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

MAINE YANKEE ATOMIC POWER COMPANY

DOCKET NO. 50-309

MAINE YANKEE ATOMIC POWER STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 114
License No. DPR-36

1. The Nuclear Regulatory Commission (the Commission or the NRC) has found that:

   A. The application for amendment filed by the Maine Yankee Atomic Power Company (the licensee) dated December 2, 1988 complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.B.6.(b) of Facility Operating License No. DPR-36 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 114 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Richard H. Wessman, Director
Project Directorate I-3
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical Specifications

Date of Issuance: November 17, 1989

ATTACHMENT TO LICENSE AMENDMENT NO. 114

FACILITY OPERATING LICENSE NO. DPR-36

DOCKET NO. 50-309

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
3	3
3.4-1	3.4-1
3.4-2	3.4-2
3.4-3	3.4-3
3.4-3a	-----
3.4-4	3.4-4
3.4-5	3.4-5
3.4-6	3.4-6
3.4-7	3.4-7
3.4-8	3.4-8
3.4-9	3.4-9
3.4-10	3.4-10
3.4-11	3.4-11
------	3.4-12*
------	3.4-13*
------	3.4-14*
------	3.4-15*

*Denotes new page

Adjusted Reference Temperature (ART)

The initial reference temperature, RT_{NDT}, of the reactor pressure vessel adjusted for the effects of irradiation and including margin for uncertainties.

Lowest Service Temperature

Reactor coolant temperature below which the system pressure must be limited to a maximum of 621 psig.

Minimum Boltup Temperature

Reactor coolant temperature below which the reactor pressure vessel head stud loads must be reduced to zero (0).

REACTOR PROTECTIVE SYSTEM

Instrument Channels

One of four independent measurement channels, complete with the sensors, sensor power supply units, amplifiers, and trip modules provided for each safety parameter.

Reactor Trip

The de-energizing of the magnetic jack holding coils which releases the shutdown and regulating control elements (CEA's) and allows them to drop into the core.

Trip Module

A bistable unit in each of the instrument channels which is tripped when the parameter signal exceeds a specified limit. The relay contact outputs of the trip modules form the reactor protective system logic.

ENGINEERED SAFEGUARDS SYSTEMS

Subsystem

One of two or more redundant grouping of sensors, logic, and circuitry able to bring about automatic or manual initiation of an engineered safeguard.

Degree of Redundancy

The difference between the number of operable channels and the number of channels which when tripped will cause an automatic system trip.

3.4 COMBINED HEATUP, COOLDOWN AND PRESSURE-TEMPERATURE LIMITATIONS

Applicability:
Applies to temperature and pressure conditions during heatup and cooldown of the reactor coolant system.

Objective:
To maintain operational limits within design boundaries of the reactor coolant system.

Specification:

A. Reactor Coolant System

1. The reactor coolant system shall be operated within the limits set forth in Table 3.4-1 and the pressure-temperature limits derived from (2) below.

   Remedial Action: If the reactor coolant system is subject to conditions outside of the above limits the reactor shall be brought subcritical and an engineering analysis of the consequences shall be made prior to restoration of power operation.

2. The pressure-temperature limits for reactor coolant system operation shall be revised at each refueling using the following procedure.

   a. The pressure-temperature limits for reactor coolant system operation shall be as developed by superimposing fluence dependent heatup and cooldown limits into the basic ASME Section 3 limits of operation (Figure 3.4-1). At each refueling the heatup and cooldown limits will be modified to account for material property changes in the reactor vessel projected through the next core cycle in accordance with the following procedure:

      1. Project the cumulative thermal generation, MWH(t), on the vessel through the next core cycle.

      2. Determine the associated fluence to the vessel from Figure 3.4-2.

      3. Determine the Adjusted Reference Temperature (ART) at the 1/4T and 3/4T from Figure 3.4-3.

      4. The heatup and cooldown limit lines at locations of interest in Figures 3.4-4 through 3.4-9 shall be shifted parallel to the temperature axis (horizontal) in the direction of increasing temperature, a distance equivalent to the Adjusted Reference Temperature (ART) at the 1/4T and 3/4T as applicable.

The following table provides the Adjusted Reference Temperature (ART) shift parameter to be applied:

CURVES	APPLICABLE FIGURES	SHIFT PARAMETER
Heatup Limits for 3/4T Location	3.4-4 & 3.4-7	3/4T ART
Heatup Limits for 1/4T Location	3.4-5 & 3.4-8	1/4T ART
Cooldown Limits for 1/4T Location	3.4-6 & 3.4-9	1/4T ART

5. Superimpose the shifted Figures 3.4-4 through 3.4-9 onto Figure 3.4-1 to provide the appropriate operational limits for heatup and cooldown during normal and hydrostatic test operations.

B. Reactor Core

1. The reactor shall not be critical if the reactor coolant pressure is less than 400 psig or greater than 2400 psig.

2. The reactor shall not be critical (other than for the purposes of low power physics tests) if the temperature of the reactor coolant is:

   a. less than 111°F plus the shift in RT_{NDT} at 1/4T (as determined in A.2.a.4), or

   b. within 40°F or less of the applicable heatup curve (as determined in A.2.a.4), or

3. The reactor shall not be critical without a steam bubble in the pressurizer.

4. The reactor shall not be critical during inservice leak or hydrostatic testing of the reactor coolant system.

C. Residual Heat Removal System

1. The residual heat removal system (RHRS) must be isolated whenever the reactor coolant system pressure exceeds 600 psig or the temperature exceeds 450°F.

D. Reactor Coolant System Low Temperature Overpressure Protection

Whenever the reactor coolant system is less than the minimum pressurization temperature plus margin and the RCS is not vented:

1. The reactor shall not be made critical.

2. The RCPs may not be started (or "jogged") unless the pressurizer level is less than 80% and the steam generator temperature is less than 100°F above the RCS temperature.

3.a. If the pressurizer level is less than 80%:

- Two power operated relief valves and their associated block valves shall be operable and set to prevent overpressure;

or

- One power operated relief valve and its associated block valve, plus two RHR spring relief valves shall be operable and set to prevent overpressure.

b. If the pressurizer level is greater than or equal to 80%, the following valves shall be operable and set to prevent overpressure:

- Two PORVs and their associated block valves, and
- One RHR spring relief valve.

c. Only one HPSI pump shall be aligned to provide charging flow and be available for HPSI service. Control switches for all the other HPSI pumps must be in the "pull-to-lock" position.

Exception: A second HPSI pump may be out of the "pull-to-lock" position for up to 5 minutes for the purpose of rotating operating equipment.

d. At RCS pressures of less than 375 psig, HPSI pump flow must be aligned only through the charging system flow restrictor.

Remedial Action: If any of the above required conditions (3a thru d) are not met, within six hours perform one of the following:

1. Restore the required condition,

or

2. Station a dedicated operator to prevent RCS overpressurization and within 72 hours place the plant in a condition where low temperature overpressure protection is not required.

Basis:

The heatup and cooldown limit curves (Figures 3.4-4 through 3.4-9) correspond to various heatup and cooldown rates for both normal and hydrostatic test operations. Cooldown limits curves are provided only for the 1/4T crack since the 1/4T crack is always governing. However, heatup limit curves are provided for both the 1/4T crack and 3/4T crack since either can be governing depending on the Adjusted Reference Temperatures (ARTs) at the 1/4T and 3/4T locations. Linear interpolation is permissible. The heatup and cooldown curves were prepared based on initial crack tip RT_{NDT}s of zero (0) degrees Fahrenheit for the reactor vessel, and include adjustments for possible errors in the pressure and temperature sensing instruments.

Basis: (Continued)

The reactor vessel materials opposite the core have been tested to Appendix G of 10CFR50 to determine their RT_{NDT}. Reactor operation and resultant fast neutron (E greater than 1 Mev) irradiation will cause an increase in RT_{NDT}. As a result of irradiation tests of actual vessel materials, and application of Regulatory Guide 1.99, Revision 2, the Adjusted Reference Temperature (ART) can be determined at the critical 1/4T and 3/4T locations from Figure 3.4-3. The actual Adjusted Reference Temperature (ART) of the vessel material will be established periodically during operation by removing and evaluating, in accordance with ASTM E185-73, reactor vessel material irradiation surveillance specimens installed near the inside wall of the reactor vessel in the core area.

The pressure-temperature limit lines shown on Figures 3.4-4 through 3.4-9 for normal operation and inservice leak/hydrostatic testing, as well as the limits on criticality have been provided to assure compliance with the requirements of Appendix G to 10CFR50. The heatup limits obtained using the procedure described in Specification 3.4.A.2 and Figures 3.4.4 and 3.4-7 may not be applicable for cumulative thermal generation greater than 5.414×10^8 MWH(t). Use of heatup limits for higher comulative thermal generation may be nonconservative. Additional restrictions on minimum reactor coolant temperature may be required to assure conservative heatup limits. The margin which is added to MPT ensures compliance by accounting for the transient influences of LTOP related heatup or cooldown boundary conditions superimposed on the RCS pressure boundary. The maximum NDTT for all reactor coolant system retaining materials, with the pressure exception of the reactor pressure vessel, has been determined to be 40°F.

The Lowest Service Temperature limit line shown on Figure 3.4-1 is based upon this NDTT since Article NB-2322 (Summer Addenda of 1972) of Section III of the ASME Boiler and Pressure Vessel Code, requires the Lowest Service Temperature to be RT_{NDT} + 100°F for piping, pumps and valves. In addition, a 60°F margin is added to this for conservatism. Below this temperature, the system pressure must be limited to a maximum of 25% of this system's design pressure of 2485 psig (20% of the preoperational hydro-test pressure of 3125 psig).

The minimum boltup temperature is established to comply with the manufacturer's specification for tensioning the reactor pressure vessel head. The temperature provided in Table 3.4-1 corresponds to the measured 20°F NDTT of the reactor pressure vessel flange, which is not subject to radiation damage, plus 60°F data scatter in NDT measurements. No correction for instrumentation error is included in the limit in Figure 3.4-1 since an adequate degree of conservatism is already applied.

The limitations imposed on the pressurizer heatup and cooldown rates and spray water temperature differential are provided to assure that the pressurizer is operated within the design criteria assumed for the fatigue analysis performed in accordance with the ASME Code requirements.

Remedial Action 2 to Specification D.3 requires stationing a dedicated operator. This operator shall be stationed at the main control board and protect against RCS overpressurization.

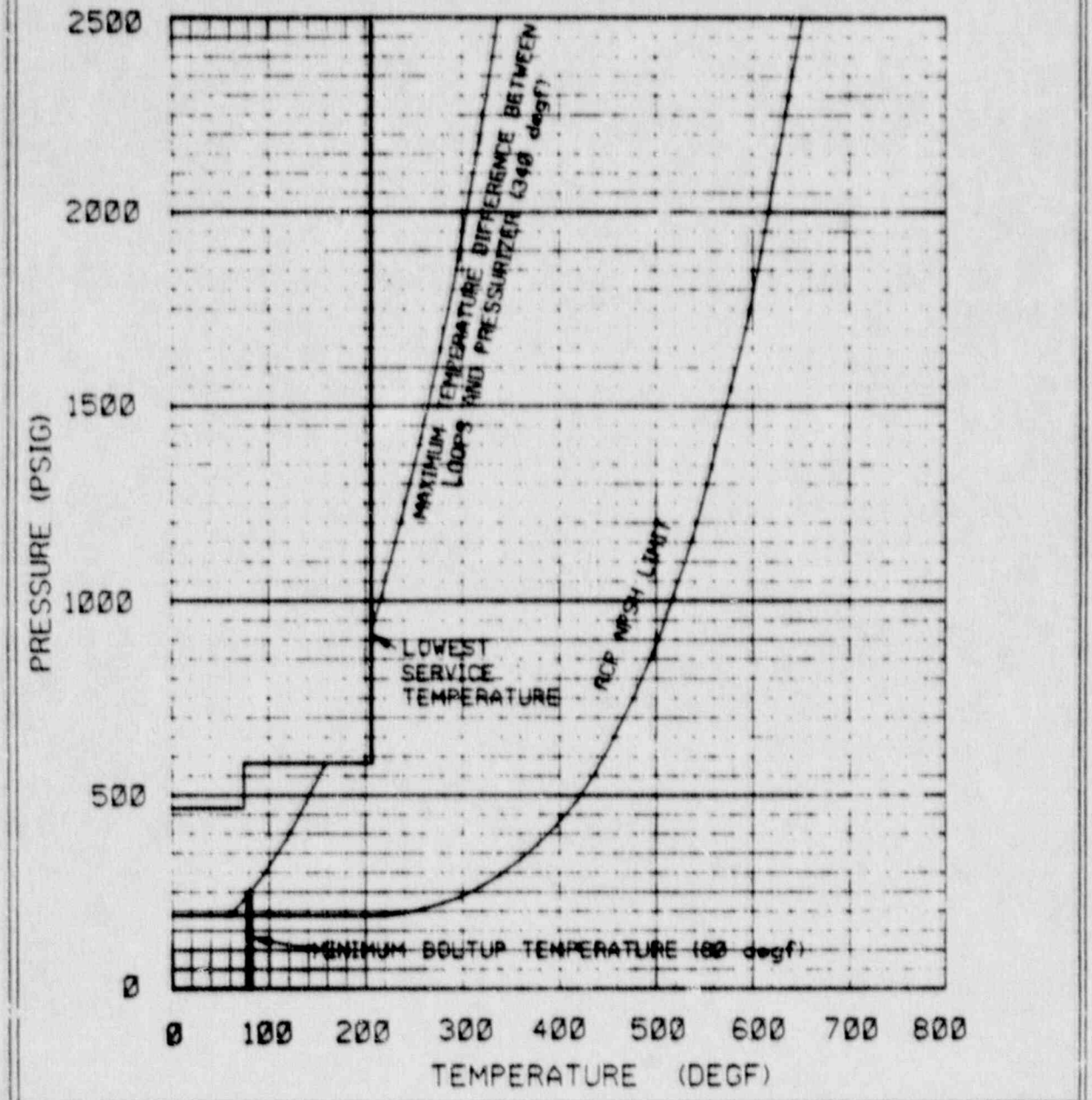
The PORVs in the variable pressure setpoint relief (VPSR) mode, in combination with the RHR safety valves when the pressurizer level exceeds 80%, constitute the LTOP pressure relief system. The charging system flow restrictor provides additional LTOP protection from an inadvertent HPSI pump injection transient. Use of this system provides protection of the 10 CFR 50 Appendix G limits when operating at low temperatures.

TABLE 3.4.1

LIMITS OF OPERATION FOR THE REACTOR COOLANT SYSTEM

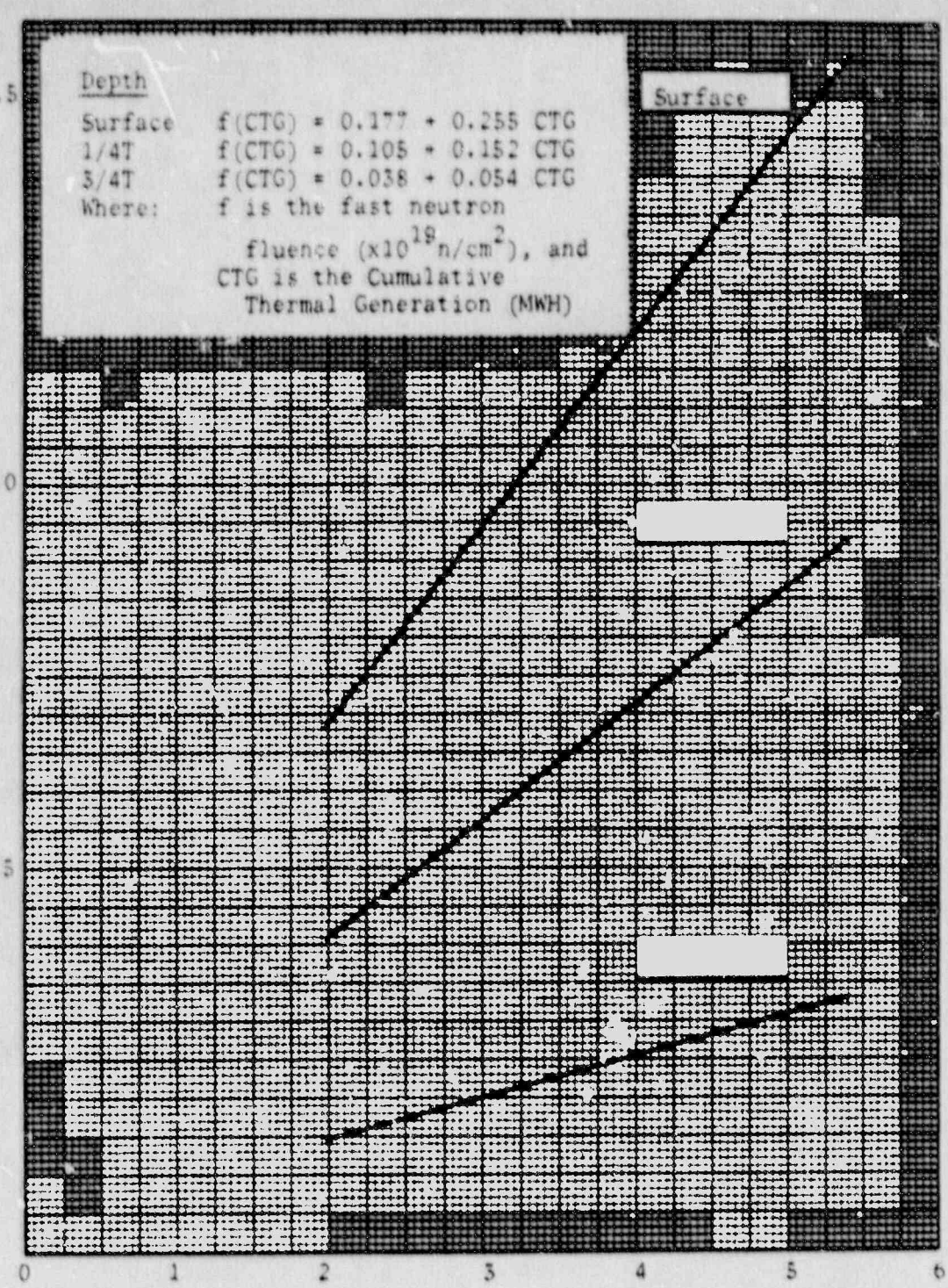
			STEAM GENERATOR	
Limit	Reactor Vessel	Pressurizer	Primary Side	Secondary Side
Maximum Heatup Rate (°F in any one-hour period)	100	100	100	--
Maximum Cooldown Rate (°F in any one-hour period)	100	200	100	--
Lowest Service Temperature	200	70	70	100
Maximum Pressure Below Lowest Service Temperature	621	500	500	230
Minimum Boltup Temperature (°F)	80	--	--	--
Maximum Temperature Difference Between Operating Loops and Pressurizer (°F)	--	340	--	--

Amendment No. 37, 88, 88, 114

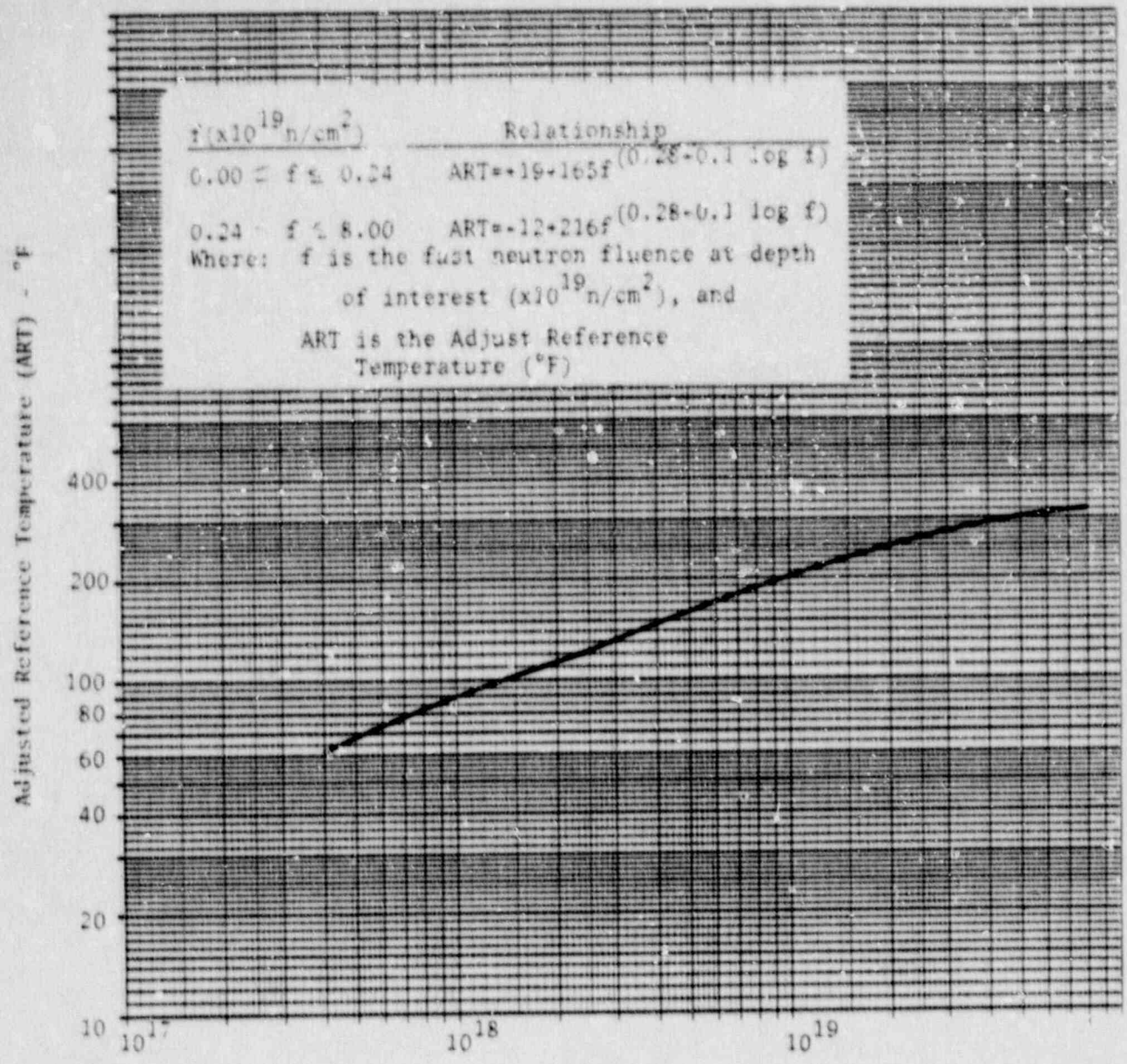


MAINE YANKEE TECHNICAL SPECIFICATION	REACTOR COOLANT SYSTEM MAXIMUM LIMITS OF OPERATION	FIGURE 3.4-1

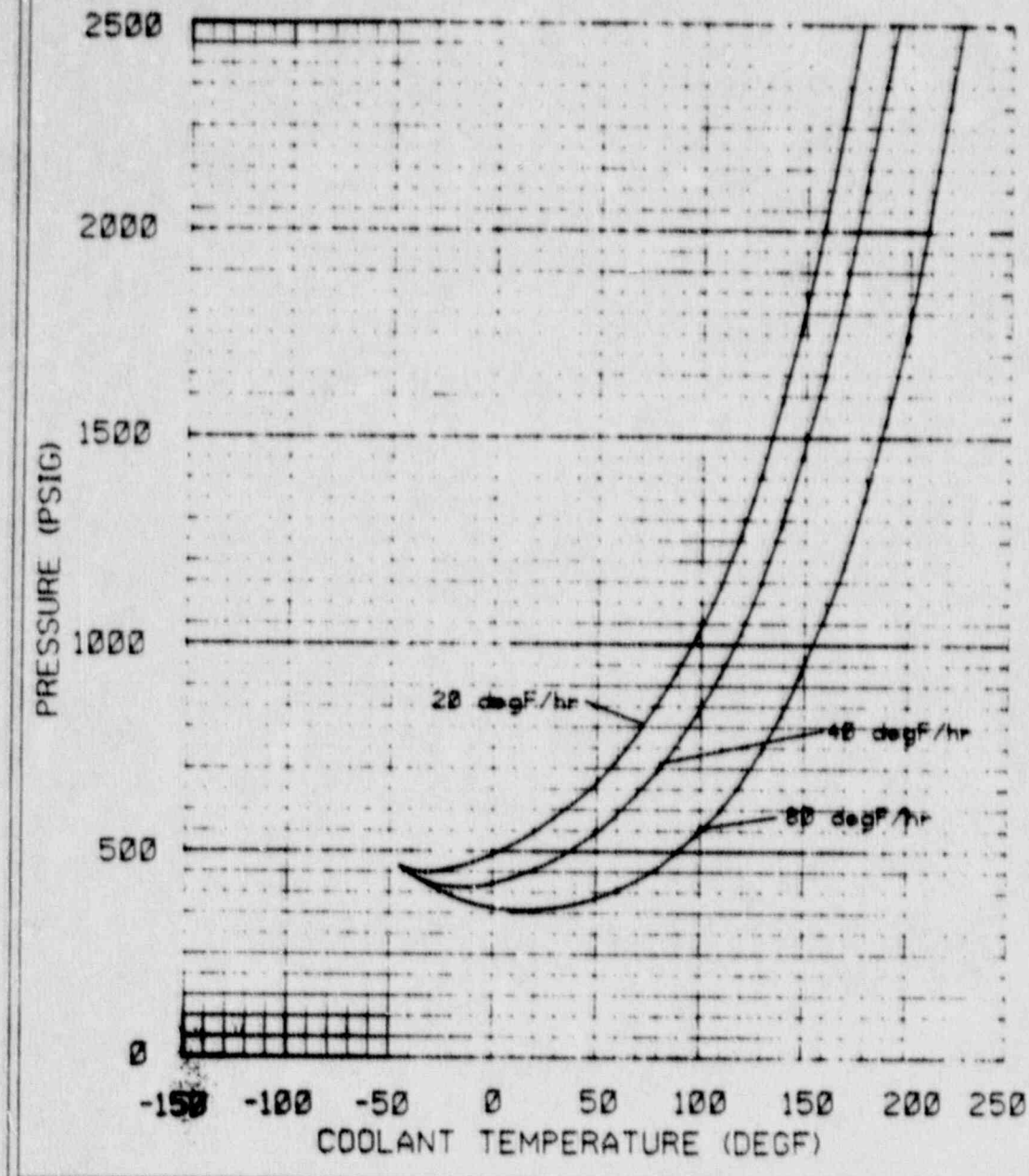
/usr/david/mpt/mptcurve.dgn



MAINE YANKEE Technical Specification	Reactor Pressure Vessel Fast Neutron Fluence (E greater than 1.0 Mev) Versus Cumulative Thermal Generation (CTG) for Inside Surface, 1/4T and 3/4T Depth	Figure 3.4-2

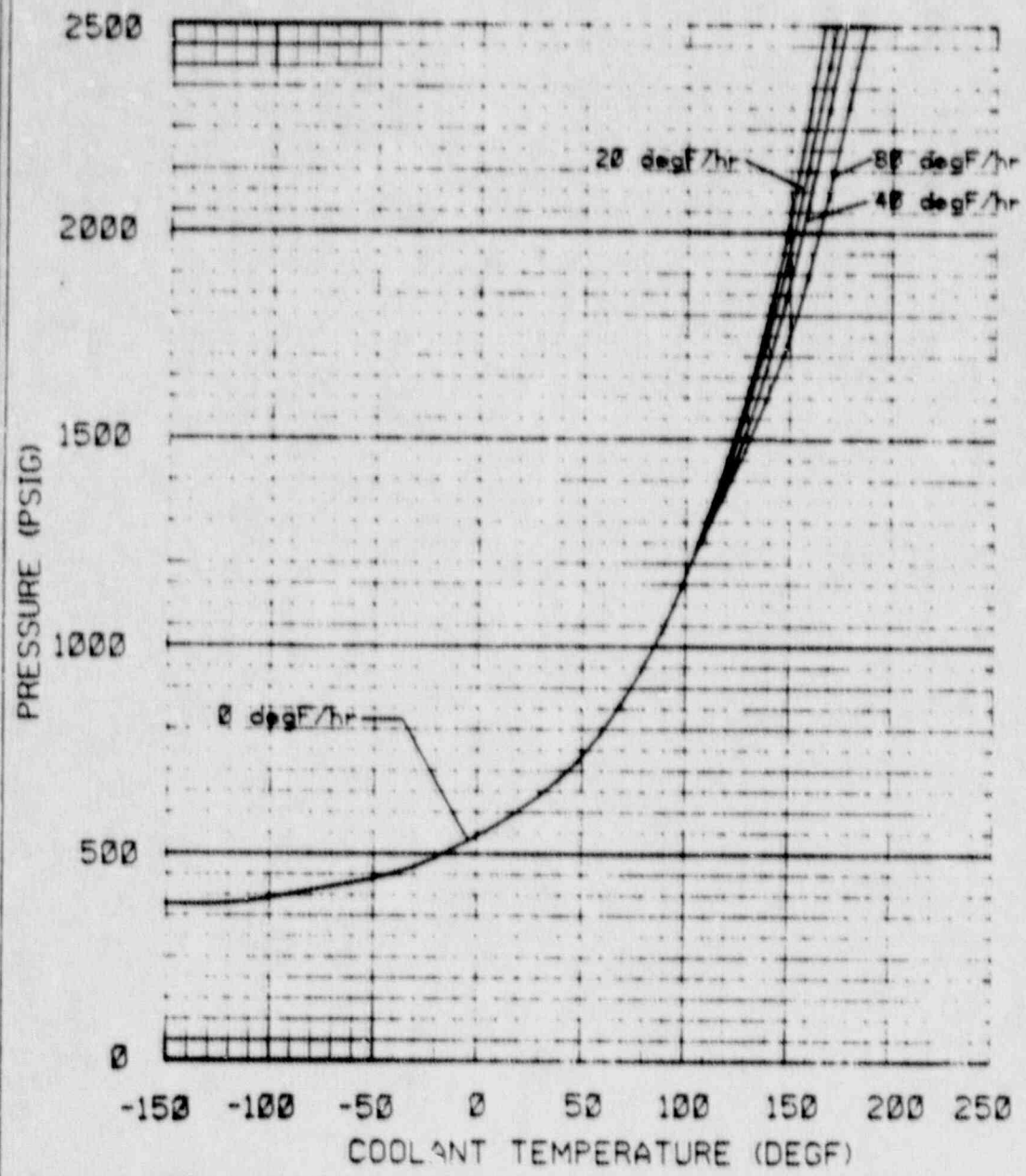


Maine Yankee Technical Specification	Adjusted Reference Temperature (ART) Versus Fast Neutron Fluence (E greater than 1.0 Mev)	Figure 3.4-5



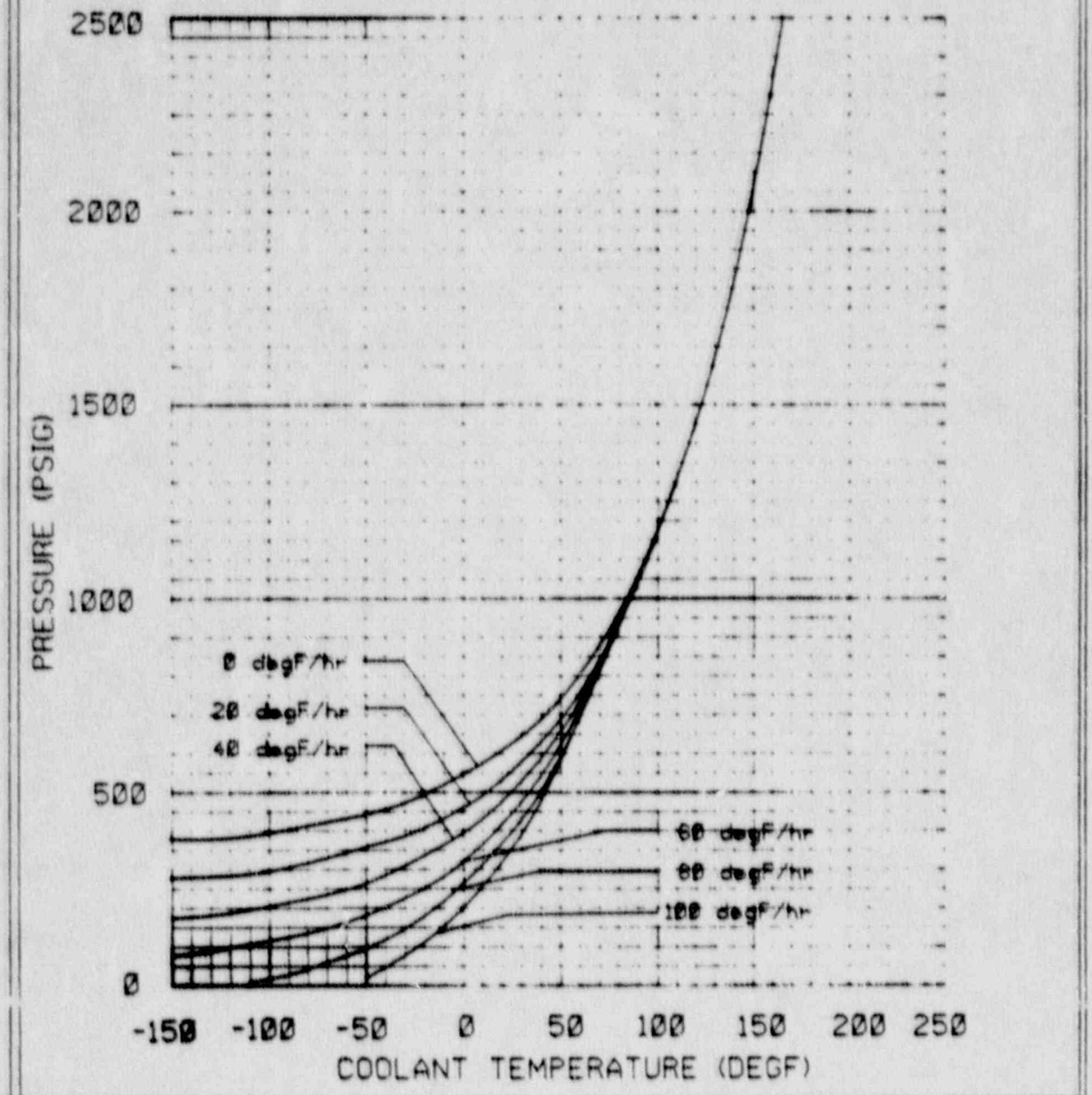
MAINE YANKEE TECHNICAL SPECIFICATION	HEATUP LIMITS FOR 3/4T LOCATION NORMAL OPERATION VERSUS COOLANT TEMPERATURE (Adjusted Reference Temperature = 0 degf)	FIGURE 3.4-4

/usr/david/spt/htup2.dgn



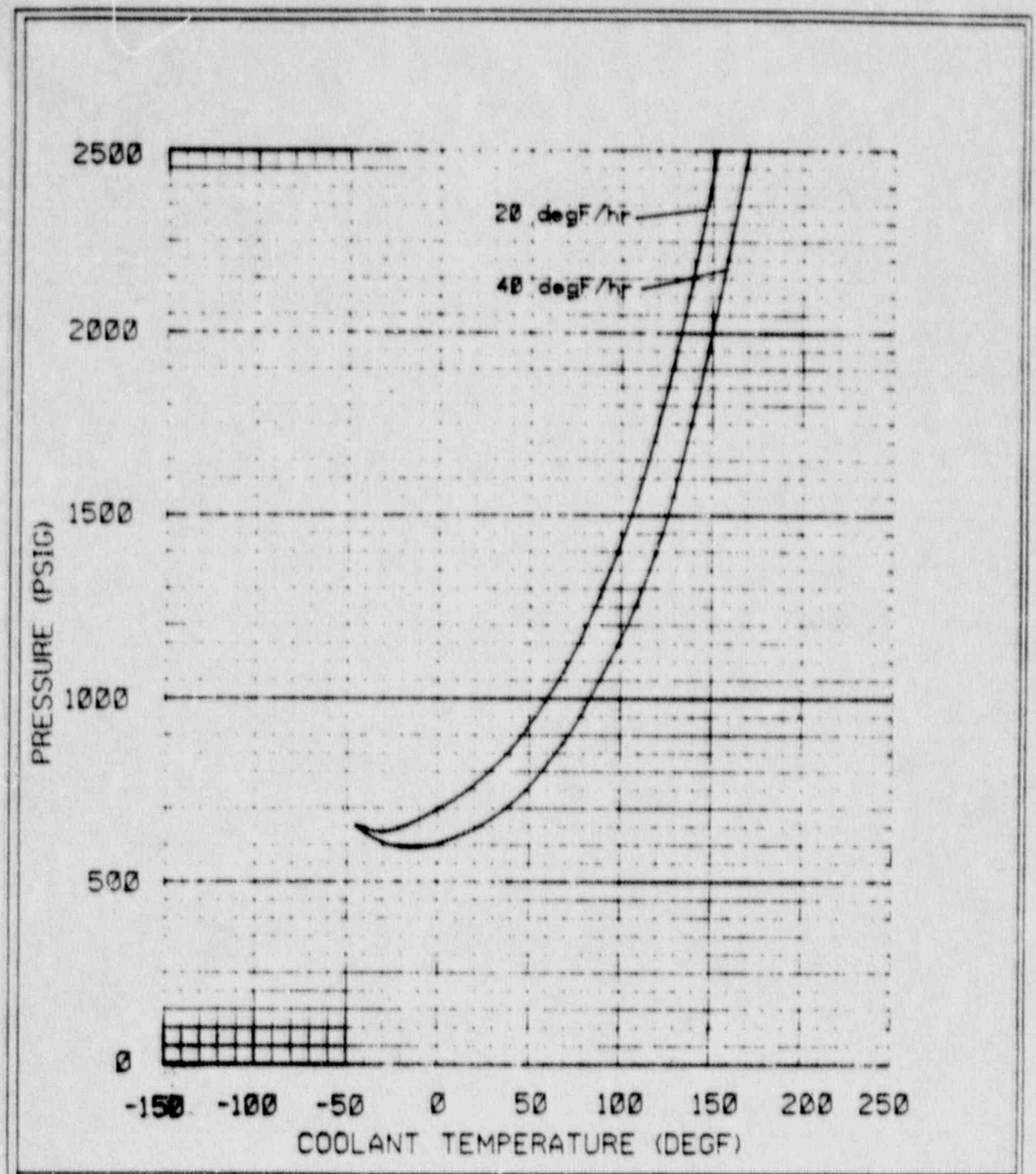
MAINE YANKEE TECHNICAL SPECIFICATION	HEATUP LIMITS FOR 1/4T LOCATION NORMAL OPERATION VERSUS COOLANT TEMPERATURE (Adjusted Reference Temperature = 0 degf)	FIGURE 3.4-5

/usr/david/mpt/htupi.dgn



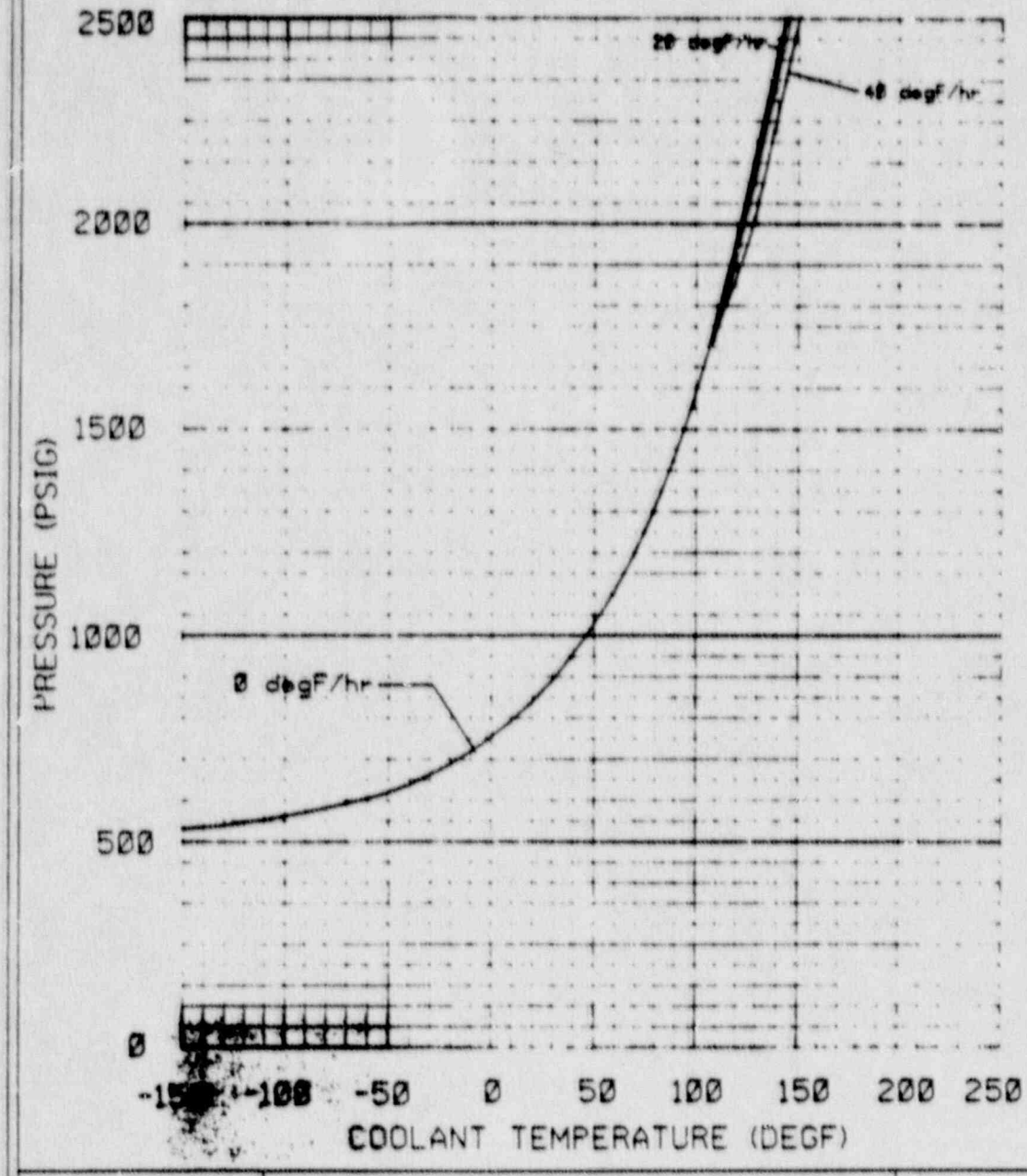
MAINE YANKEE TECHNICAL SPECIFICATION	COOLDOWN LIMITS FOR 1/4T LOCATION NORMAL OPERATION VERSUS COOLANT TEMPERATURE (Adjusted Reference Temperature = 0 degf)	FIGURE 3.4-6

/usr/david/spt/cooldown.dgn



MAINE YANKEE TECHNICAL SPECIFICATION	HEATUP LIMIT FOR 3/4T LOCATION HYDROSTATIC TESTS VERSUS COOLANT TEMPERATURE (Adjusted Reference Temperature = 0 degf)	FIGURE 3.4-7

/usr/david/mpt/htup4.dgn



MAINE YANKEE TECHNICAL SPECIFICATION	HEATUP LIMITS FOR 1/4T LOCATION HYDROSTATIC TESTS VERSUS COOLANT TEMPERATURE (Adjusted Reference Temperature = 0 degf)	FIGURE 3.4-8

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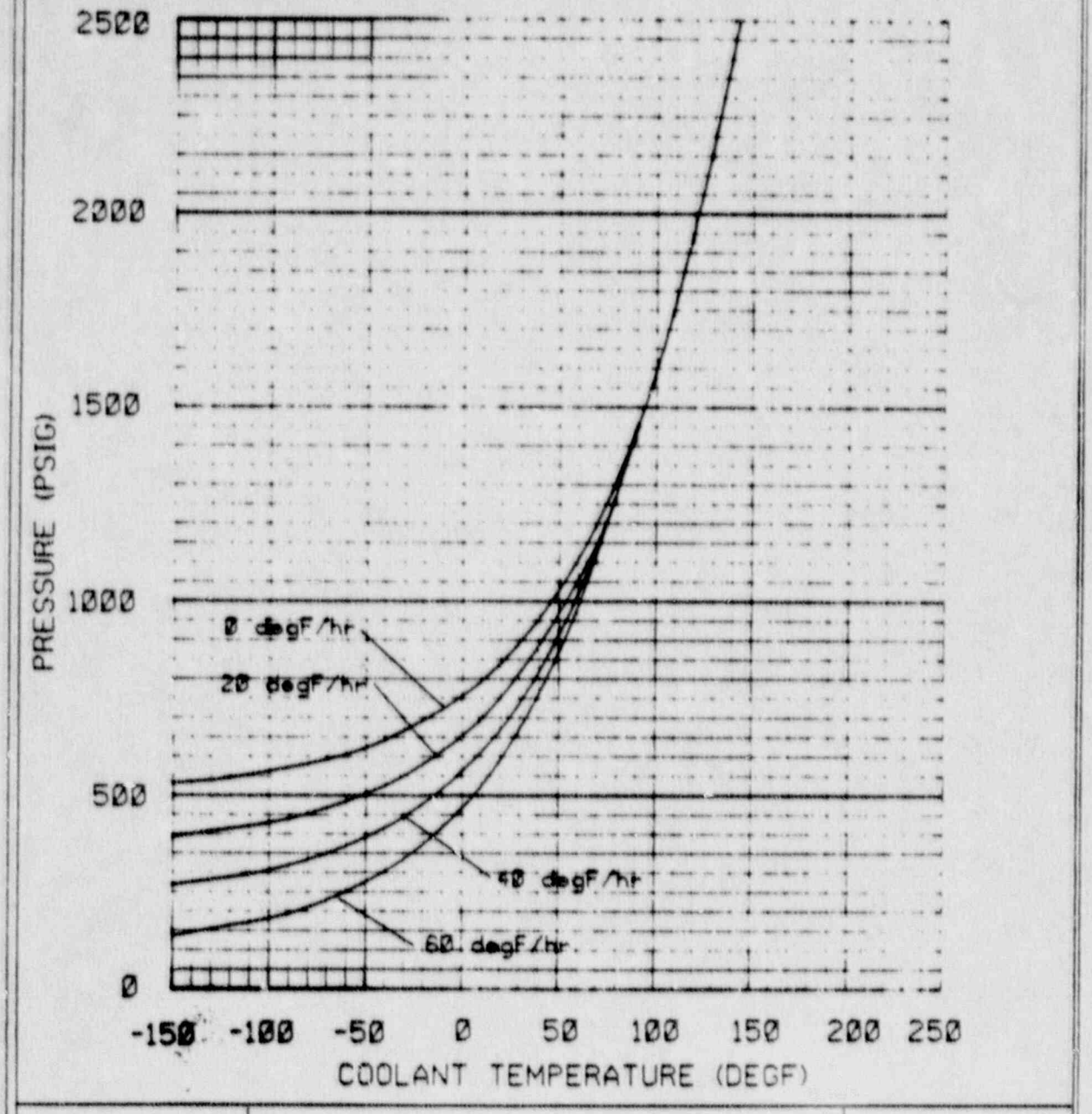

MAINE YANKEE TECHNICAL SPECIFICATION	COOLDOWN LIMITS FOR 1/4T LOCATION HYDROSTATIC TESTS VERSUS COOLANT TEMPERATURE (Adjusted Reference Temperature = 0 degf)	FIGURE 3.4-9

/usr/david/mpt/cooldwn1.dgn