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HL-1359
000127

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U.S. Nuclear Regulatory Commission
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PLANT HATCH - UNITS 1, 2
NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
REQUEST FOR ADDITIONAL INFORMATION:
SUPPRESSION POOL TEMPERATURE MONITORING

Gentlemen:

On January 26, 1990, Georgia Power Company (GPC) submitted a proposed Technical Specifications (TS) change addressing suppression pool temperature monitoring. The proposed change was submitted to ensure all temperature sensors in the suppression pool would be used to establish average or bulk pool temperature. The January 26, 1990 submittal also served to docket GPC's method of average pool temperature determination, and provide preplanned alternate methods of temperature monitoring in the event temperature elements become inoperable.

The NRC staff has verbally indicated concurrence with GPC's preferred method of obtaining the average or bulk temperature used to show compliance with TS operational limits. However, during phone conversations on August 17, September 24, and October 19, 1990, the Staff requested GPC amend portions of the preplanned alternate methods described in the proposed Unit 1 and Unit 2 TS Bases included in the January 26 submittal.

Enclosure 1 to this letter details the revised preplanned methods to be used in monitoring suppression pool temperature should temperature elements become inoperable. Enclosure 2 provides the page change instructions for inserting the revised Unit 1 and Unit 2 TS Bases pages describing the preplanned alternate methods. The revised Bases pages follow Enclosure 2. We have reviewed the original 10 CFR 50.92 evaluation included in GPC's January 26, 1990 submittal against the enclosed changes and determined it remains valid; therefore, no certification is required.

Please contact this office if you have questions.

Sincerely,

W. G. Hairston, III

W. G. Hairston, III

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GKM/eb
c: (See next page.)

Georgia Power

Enclosures:
1. Preplanned Alternate Methods for Suppression Pool Temperature Monitoring
2. Technical Specifications Bases Page Change Instructions

c: Georgia Power Company
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ENCLOSURE 1

PLANT HATCH - UNITS 1, 2
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REQUEST FOR ADDITIONAL INFORMATION:
PREPLANNED ALTERNATE METHODS FOR
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Background

Each suppression pool at Plant Hatch has 4 temperature elements, T48-N009A-D (referred to as the N009 Series), installed in the lower elevation and 11 temperature elements, T48-N301 through N311 (referred to as the N300 Series), installed in the upper elevation. Georgia Power Company's (GPC's) preferred method of complying with Technical Specifications (TS) temperature limits is the use of a weighted average of the combined 15 temperature elements. This method provides a relatively accurate indication of bulk pool temperature which is usually monitored using the Safety Parameter Display System (SPDS), or by manually averaging the output of control room temperature recorders. However, all upper pool temperature elements (N300 Series) feed into a single-point recorder and are not single-failure proof. Also, Plant Hatch's SPDS is neither single-failure proof nor subject to TS requirements for operability. Therefore, it is prudent to define preplanned alternate methods of temperature monitoring when more than two of the upper pool temperature elements are inoperable.

Data Compilation

In order to define acceptable alternate methods of suppression pool temperature monitoring in the event upper elevation temperature elements (N300) become inoperable, the following actions were taken:

1. A special-purpose procedure was written to facilitate the recording of detailed suppression pool temperature data for Unit 1 and Unit 2 during the late spring and summer of 1989.

2. Several hundred surveillance data packages representing periods of normal operation without suppression pool cooling (SPC), normal operation with SPC, and testing of the High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) Systems were reviewed.

Data Analysis

The conclusions drawn from the review of the surveillance data packages are as follows:

1. During normal plant operation, when the suppression pool water is not being circulated, thermal stratification may cause slight differences

in temperature in the upper and lower regions of the pool. A 5°F adder to the average of the operable N009 Series elements is sufficiently conservative to account for the stratification in the suppression pool during normal operation without SPC. The largest temperature differential observed in either unit during normal operation without SPC was approximately 3.5°F, with the average being about 2°F.

2. The 5°F adder is not necessary when at least one RHR pump is in the SPC mode and HPCI testing is not in progress. RHR pump suction and discharge flow result in effective thermal mixing during normal operation, testing of safety-relief valves (SRVs), or testing of the RCIC System.

   During normal operation, the temperature differential between the average of the N009 Series elements and the bulk pool temperature is on the order of 1°F or less. SRV testing is very brief (a few seconds or less per valve), and pool heatup/stratification is not significant. During RCIC testing, the relatively low steam discharge mass flux (as compared to HPCI), in conjunction with the RHR System, can effectively minimize stratification. Figure 1, Pool Temperature During RCIC Testing, illustrates this point.

   No specific data addressing plant operation with leaking SRVs were available. A leaking SRV is defined as an SRV experiencing significant steam leakage past the valve seat where the steam is not condensed in the SRV discharge line, and steam expulsion into the suppression pool occurs. Although thermal stratification in the suppression pool may increase, use of RHR in the SPC mode would minimize the effects because of the low steam mass flux.

3. The HPCI System has approximately 10 times the steam flow of the RCIC System; therefore, during HPCI testing, thermal stratification may be significant. The N009 Series (lower elevation) sensors may not respond as quickly as the upper temperature sensors (N300 Series) and the N009 Series sensors alone may not give an accurate reading of bulk pool temperature. Figure 2, Pool Temperature During HPCI Testing, illustrates this point.

Pre-Planned Alternate Methods

Based on conclusions drawn from the data review described above, the following alternative methods of suppression pool temperature monitoring (Table 1) will be employed if more than 2 of the 11 N300 Series sensors are inoperable.

ENCLOSURE 1 (Continued)

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PREPLANNED ALTERNATE METHODS FOR
SUPPRESSION POOL TEMPERATURE MONITORING

TABLE 1

Plant Condition*	Correction Factor (°F) to Operable N009A-D Elements
(a) Normal Operation; Torus cooling not operating (Note 1); no HPCI testing (Note 2); no leaking SRV(s) (Note 3)	5
(b) Normal Operation; With or w/o torus cooling operating; HPCI testing; with or w/o leaking SRV(s)	See Figure 3
(c) Normal Operation; Torus cooling operating; no HPCI testing; with or w/o leaking SRV(s)	0
(d) Abnormal Operation; With or w/o torus cooling operating; significant heat addition to suppression pool	High N009 element if SPDS is inoperable

*NOTES:

1. Torus cooling is at least one loop of RHR in the SPC or torus spray mode.

2. The TS limit for this condition is 105°F.

3. A leaking SRV is defined as an SRV experiencing significant steam leakage past the seat. All the steam is not condensed in the SRV discharge line, and, therefore, results in steam expulsion into the suppression pool.

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Figure 3, Permissible Run Time for HPCI Versus Initial Pool Temperature, is based on the observed heatup during testing and analytical calculations of bulk temperature increase. Since the RHR System is aligned in the SPC mode prior to running HPCI, an accurate bulk temperature measurement may be obtained prior to starting the test using only the lower pool temperature elements (N009 Series), if necessary. Plant personnel will continue to record the pool temperature every 5 minutes, as instructed by the TS; however, run time will be administratively limited when upper pool temperature indication is not available (i.e., more than 2 of the 11 N300 Series sensors are inoperable).

The preplanned alternate methods during plant conditions (a), (b), and (c) (Table 1) should ensure accurate and conservative suppression pool temperature monitoring during normal operation, even without upper pool temperature indication. Plant conditions are controlled, and the suppression pool temperature either changes slowly, or predictably in the case of HPCI testing. Therefore, prior to any postulated accident or transient, the suppression pool temperature can be assured to be within limits. The preplanned alternate methods are not intended to cover the unlikely event of accident/transient conditions with upper pool temperature indication not available. In these cases, pool heatup will depend on the type of event transpiring. Burdening the operator with complicated averaging schemes or bounding adders is impractical and undesirable. The probability of the occurrence of an event that taxes the heat capacity of the suppression pool, combined with the loss of upper temperature indication, is very remote. However, coping with unlikely scenarios in the Emergency Operating Procedures (EPOs) can present a problem relative to operator training in the Plant Hatch simulator. Postulating these limiting scenarios with concurrent loss of the SPDS could place the operator in a no-win situation during a rapidly developing event in which suppression pool temperature is a critical parameter. Therefore, GPC believes allowing use of the temperature indication most readily available to the operator in the Control Room, which would be the N009 Series elements on the control room recorder, is appropriate, considering the likelihood of an abnormal situation involving loss of the upper-level suppression pool temperature elements and the potential need for rapid decision making based on suppression pool temperature.

FIGURE 1

POOL TEMPERATURE DURING RCIC TESTING

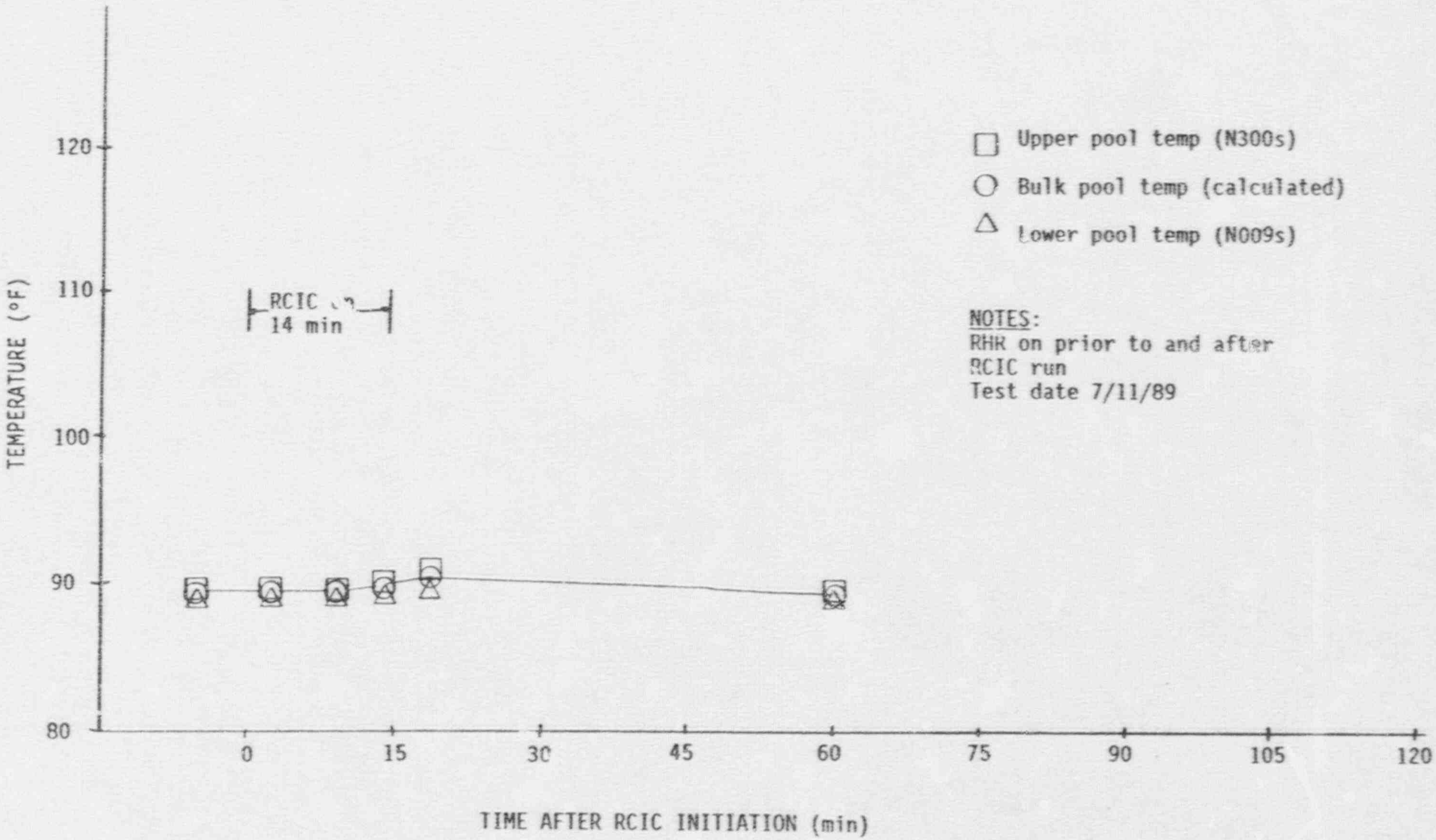


FIGURE 2

POOL TEMPERATURE DURING HPCI TESTING

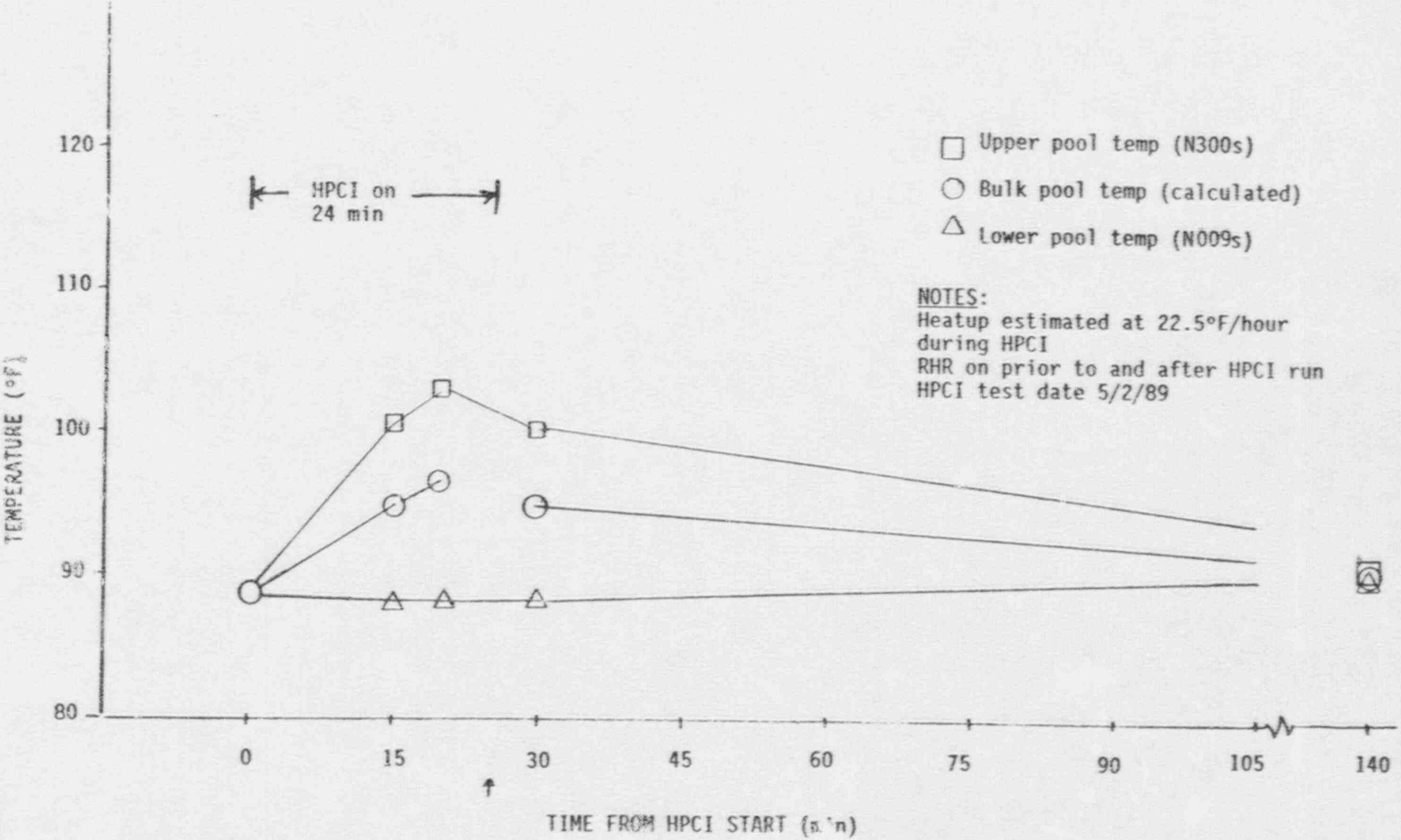
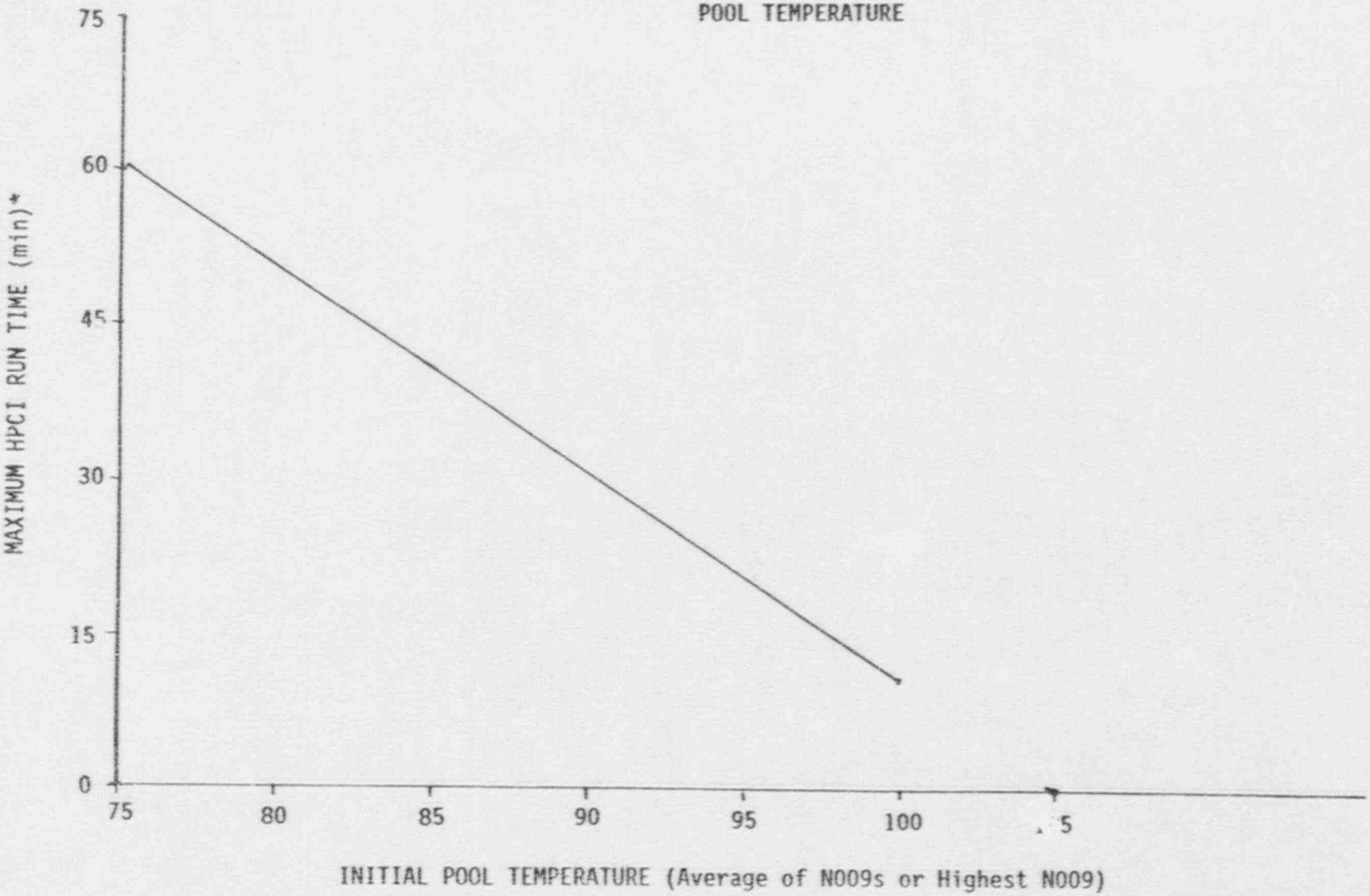


FIGURE 3

PERMISSIBLE HPCI RUN TIME VS INITIAL SUPPRESSION POOL TEMPERATURE



*Assumes 30°F/hour rise in bu[illegible] pool temp with HPCI/RHR in operation.