4.8.E-1

5.0 DESIGN FEATURES

5.1 SITE

The Duane Arnold Energy Center site is located on the western side of a north-south reach of the Cedar River, approximately 2-1/2 miles nort-northeast of the village of Palo, Iowa. The site consists of approximately 500 acres owned by IES Utilities Inc. The plan of the site is shown on Figures 1.2-1 and 1.2-2 of the Updated FSAR. The minimum distance to the boundary of the exclusion area as defined in 10 CFR 100.3 is approximately 1000 feet.

6.0 ADMINISTRATIVE CONTROLS

6.1 MANAGEMENT - AUTHORITY AND RESPONSIBILITY

6.1.1 The Plant Superintendent-Nuclear has primary responsibility for the safe operation of the DAEC, and reports to the Vice President, Nuclear.

6.1.2 The overall responsibility for the fire protection program for DAEC is assigned to the Vice President, Nuclear. The DAEC Plant Superintendent-Nuclear is responsible for directing the operating plant fire protection program.

6.1.3 The Manager, Corporate Quality Assurance is responsible for implementation of the Quality Assurance Program at DAEC.

6.2 ORGANIZATION

6.2.1 ONSITE AND OFFSITE ORGANIZATION

Onsite and offsite organizations shall be established for unit operation and corporate management, respectively. The onsite and offsite organizations shall include positions for activities affecting the safety of the nuclear power plant.

a. Lines of authority, responsibility, and communication shall be established and defined from the highest management levels through intermediate levels to and including all operating organization positions. These relationships shall be documented and updated, as appropriate in the form of organization charts, functional descriptions of departmental responsibilities and relationships, and job descriptions for key personnel positions, or in equivalent forms of documentation. These requirements shall be documented in the Duane Arnold Energy Center Updated Final Safety Analysis Report and updated in accordance with 10 CFR 50.71(e).

b. The plant Superintendent-Nuclear shall be responsible for overall unit safe operation and shall have control over those onsite activities necessary for safe operation and maintenance of the plant.

c. The Vice President, Nuclear shall have corporate responsibility for overall plant nuclear safety and shall take any measures needed to ensure acceptable performance of the staff in operating,

maintaining, and providing technical support to the plant to ensure nuclear safety.

d. The individuals who train the operating staff and those who carry out health physics and quality assurance functions may report to the appropriate onsite manger; however, they shall have sufficient organizational freedom to ensure their independence from operating pressures.

6.2.2 PLANT STAFF ORGANIZATION

The following manning requirements shall be met:

1. All CORE ALTERATIONS shall be directly supervised by either a Senior Reactor Operator or Senior Reactor Operator Limited to Fuel Handling who has no other concurrent responsibilities during this operation.

2. At all times when there is fuel in the reactor:
   a. A senior reactor operator shall be on the plant site.
   b. A reactor operator shall be in the control room.
   c. Two reactor operators shall be in the control room during startup, scheduled shutdown, and during recovery from trips caused by transients or emergencies.
   d. Minimum operating shift crew compositions shall conform to those shown in Table 6.2-1.
   e. At least one member of each operating shift crew shall be qualified to implement radiation protection procedures.

6.5.1.4 Meeting Frequency

The Operations Committee meet at least once per calendar month and as convened by the Operations Committee Chairman or Vice Chairman.

6.5.1.5 Quorum

A quorum of the Operations Committee shall consist of the chairman or Vice Chairman and five members including alternates.

6.5.1.6 Responsibilities

The Operations Committee shall be responsible for:

a. Review of (1) all procedures required by Specification 6.8, Plant Operating Procedures, and changes thereto, (2) any other proposed procedures or changes thereto as determined by the plant Superintendent-Nuclear to affect nuclear safety.

b. Review of all proposed tests and experiments that affect nuclear safety.

c. Review of all proposed changes to the Technical Specifications.

d. Review of all proposed changes or modifications to plant systems or equipment that affect nuclear safety.

e. Investigation of all violations of the Technical Specifications including the preparation and forwarding of reports covering evaluation and recommendations to prevent recurrence to the Vice President, Nuclear and to the Chairman of the Safety Committee.

f. Review of all Reportable Events.

g. Review of facility operations to detect potential safety hazards.

h. Performance of special reviews, investigations or analyses and reports thereon as requested by the Chairman of the Safety Committee.

i. Review of the Plant Security Plan and implementing procedures.

j. Review of the Emergency Plan and implementing procedures.

k. Review of every unplanned release of radioactivity to the environs for which a report to the NRC is required.

l. Review of changes to the Offsite Dose Assessment Manual and changes to the Process Control Program.

m. Review of the Fire Protection Program and implementing procedures.

6.5.1.7 Authority

The Operations Committee shall:

a. Recommend to the Plant Superintendent-Nuclear written approval or disapproval of items considered under Specification 6.5.1.6 (a) through (d) above.

b. Render determinations in writing with regard to whether or not each item considered under 6.5.1.6 (a) through (e) above constitutes an unreviewed safety question.

c. Provide written notification within 24 hours to the Vice President, Nuclear and the Safety Committee of disagreement between the Operations Committee and the Plant Superintendent-Nuclear; however, the Plant Superintendent-Nuclear shall have responsibility for resolution of such disagreements pursuant to Specification 6.1.1 above.

6.5.1.8 Record

The Operations Committee shall maintain written minutes of each meeting and copies shall be provided to the Vice Present, Nuclear and the Chairman of the Safety Committee.

6.5.2 Safety Committee

6.5.2.1 Function

The Safety Committee shall function to provide independent review and audit of disignated activities in the areas of:

a. Nuclear power plant operations.

b. Nuclear Engineering.

6.6 REPORTABLE EVENT ACTION

6.6.1 The following actions shall be taken for REPORTABLE EVENTS.

a. Each REPORTABLE EVENT shall be reviewed by the Operations Committee, and a report shall be submitted to the Safety Committee and the Vice President, Nuclear and

b. The Commission shall be notified and a report submitted pursuant to the requirements of Section 50.73 to 10 CFR Part 50.

6.7 ACTION TO BE TAKEN IF A SAFETY LIMIT IS EXCEEDED

6.7.1 If a safety limit is exceeded, the reactor shall be shut down and reactor operation shall only be resumed when authorized by the NRC.

6.7.2 An immediate report shall be made to the Vice President, Nuclear and the Safety Committee. The Vice President, Nuclear shall promptly report the circumstances to the NRC as specified in Subsection 6.11, Plant Reporting Requirements.

6.7.3 A complete analysis of the circumstances leading up to and resulting from the situation together with recommendations to prevent a recurrence shall be prepared by the Operations Committee. This report shall be submitted to the Vice President, Nuclear and to the Safety Committee. Appropriate analyses or reports will be submitted to the NRC by the Vice President, Nuclear as specified in Subsection 6.11, Plant Reporting Requirements.

Distribution:
Docket File 50-331
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C. Berlinger - OWF 7E4
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