

CONTAINMENT INTERNAL PRESSURE CAPACITY
D.C. COOK NUCLEAR GENERATING STATION
PHASE II - PROBABILISTIC EVALUATION

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE OF REPORT

The object of this report is to develop a probabilistic description of the ultimate internal pressure capacity of the containment structures at the D.C. Cook Nuclear Generating Units 1 and 2 in order to measure the anticipated degree of dispersion which might be anticipated in the calculated results. In Phase I of this project (SMA-1981), an evaluation of the containment under static internal pressure was performed; based on three different assumed stress levels, based on specified minimum, lowest sample value and mean sample value of the material. The evaluation identified the design limiting sections of the reinforced concrete right circular cylinder, hemispherical dome, flat slab base mat and major containment penetrations viz., the equipment and personnel hatches. A linear elastic analysis of these critical portions of the containment structure was performed to assess the limiting internal pressure. The purpose of Phase II effort reported herein is to estimate the median ultimate pressure capacity of the containment using the results of the elastic analysis; the inelastic safety margin present beyond the initial yield of the materials is estimated on the basis of available data on inelastic behavior supplemented with engineering judgment. In addition to this median value, the variability in the ultimate pressure capacity is assessed. The failure modes considered in this study are those limiting modes identified in the Phase I effort: shear failure in base mat, membrane hoop tension failure of concrete cylinder, bending failure of equipment hatch, and bending failure of personnel hatch.

1.2 RESULTS

The median limiting pressure capacity of the containment is estimated to be 57.8 psi. The pressure capacity that is exceeded with 95 percent frequency considering only the inherent randomness about the median is 46.0 psi. The pressure capacity that is exceeded with 95 percent frequency at 95 percent confidence considering both the inherent randomness about the median and the uncertainty in the median itself is 36.0 psi. Figure 1 displays the entire range of the fragility curves; herein, the fragility is defined as the cumulative failure frequency at any specified internal pressure.



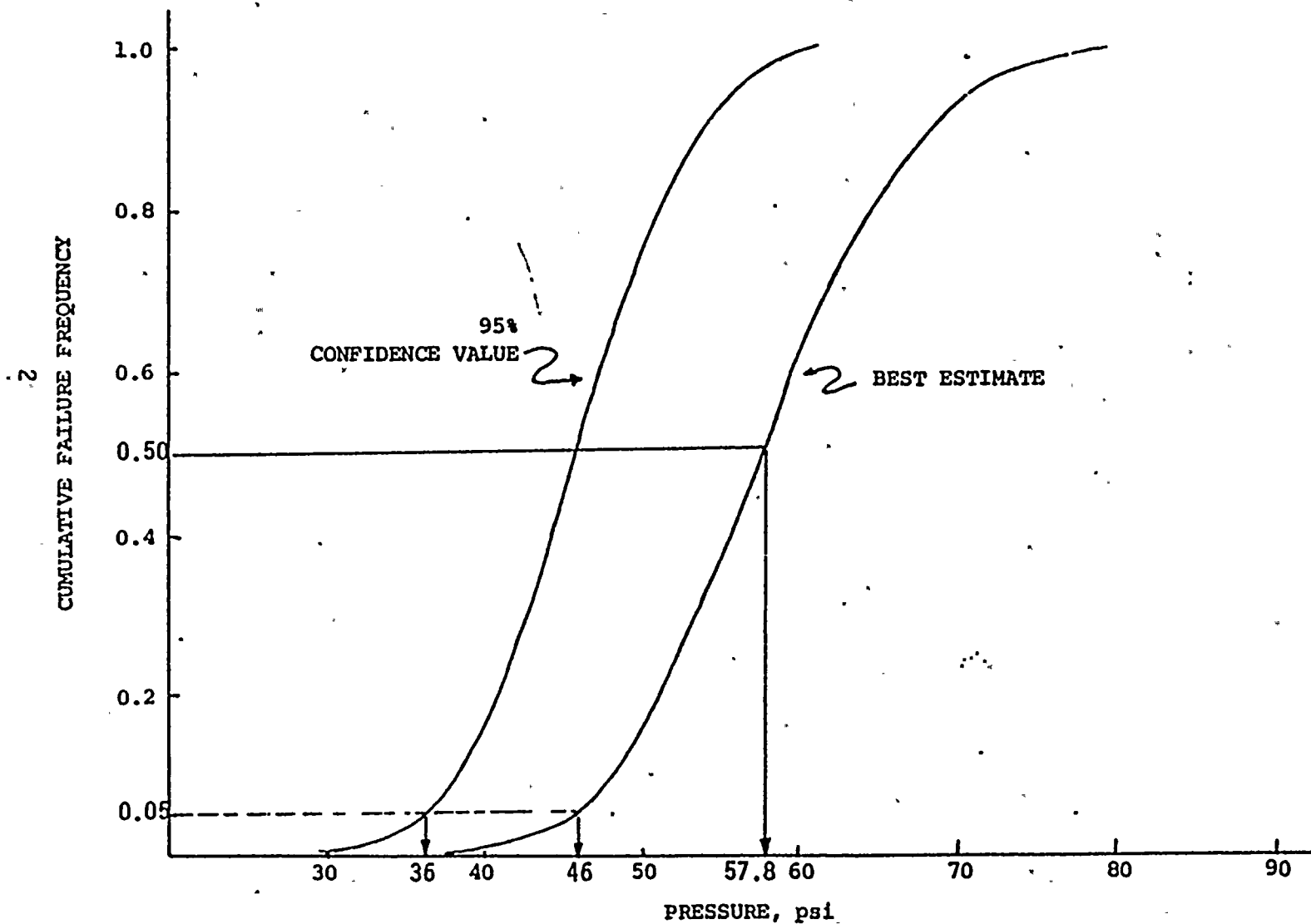


FIGURE 1. CONTAINMENT FRAGILITY FOR OVERPRESSURE



The above results can be expressed in terms of the factors of safety where the factors of safety are defined as the ratio of calculated limiting pressure to the design pressure. The design pressure for the containment is 12.0 psi. Therefore, the median factor of safety against failure from internal pressure is 4.8; the factor of safety that is exceeded with 95 percent frequency at 95 percent confidence is 3.0.

These estimates are applicable to the containments in both Units 1 and 2. The differences observed in the material strength test data between the two units are not significant enough to change the fragility curve.



2.0 METHODOLOGY

2.1 FRAGILITY MODEL

The ultimate pressure capacity of the containment is a random variable because of the variability in mechanical properties of materials (concrete, reinforcing steel, liner plate, etc.), differences between the as-built and design conditions and of a lack of knowledge of the actual mode of failure and capacity. The cumulative frequency or probability that the capacity is less than a specified pressure is known as "fragility". Curve A in Figure 2 is a fragility curve giving the cumulative frequencies for different pressures. Such a fragility curve will contain a lot of uncertainty; it is essential for a complete probabilistic description to consistently treat this uncertainty (Kennedy, et al 1980).

The entire fragility curve and the uncertainty in that curve can be expressed in terms of the median ultimate pressure capacity, \bar{p} , times the product of two random variables. Thus, the ultimate pressure capacity, p , is given by

$$p = \bar{p} \epsilon_R \epsilon_U \quad (2-1)$$

in which ϵ_R and ϵ_U are random variables with unit medians. They represent, respectively, the inherent randomness (frequency) about the median \bar{p} and the uncertainty in \bar{p} . Equation 2-1 enables the fragility curve and its uncertainty to be represented as a set of shifted curves with attached uncertainty levels (curves B, C and D in Figure 2). It is assumed that all uncertainty in the fragility curves can be expressed through uncertainty in its median alone.

The random variables ϵ_R and ϵ_U are assumed to be lognormally distributed with logarithmic standard deviation of β_R and β_U , respectively. The advantages of this formulation are:

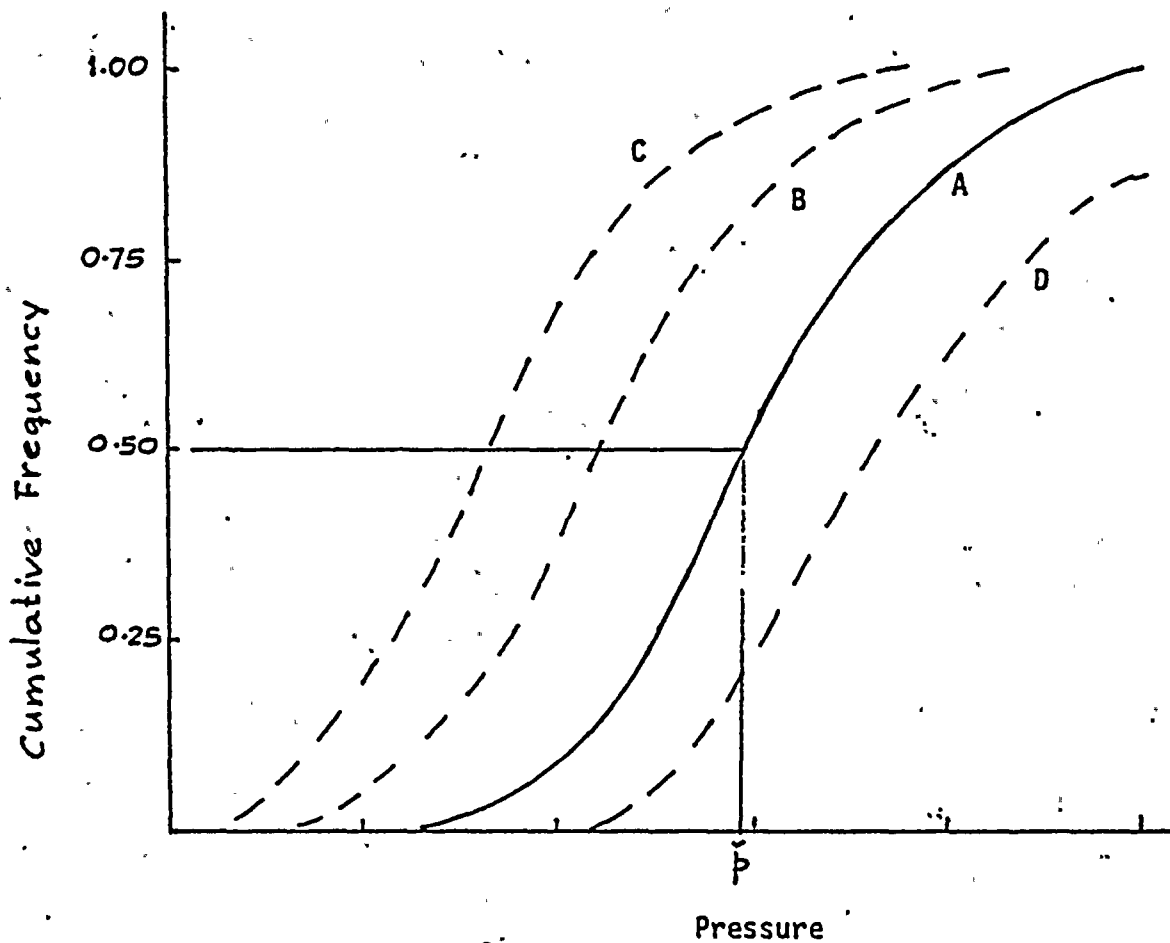


FIGURE 2. FRAGILITY CURVES FOR DIFFERENT UNCERTAINTY LEVELS

1) The entire fragility curve and its uncertainty can be expressed by only three parameters - μ , σ and μ . With the generally limited data available on fragility, it is much easier (and more reliable) to have to estimate only three parameters rather than the entire shape of the fragility curve and its uncertainty.

2) The formulation in Equation 2-1 and the lognormal distribution are very tractable mathematically.

3) The lognormal distribution which does not permit negative values and demonstrates a skew positive distribution has the same shape as the material test data on which the limiting load capacity of this analysis is based.

The lognormal distribution therefore is a reasonable distribution for use except in the extreme tails of the distribution. In addition, the central limit theorem states that a distribution of a random variable consisting of products and quotients of several variables tends to be lognormal even if the individual variables are not lognormally distributed. Use of the lognormal distribution for estimating frequencies of failure in excess of one percent is considered to be quite reasonable.

With perfect knowledge (i.e., only accounting for the random variability, σ), the frequency of failure p_f for a given internal pressure p' is expressed by:

$$p_f = \Phi \left(\frac{\ln(p'/\bar{p})}{\sigma_R} \right) \quad (2-2)$$

where Φ is the standard Gaussian cumulative distribution function. Then, with perfect knowledge (no uncertainty in the frequencies), the pressure capacity corresponding to a given frequency p'_f is given by inverting Equation 2-2

$$p' = \bar{p} \exp \left[\sigma_R \Phi^{-1}(p'_f) \right] \quad (2-3)$$

The uncertainty in the pressure capacity corresponding to a given frequency of failure as a result of uncertainty of the median capacity can then be expressed by the following probability statement:

$$P[p < p'' | p_f'] = \Phi \left[\frac{\ln(p''/p_f')}{\beta_U} \right] \quad (2-4)$$

Equation 2-4 represents the probability that the pressure capacity p is less than p'' for a given failure frequency p_f' . We are also interested in the probability that the frequency of failure p_f is larger than p_f' for a given pressure capacity p'' , i.e., $P[p_f > p_f' | p'']$. These two probabilities are shown shaded in Figure 3.

It follows that

$$P[p_f > p_f' | p''] = P[p < p'' | p_f'] \quad (2-5)$$

using Equations 2-3 and 2-4, we can write

$$P[p_f > p_f' | p''] = \Phi \left[\frac{\ln \left\{ p'' / \left(\bar{p} \exp[\beta_R \Phi^{-1}(p_f')] \right) \right\}}{\beta_U} \right] \quad (2-6)$$

Equation 2-6 is a statement on the confidence in the failure frequency prediction; it gives the probability that the failure frequency exceeds the predicted frequency p_f' corresponding to a given internal pressure p'' . Obviously, the intent of the pressure capacity estimation is to maintain this probability within an acceptable level (α), i.e., if $\alpha = 5$ percent, there is a 95 percent probability or confidence that the actual failure frequency will not be larger than the calculated failure frequency for a given internal pressure.

By setting the left side of Equation 2-6 equal to α , we get

$$\Phi \left[\frac{\ln \left\{ p'' / \left(\bar{p} \exp[\beta_R \Phi^{-1}(p_f')] \right) \right\}}{\beta_U} \right] = \alpha \quad (2-7)$$

CUMULATIVE FAILURE FREQUENCY

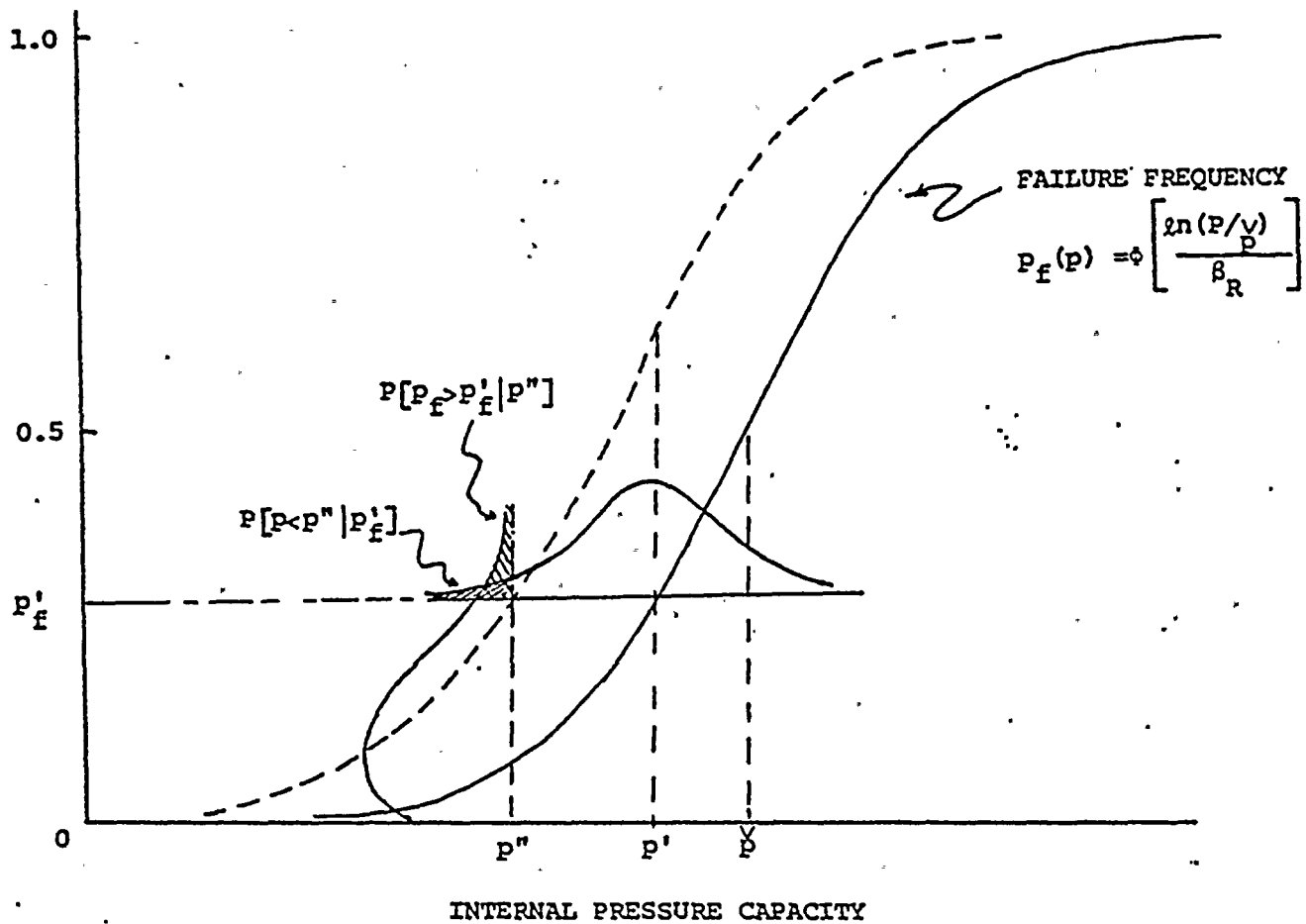


FIGURE 3. RELATIONSHIP BETWEEN UNCERTAINTY IN PRESSURE CAPACITY FOR A GIVEN FAILURE FREQUENCY AND UNCERTAINTY IN FAILURE FREQUENCY FOR A GIVEN PRESSURE CAPACITY

Solving for p_f'

$$p_f' = \phi \left[\frac{\ln(p''/p) - \beta_U \phi^{-1}(\alpha)}{\beta_R} \right] \quad (2-8)$$

Equation 2-2 gives the fragility curve as a result of inherent randomness only assuming perfect knowledge. Equation 2-8 gives the fragility curve which combines the underlying randomness and uncertainty to provide a confidence of $(1-\alpha)$. The fragility curves are developed by assuming different values of p ; for each value of p , the values of p_f and p_f' are calculated. Therefore, for each value of internal pressure, the frequencies that the capacity will be less than this internal pressure without uncertainty and with uncertainty are provided by the fragility curves.

2.2 COMPOSITE FRAGILITY CURVE

The development in Section 2.1 considered the pressure capacity of the containment in a single mode of failure. As identified earlier, the containment could fail in any of four failure modes: shear failure in base mat, membrane hoop tension failure of concrete cylinder, bending failure of equipment hatch, and bending failure of personnel hatch.

The probability that the containment will fail in at least one of the failure modes under a given internal pressure p is

$$P_f(p) = 1 - \prod_{i=1}^n [1 - p_{f_i}(p)] \quad (2-9)$$

where $p_{f_i}(p)$ = probability of failure mode i under an internal pressure of p .

n = total number of failure modes ($n=4$)

Π = product symbol



Equation 2-9 is derived on the basis that the failure modes are statistically independent. Although there are several reasons (e.g., common material vendor, common location and same fabricator) to believe in a high degree of dependency between failure modes, assumption of independence is conservative. Also, it may happen (as in this study) that a single failure mode dominates and contributes a major portion to the total failure probability; therefore, Equation 2-9 is a good approximation even for dependent failure modes in this case since a single mode is dominate.

The "best estimate" composite fragility curve is computed using Equation 2-9 wherein $p_{fi}(p)$ for each failure mode is calculated based on inherent random-ness only (Equation 2-2). Similarly, the $(1-\alpha)$ confidence composite fragility curve is obtained using $p_{fi}(p) = p_{fi}'$ calculated from Equation 2-8

2.3 SIGNIFICANCE OF β_R and β_U .

For each variable influencing the pressure capacity in a particular failure mode, the variabilities representing the inherent randomness and the uncertainty must be separately estimated. The differentiation between the two types of variability is somewhat judgmental. Essentially, β_R represents those sources of dispersion in the variable which cannot be reduced by more detailed evaluation, or by gathering more data. It includes the variability of structural material properties (e.g., ultimate strength of concrete and yield strength of rebar); there is a level below which this variability cannot be reduced using current standard practices of fabrication and quality control. The dispersion represented by β_U is due to our lack of understanding of the actual mode of failure, errors introduced by the approximate modeling of the structure, and due to use of engineering judgment in lieu of detailed analysis. Examples of these variabilities are assumption of support conditions as fixed or simply-supported where in reality they are of intermediate fixity; estimation of the nonlinear capacity of the structure based on the linear analysis supplemented with test results; definition of ultimate failure as when a particular cross-section reaches a failure mode.

3.0 DEVELOPMENT OF FRAGILITY CURVES FOR DIFFERENT FAILURE MODES

In the Phase I study (SMA - 1981), the following modes of failure have been identified:

1. Bending shear failure in the reinforced concrete containment base mat adjacent to reinforced concrete cylinder walls,
2. Membrane tension failure in hoop direction in the reinforced concrete cylinder adjacent to the base mat (assuming no rotational or shear restraint by the cylinder),
3. Bending failure of equipment hatch end plate, and
4. Bending failure of personnel hatch end plate.

In the following each of the above failures will be examined; the variables affecting the capacity in each failure mode will be probabilistically quantified in order to develop the fragility curves.

3.1 BENDING SHEAR FAILURE IN BASE MAT

The critical section of the base mat subjected to bending shear is identified as the location where potential diagonal cracks that do not cross any significant reinforcement may develop. The nominal shear strength for such a cross-section without web reinforcement is given by ASME Section III - CC3421.4.1 as:

$$V_c = 2.0 \left\{ 1 + \frac{0.002 N_u}{A_g} \right\} \sqrt{f'_c} b_w d \quad (3-1)$$

where N_u = axial load normal to cross-section occurring simultaneously with the shear force; is negative for tension;

A_g = gross area of section, in^2

f'_c = specified compressive strength of concrete, psi

b_w = web width, in. In the calculations reported here, b_w is taken as 1 in.

d = effective depth of base mat, in.

From Equation 3-1, it is seen that the shear strength is affected by the axial load which in turn depends on the internal pressure. Since we are expressing the capacity of the containment in terms of the internal pressure, the influence of axial load needs to be studied. Specifically, the variation of the term in brackets of Equation 3-1 as the concrete strength is varied needs to be established. The following table presents this variation:

f'_c psi	pressure, p_c psi	N_u k/in	$\left(1 + 0.002 \frac{N_u}{A_g}\right)$
3,500	46.4	8.639	0.8560
4,112	49.6	9.145	0.8476
4,890	53.6	9.780	0.8370
4,956	53.8	9.809	0.8365
6,169	59.0	10.632	0.8230

The limiting internal pressure p_c as per the Code is calculated using Equation 3-1 for values of concrete ultimate strength of the specified minimum (3,500 psi), the lowest measured value (4,112 psi), the mean strength in the structure (4,890 psi), the mean recorded strength in cylinder tests (4,956 psi) and the highest recorded strength in cylinder tests (6,169 psi). The value of N_u includes the effect of dead load



and internal pressure. It can be observed that the term in the brackets in Equation 3-1 signifying the effect of axial load is relatively constant for a wide range of variation in f'_c . Therefore, this term is treated as a constant in evaluating the variability of shear strength.

Equation 3-1 expresses the strength of the cross-section to resist inclined cracking. This strength is a function of the ultimate tensile strength of concrete and the geometric dimensions (b_w and d) of the section. In order to develop the fragility curves, we need to estimate the median value and the variability of shear strength of the base mat. The shear strength is modeled as:

$$V = 2 \left[1 + 0.002 \frac{N_u}{A_g} \right] \sqrt{f_{cstrR}} b_w d B \quad (3-2)$$

where B is a bias term reflecting the ratio of the measured to the predicted shear strength and f_{cstrR} is the actual compressive strength of concrete. f_{cstrR} , b_w , d and B are all random variables. The mean and the coefficient of variation of these variables are estimated using the concrete cylinder test data and available information on fabrication and prediction variability.

3.1.1 CONCRETE STRENGTH

In Equation 3-2, the shearing strength is expressed in terms of the compressive strength of concrete. This is so because the compressive strength is the only measured quantity in the strength tests. The tensile strength of concrete is inferred from the compressive strength. The variability in the tensile strength of concrete is approximately equal to that of the compressive strength (Mirza, et al 1979).

The compressive strength of concrete in a structure is modeled as (Mirza, et al 1979):

$$f_{cstrR} = f'_c r_{creal} r_{in-situ} r_R r_{aging} \quad (3-3)$$

where r_{creal} = real cylinder strength/specified compressive strength

$r_{\text{in-situ}}$ = in-situ strength/real cylinder strength

r_R = strength at R psi/sec/strength at 35 psi/sec

r_{aging} = strength of concrete at 25 years/strength at 28 days. (1)

The mean compressive strength of concrete in structure is

$$\bar{f}_{\text{cstrR}} = \bar{f}_{\text{cstr35}} \left\{ 0.89 [1 + 0.08 \log R] \right\} \bar{r}_{\text{aging}} \quad (3-4)$$

where

$$\bar{f}_{\text{cstr35}} = 0.675 \left\{ \bar{f}_c - 700 \right\} + 1100 \quad (3-5)$$

\bar{f}_c = mean cylinder strength at 28 days in psi.

The effect of aging is depicted in Figure 4 (Troxell, et al 1968) wherein the increase of concrete compressive strength is plotted against time for different curing methods. It is assumed that the concrete poured in the field is represented by the curve designated as "air cured, dry at test". At 28 days, the concrete has a relative strength of 50% which approaches 60% asymptotically. Therefore, the mean effect of aging, r_{aging} is estimated as 1.20. The coefficient of variation of r_{aging} is also judged to be 0.10. This means that the strength at 25 years will be between 1.08 to 1.32 times the 28 day strength in approximately 67 percent of cases.

An analysis of the cylinder strength data of concrete poured at Units 1 and 2 containments has yielded the following:

- (1) A strength of concrete at 25 years was selected since this is the mean age of the concrete during the projected 40 year operational life of the plant. (5 years during construction + 20 years of operation)



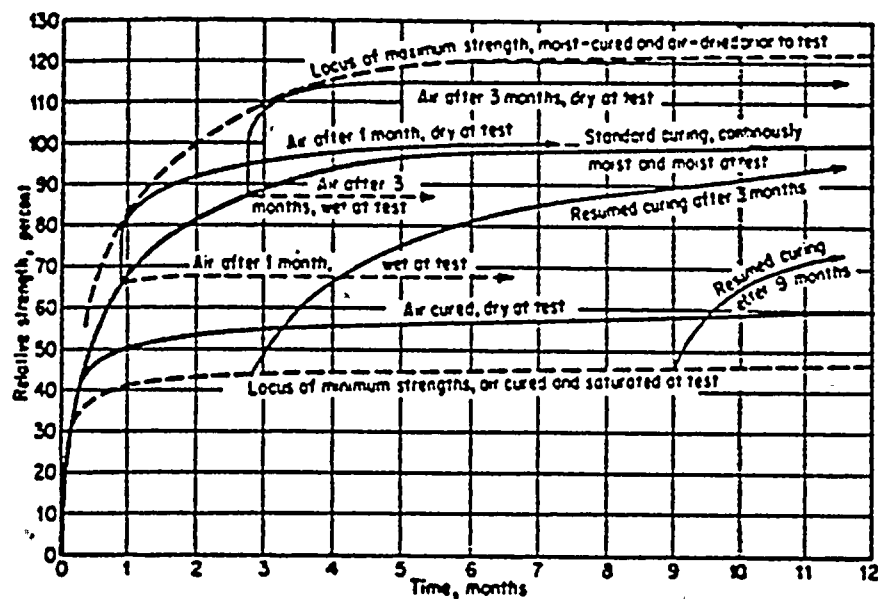


FIGURE 4. AGING EFFECTS ON CONCRETE COMPRESSIVE STRENGTH (FROM TROXELL, et al 1968)

		Unit 1	Unit 2
mean	\bar{f}_c (psi)	5,017	4,956
coefficient of variation	δ_{f_c}	0.064	0.106

using the statistics of Unit 2 strength data, \bar{f}_{cstr35} is calculated to be 3,973 psi.

The rate of loading of interest in the static overpressurization is estimated to be 80 psi/sec.

Substituting these values in Equation 3-4, we obtain

$$\bar{f}_{cstrR} = 4,890 \text{ psi.}$$

The coefficient of variation of compressive strength of concrete in the structure is approximated as:

$$\delta_{cstrR}^2 = \delta_{creal}^2 + \delta_{in-situ}^2 + \delta_R^2 + \delta_{aging}^2 \quad (3-6)$$

The coefficient of variation of the effect of speed of loading on the strength of concrete is considered negligible. The strength of concrete measured by control cylinders includes variations in the "real" concrete strength and the so-called in-test variations due to testing procedure. Thus,

$$\delta_{f_c}^2 = \delta_{creal}^2 + \delta_{in-test}^2 \quad (3-7)$$

The coefficient of variation of the ratio of in-situ strength to real cylinder strength is obtained by analyzing the core strength data. Based on Davis' (1976) data, Mirza, et al (1979) estimate the values of $\delta_{in-situ}$ and $\delta_{in-test}$ to be 0.10 and 0.04, respectively.



Substituting these values in Equation 3-6, the coefficient of variation of compressive strength in the structure, δ_{cstrR} , is obtained as 0.17. If the cylinder strength data from Unit 1 is used, the value of δ_{cstrR} would be 0.15. Since this difference is not significant, the higher value of 0.17 is used for both units.

3.1.2 VARIABILITY DUE TO FABRICATION

The shearing strength of base mat is a function of the geometric dimensions of the section. Specifically, it is influenced by the variability of the effective depth. Mirza and MacGregor (1979 a) have analyzed the available data on the actual dimensions and placement of rebars in beams and have concluded that the mean dimensions are approximately equal to the nominal values and the coefficient of variation of dimensions is about 0.01.

3.1.3 TEST TO PREDICTION BIAS

The inclined cracking Equation 3-1 to predict the shear capacity of the section is only an approximation to the actual capacity based on experimental observation and is meant to represent a lower bound of the observed data. The bias term is intended to correct the prediction for the purposes of evaluating the fragility. The parameters of the bias term B are estimated by studying the ratio of actual shear strength of beams measured in tests to the predicted strength. Because the tests were conducted under laboratory conditions, the variability in B may be interpreted as that which would exist when all parameters in the prediction Equation 3-1 are given.

Analysis of shear test data has been carried out by the ACI-ASCE Joint Committee 326 (1962), Kennedy (1967), and Ellingwood (1978). Based on the analysis of test data on beams without web reinforcement, Ellingwood (1978) has reported that

$$\bar{B} = 1.105 \text{ AND } \delta_B = 0.105.$$

3.1.4 PRESSURE CAPACITY

The mean shear strength of base mat is calculated using Equation 3-2 as 14.76 Kips/in with $f_{cstrR} = 4,890$ psi and $\bar{B} = 1.105$. The mean internal pressure, \bar{p} , corresponding to this shear stress is calculated

using the linear elastic analysis of Phase I study (SMA 1980) as 59.0 psi. The coefficient of variation of pressure capacity, δ_p , is calculated as

$$\delta_p = \sqrt{\delta_{cstrR}^2 + \delta_D^2 + \delta_B^2} = 0.20$$

$$\beta_p = \sqrt{\ln(\delta_p^2 + 1)} \approx 0.20$$

The median pressure capacity, \bar{p} , is calculated from the relationship

$$\bar{p} = \bar{p} \exp \left[-\frac{1}{2} \beta_p^2 \right] = 57.8 \text{ psi.}$$

The total variability, β_p , is split into the contributions from randomness and uncertainty as

$$\beta_R = 0.14 \quad \text{and} \quad \beta_U = 0.14.$$

In summary, the median ultimate pressure capacity against bending-shear failure of the base mat is 57.8 psi; the logarithmic standard deviations of capacity reflecting the inherent randomness and uncertainty are both estimated to be equal to 0.14. Using these statistics of ultimate pressure capacity and Equations 2-2 and 2-8, the fragilities at various internal pressures are developed as shown in Table 1.

3.2 MEMBRANE HOOP TENSION FAILURE OF CONCRETE CYLINDER

The pressure capacity, p , to resist failure of concrete cylinder under membrane hoop tension is expressed as:

$$p = \frac{2}{D} \left\{ (A_s f_y)_{\text{rebar}} + (A_s f_y)_{\text{liner plate}} \right\} B \quad (3-8)$$

TABLE 1

FRAGILITY VALUES FOR BENDING SHEAR FAILURE OF BASE MAT

Pressure p, psi	Randomness		Uncertainty	
	$u = \frac{\ln(p/y)}{\beta_R}$	p_f	u'	p'_f
1	2	3	4	5
30	-4.68	10^{-5}	-3.04	0.001
35	-3.58	10^{-4}	-1.94	0.026
40	-2.63	0.005	-0.99	0.161
45	-1.79	0.037	-0.15	0.440
50	-1.03	0.152	+0.61	0.730
55	-0.35	0.363	+1.29	0.901
60	+0.27	0.606	+1.91	0.972
65	+0.84	0.800	+2.48	0.993
70	+1.37	0.915	+3.01	0.999
75	+1.86	0.969		
80	+2.32	0.990		

Note: Entries in Column 3 are calculated using Equation 2-2;
 u' in Column 4 is calculated as

$$u' = \frac{\ln(p/y) - \beta_U \phi^{-1}(\alpha)}{\beta_R} \quad \text{for } \alpha = 0.05$$

$$\text{and } p'_f = \phi(u')$$

where D = mean diameter of wall (1380 in)

A_s = area of steel (rebar or liner plate)

f_y = yield strength of steel (rebar or liner plate)

B = bias term representing the ratio of the measured
to the predicted capacity

Area of steel, yield strength of steel and the equation bias B are treated as random variables for calculating the fragility of the containment under hoop tension failure mode.

The available reinforcement for withstanding hoop tension is:

1. 2 layers of #18 bar hoop reinforcement at 18" c/c = 5.33 in²/ft of wall.
2. 2 layers of #11 bar diagonal reinforcement at 36" c/c considering only those bars acting in tension = 1.47 in²/ft of wall.
3. 3/8" liner plate = 4.50 in²/ft of wall.

Analysis of yield and ultimate tensile strength data of rebars and liner plate gathered from manufacturer's mill certificates has yielded the results shown in Table 2. The variability due to the uncertainty in median value of yield and ultimate tensile strengths is estimated as $\beta_U = 0.10$. β_U reflects the fact that the data from different heats is not mixed in the proportions in which the rebars are used in the containment, rate of loading under internal pressure is different from the ASTM specified rate at which the mill coupons are tested, and that the strength varies spatially in the liner plate and from rebar to rebar within a heat.

Area of steel (rebar or liner plate) is also subject to variations because of the rolling process. Mirza and MacGregor (1980 b) have analyzed available data on the ratio of measured area to the nominal area of rebars and have concluded that the mean of this ratio is 0.99 and the coefficient of variation is 0.02. For this small coefficient variation, the median of the ratio can be taken as 0.99. Since the data analyzed by Mirza and MacGregor (1980 b) pertained to small size rebars, the deviation from the nominal sizes will have a more pronounced effect than in the case of large diameter bars. The use of this coefficient of variation is conservative. Also, similar data on the variation of plate thickness is not available. It is assumed that the actual median plate area is 0.99 times the nominal value and the coefficient of variation is 0.02. All variability is assigned to the inherent randomness, i.e., $\beta_R = 0.02$ and $\beta_U = 0$.

Test data on hoop failure of reinforced concrete cylinders do not exist so that the bias term reflecting the variability in the prediction formula can be directly evaluated. Hoop failure does not occur if the rebars and liner plate have just reached their yield stress level. It is also not realistic to assume that failure does not occur till the rebar and liner plate reach their ultimate tensile stresses. Excessive concrete cracking and liner weld failures (through potential defects) may limit the capacity to a value lower than if the ultimate tensile strength of steel is attained. The median pressure capacity corresponding to yielding of steel is calculated as 66.2 psi; for ultimate tensile failure of steel, the median capacity is calculated as 101.7 psi. The actual median pressure capacity is estimated as the average of the above two values, i.e., 84 psi; therefore, $\bar{V} = 1.27$. The variability in the prediction formula is assumed to be totally due to our lack of knowledge of the failure mode, i.e., $\beta_R = 0$. Taking the capacity at steel yielding to be two standard deviations below the median value, the value of β_U is calculated as $(84-66.2)/84 \times 2 = 0.11$.



Using Equation 3-8, the logarithmic standard deviation in pressure capacity due to inherent randomness is calculated as $\beta_R = 0.03$. The uncertainty in the median capacity is given by

$$\beta_U = \sqrt{0.10^2 + 0.11^2} = 0.15$$

In summary, the median pressure capacity against membrane hoop tension failure of concrete cylinder is 84 psi; the logarithmic standard deviations of capacity reflecting the inherent randomness and uncertainty are, respectively, 0.03 and 0.15. Using this information, the values of p_f and p_f' are calculated as functions of internal pressure and are included in Table 3.

TABLE 2
REBAR AND LINER PLATE STRENGTH DATA

Item	Yield Strength		Ultimate Tensile Strength	
	Median psi	β_R	Median psi	β_R
#18 Rebar	48,497	0.05	82,197	0.05
#11 Rebar	50,106	0.03	83,332	0.04
Liner Plate	48,120	0.035	64,460	0.04

3.3 BENDING FAILURE OF EQUIPMENT HATCH END PLATE

The equipment hatch cover (Figure 5) is in the form of a flat plate; therefore, pressure induced loading must be carried by bending rather than by membrane action. The hatch cover has a bolted splice in the region of high bending moment. The personnel hatch is located unsymmetrically within the equipment hatch. Because of these reasons,

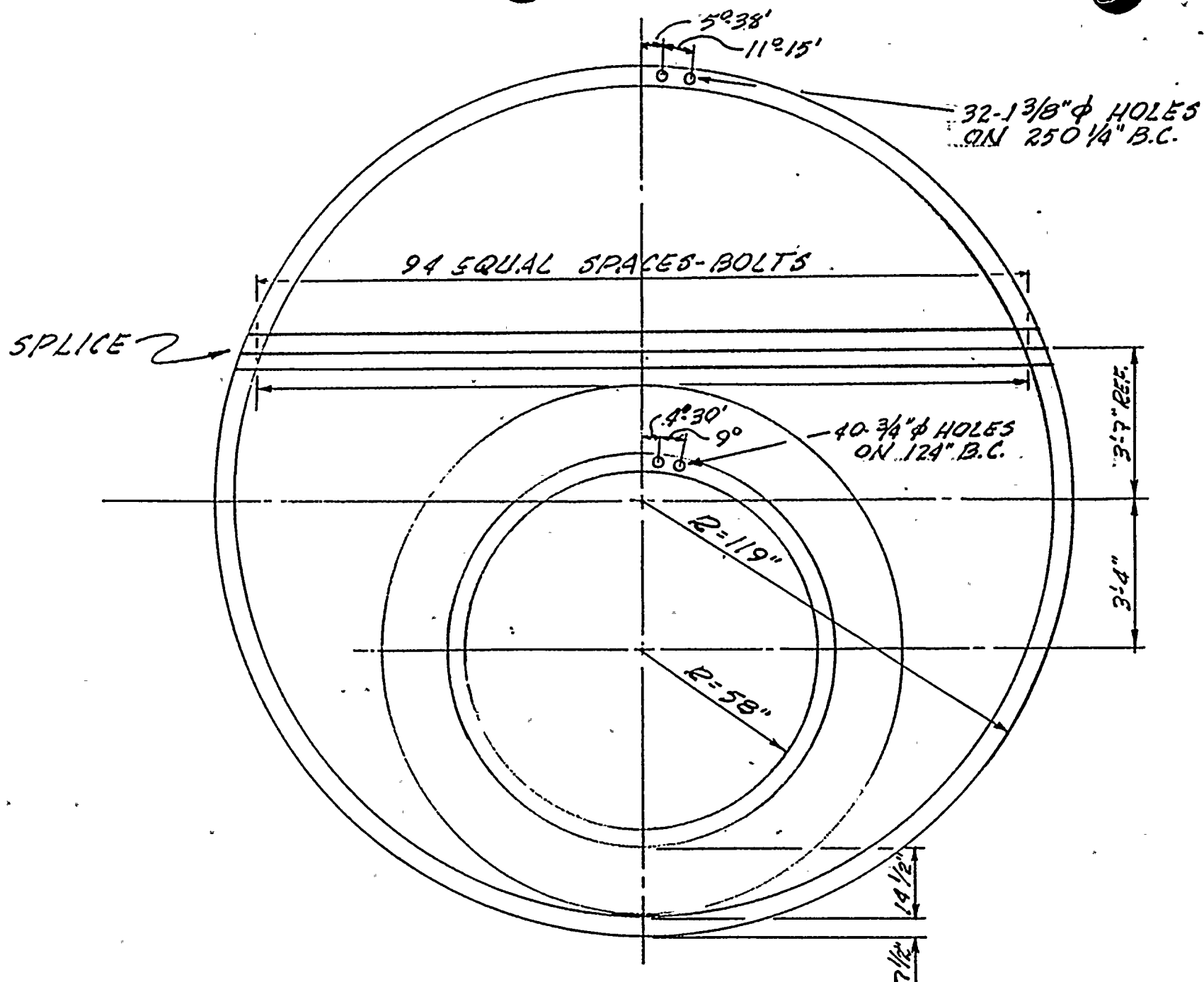


FIGURE 5. GENERAL ARRANGEMENT OF THE EQUIPMENT HATCH CLOSURE PLATE



a detailed finite element analysis was performed in the first phase of this project (SMA-1981) to calculate the pressure capacity at first yielding of the plate. The approach taken herein is to estimate the ultimate pressure capacity of the equipment hatch end plate based on the inelastic behavior of the end plate.

The ultimate pressure capacity p of the end plate can be expressed as

$$p = g(f_y) F B \quad (3-9)$$

where $g(f_y)$ is the relationship between the pressure capacity and yield strength of the plate material. This is the equation used to predict the capacity given the dimensions and boundary conditions of the plate. F is a random variable reflecting the variability in the thickness of the plate and area of bolts or weld. B is a bias term reflecting the variability of the ratio of the actual capacity to the predicted capacity.

3.3.1 MEDIAN PRESSURE CAPACITY

The median pressure capacity \bar{p} is

$$\bar{p} = g(\bar{f}_y) \bar{F} \bar{B}. \quad (3-10)$$

If the plate is assumed to be uniformly 4 in. thick (i.e., ignoring the bolted splice and the personnel hatch) and to be simply supported, the median pressure capacity against plastic bending with the formation of a plastic hinge at the center is calculated as follows (Roark, 1965):

$$\text{Maximum moment} = \frac{1}{64} \bar{p} D^2 (3+\nu) \quad (3-11)$$



$$\text{Plastic Moment capacity of the section} = \frac{t^2}{4} \bar{f}_y^v \quad (3-12)$$

$$\text{Equating the two, } \bar{p}^v = \frac{16 t^2 \bar{f}_y^v}{D^2(3+v)} \quad (3-13)$$

where t = thickness of the plate (4 in.), D = diameter of the plate (238 in.), v = Poisson's ratio for steel (0.3) and \bar{f}_y^v = median yield strength of plate material. Analysis of mill test data has resulted in $\bar{f}_y^v = 47,689$ psi; therefore, $\bar{p}^v = 65.3$ psi.

The exact boundary condition around the plate edge is not known. If the plate is assumed clamped, the median pressure capacity would be as high as 107.7 psi. However, the splice is assessed as unable to transfer moments induced by pressures larger than 88.6 psi. Therefore, the bias term B ranges from 1.00 to $88.6/65.3 = 1.37$ purely based on the uncertainty in the boundary conditions. The median value of bias, \bar{B} , is estimated to be 1.20.

The median pressure capacity to withstand plastic bending failure of the equipment hatch end plate is estimated as $1.20 \times 65.3 = 78.4$ psi.

3.3.2 VARIABILITY OF PRESSURE CAPACITY

Analysis of mill test data on SA516 plate material has shown that the coefficient of variation of yield strength is 0.044. Therefore, $\beta_R = 0.044$. The uncertainty in the yield strength is estimated to be $\beta_U = 0.10$.

The total variability in the thickness of plate measured by the coefficient of variation is estimated to be 0.05; it is split into $\beta_R = 0.03$ and $\beta_U = 0.03$.



The variability in the bias term B is attributed totally to the lack of knowledge in the boundary conditions and the modeling errors (i.e., assumption of uniform thickness in place of the unsymmetric configuration of Figure 5). β_U is estimated by assuming the pressure capacity corresponding to simply supported condition, i.e., 65.3 psi is two standard deviations below the median pressure capacity of 78.4 psi. Therefore $\beta_U = 0.08$.

With these values, the logarithmic standard deviations of pressure capacity are obtained as:

$$\beta_R = 0.05$$

$$\beta_U = 0.13.$$

3.3.3 FRAGILITY OF EQUIPMENT HATCH COVER

The median pressure capacity of equipment hatch cover against bending failure is estimated as 78.4 psi; the values of β_R and β_U are, respectively, 0.05 and 0.13. Using this information, the values of p_f and p_f' are calculated as functions of internal pressure and are included in Table 3.

3.4 BENDING FAILURE OF PERSONNEL HATCH COVER PLATE

The personnel hatch cover plate is stiffened as shown in Figure 6 and has an access door which transmits the pressure load onto the hatch cover plate as a reaction line load at the support. In the first phase of this project (SMA-1981), a detailed finite element analysis of the hatch cover plate was performed assuming that the plate was simply supported at its connection to the personnel hatch barrel. It was shown that the plate material reaches its median yield strength of 50.4 ksi at a cross-section for an internal pressure of 44.5 psi. The approach taken herein is to estimate the ultimate pressure capacity of the personnel hatch cover based on inelastic behavior.



CALCULATION OF COMPOSITE FRAGILITIES

P	Randomness, p_f				Total P_f	Uncertainty, p'_f				Total P'_f
	Mode 1	2	3	4		1	2	3	4	
30	0.00001	0	0	0	0.00001	0.001	0	0	0	0.001
35	0.00010	0	0	0	0.0001	0.026	0	0	0	0.026
40	0.005	0	0	0	0.0050	0.161	0	0	0	0.161
45	0.037	0	0	0	0.037	0.440	0	0	0	0.440
50	0.152	0	0	0	0.152	0.730	0	0	0	0.730
55	0.363	0	0	0	0.363	0.901	0	0.138	0	0.915
60	0.606	0	0	0	0.606	0.972	0.001	0.695	0.0139	0.992
65	0.800	0	0.00014	0	0.800	0.993	0.363	0.977	0.5319	0.999
70	0.915	0	0.01180	0	0.922	0.999	0.983	0.993	0.9861	~1
75	0.969	0.00014	0.1867	0.0276	0.975		0.999	~1	0.9999	
80	0.990	0.0515	0.6554	0.4721			~1			
85		0.6517	0.9474	0.9515						
90		0.9893	0.9963	0.9992						
95		0.99998	0.9999	~1						



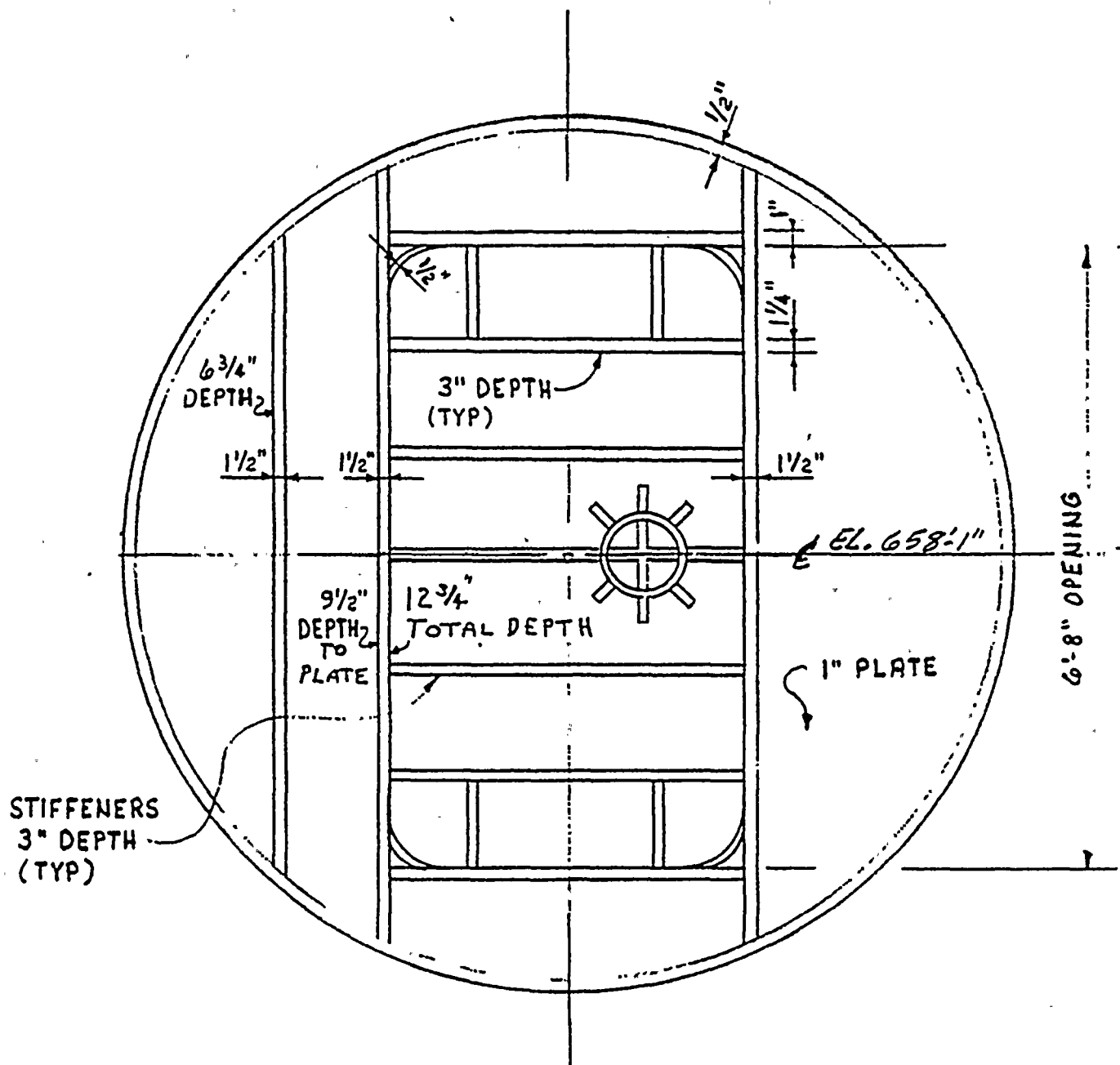


FIGURE 6. GENERAL ARRANGEMENT OF THE PERSONNEL HATCH CLOSURE PLATE





The ultimate pressure capacity p of the cover plate can be expressed as:

$$p = g(f_y) F B \quad (3-14)$$

where $g(f_y)$ is the relationship between the pressure capacity and yield strength of the plate material. This is the equation used to predict the capacity given the dimensions and boundary conditions of the plate. F is a random variable reflecting the variability in the thickness of the plate and stiffening elements. B is a bias term reflecting the variability of the ratio of the actual capacity to the predicted capacity.

3.4.1 MEDIAN PRESSURE CAPACITY

The median pressure capacity \bar{p} is

$$\bar{p} = g(\bar{f}_y) \bar{F} \bar{B} \quad (3-15)$$

The median pressure capacity based on the plastic moment capacity of the stiffener A is estimated to be 1.5 times the elastic pressure capacity, i.e., $1.5 \times 44.5 = 66.8$ psi. The shape factor for the stiffener is taken as 1.5. It could be higher if an effective T-section is used for computing the plastic section modulus. The plate section between the stiffener and the edge - Section AA - has a much higher capacity, equal to 112 psi. The access door has a 0.5 in. steel plate stiffened by 3 in. x 1-1/4 in. plates at 15 in. centers. The pressure capacity based on the plastic moment capacity of the access door stiffener is calculated as 102.8 psi.

The bias term reflecting the uncertainty in the boundary conditions and the imperfect modeling of the structure is estimated to have a median value, \bar{B} , of 1.2.

The median pressure capacity to withstand the plastic bending failure of the stiffener A in the cover plate is estimated as $1.2 \times 66.8 = 80.2$ psi.

3.4.2 VARIABILITY OF PRESSURE CAPACITY

Analysis of mill test data on SA516 plate material used as equipment-hatch insert plates has shown that the coefficient of variation of yield strength is 0.02. This low value of the coefficient of variation is due to the fact that all steel for these plates came from the same heat. Therefore, the value β_R is taken to be 0.02. The uncertainty in the yield strength is judged to be $\beta_U = 0.10$.

The values of logarithmic standard deviations of F , β_R and β_U corresponding to the variability of plate thickness are estimated to be 0.03 each.

The variability in the bias term B is attributed totally to the lack of knowledge in the boundary conditions and to the modeling errors. β_U is estimated by assuming the low value of pressure capacity, i.e., 66.8 psi is 2 standard deviations below the median pressure capacity. Therefore, β_U equals 0.08.

With these values, the logarithmic standard deviations of pressure capacity are obtained as

$$\beta_R = 0.035$$

$$\beta_U = 0.130$$

3.4.3 FRAGILITY OF PERSONNEL HATCH COVER

The median pressure capacity of personnel hatch cover against bending failure is estimated as 80.2 psi; the values of β_R and β_U are, respectively, 0.035 and 0.13. Using this information, the values of P_f and p_f' are calculated as functions of internal pressure and are included in Table 3.



4.0 COMPOSITE FRAGILITY CURVES

The major failure modes under which the containment may fail have been studied in Section 3.0. For each failure mode, the fragilities P_f and p_f' have been estimated.

The containment could fail if any one of the failure modes occurs at a specified internal pressure. The probability that at least one of the failure modes occurs is given by Equation 2-9. This is called the composite fragility. Table 3 shows the composite fragilities at two levels - best estimate and 95% confidence value.

It can be seen that the shear failure of base mat has a significant contribution to the fragilities at internal pressures below 60 psi. Therefore, the assumption of independence between failure modes (Equation 2-9) is not severe. Figure 1 shows the composite fragility curves. The median ultimate pressure capacity has a best estimate value of 57.8 psi. The pressure capacity that is exceeded with 95 percent frequency considering only the inherent randomness about the median is 46.0 psi. The pressure capacity that is exceeded with 95 percent frequency at 95 percent confidence considering both the inherent randomness about the median and the uncertainty in the median itself is 36 psi.



5.0 DISCUSSION AND CONCLUSIONS

This study has shown that the containment can withstand static internal pressures at least three times larger than the design pressure of 12 psi. The median pressure capacity is 4.8 times larger than the design pressure. The following points should be considered in reviewing the results of this study:

1. Data does not exist of tests on either actual or scale-model reinforced concrete containments subjected to static internal pressure upto ultimate failure or significant leakage. Recently, some tests on scale-model pre-stressed concrete containments have been performed (Rizkalla, et al, 1979; Donten, et al, 1979). These tests have shown that a large safety factor (of the order of 3.0) exists over the design pressure. At the ultimate failure mode, the behavior of a reinforced concrete containment is expected to be similar to that of a prestressed concrete containment.

2. A nonlinear analysis of the equipment hatch cover plate using a finite element model was performed; the deformation of the plate was found to be within acceptable limits for internal pressures upto 70 psi.

3. A review of detailed analyses of containment buildings subjected to static internal pressure at Sequoyah, McGuire, Indian Point and Zion indicates that the ratio of lower bound pressure capacity to design pressure ranges from 2.5 to 3.3. The safety factor of 3.0 at 95% reliability and 95% confidence calculated in this study falls within this range.

4. If the two types of variability, i.e., inherent randomness and uncertainty, are combined, the "best estimate" of pressure capacity that is exceeded with 95 percent frequency is calculated as 41.6 psi.



5. The methodology followed in this study permits a rational use of measured material strength data coupled with judgment on the variability of procedures for predicting the capacity of the structure.

In conclusion, the median static pressure capacity of the containment is 4.8 times the design pressure; the five percentile value of the capacity at 95% confidence is 3.0 times the design pressure. This phase of the study confirms the finding of the first phase that the D.C. Cook containments have a substantial safety margin beyond the design pressure.



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NOTATION

A_g	gross area of section
A_s	area of steel rebar or liner plate
B	bias term representing the ratio of actual capacity to the predicted capacity; it is a random variable with median \bar{B} and coefficient of variation δ_B
b_w	width of beam
D	diameter of wall or plate
d	depth of beam
F	factor reflecting the variability in the thickness of plate, i.e., ratio of actual thickness to the nominal plate thickness
f_c	compressive strength of concrete measured in cylinder tests; \bar{f}_c : mean compressive strength from cylinder test data; δ_f = coefficient of variation; f'_c : specified compressive strength of concrete at 28 days
f_{cstrR}	compressive strength of concrete in the structure subjected to a rate of loading of R psi/sec., \bar{f}_{cstrR} : mean value of f_{cstrR}
f_y	yield strength of steel
N_u	axial load normal to the cross-section occurring simultaneously with the shear force; is negative for tension



NOTATION (Continued)

n	total number of failure modes $i = 1, \dots, n$
p	ultimate pressure capacity of the containment, \bar{p} : median value, and β_p : logarithmic standard deviation of pressure capacity
P_f	cumulative failure frequency (fragility) of the containment at internal pressures below a specified value, considering the inherent randomness only
P_f^i	cumulative failure frequency (fragility) of the containment at internal pressures below a specified value with a confidence $(1-\alpha)$, considering both the inherent randomness and the uncertainty
$P(p)$	probability that the containment will fail at internal pressures less than p in at least one of the failure modes
r_{aging}	strength of concrete at 40 years/strength at 28 days; \bar{r}_{aging} : mean and δ_{aging} : coefficient of variation
r_{creal}	real cylinder strength/specified compressive strength, i.e., f_c/f'_c ; δ_{creal} = coefficient of variation
$r_{in-situ}$	in-situ strength/real cylinder strength of concrete $\delta_{in-situ}$ = coefficient of variation
r_R	strength at R psi/sec/strength at 35 psi/sec
t	thickness of plate



NOTATION (Continued)

α	probability of exceedance; $(1-\alpha)$ is the confidence
β	logarithmic standard deviation of a random variable; β_R : due to inherent randomness, β_U : due to uncertainty
δ	coefficient of variation of a random variable
ϵ	random variable with unit median; ϵ_R is a random variable with unit median representing the inherent randomness and ϵ_U is a random variable representing the uncertainty
$\Phi(u)$	standard Gaussian cumulative distribution function, i.e., probability that the random variable takes values less than or equal to u
ν	poisson's ratio of the material

Attachment No. 4 to AEP:NRC:00500E
Additional Information on Hydrogen Mitigation and Control
Donald C. Cook Nuclear Plant Unit Nos. 1 and 2
Revised DIS Technical Specifications

Table 3.6-1A

Distributed Ignition System

<u>Location</u>	<u>No. of Igniters Per Train Per Group</u>
1. <u>Upper Volume Igniter Groups</u>	
a. Phase 1	6
b. Phase 2	7
c. Phase 3	5
2. <u>Lower Volume Igniter Groups</u>	
a. Phase 1	6
b. Phase 2	6
c. Phase 3	5

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Table 3.6-1A.
Distributed Ignition System

<u>Location</u>	<u>No. of Igniters Per Train Per Group</u>
1. <u>Upper Volume Igniter Groups</u>	
a. Phase 1	6
b. Phase 2	7
c. Phase 3	5
2. <u>Lower Volume Igniter Groups</u>	
a. Phase 1	6
b. Phase 2	6
c. Phase 3	5

Attachment No. 5 to AEP:NRC:00500E
Donald C. Cook Nuclear Plant Unit Nos. 1 and 2

Drawings Transmitted to Mr. S. Miner

1-2-3181-3
1-2-3182-10
1-2-3183-10
1-2-3186-6
1-2-3187-12
1-2-3187A-19
1-2-3187B-14
1-2-3194-16

Attachment No. 4 to AEP:NRC:00578
Donald C. Cook Nuclear Plant Unit No. 1
Response to NRC SER on IE Bulletin 79-01B
Environmental Equipment Qualification
Summary Sheets



EQUIPMENT DESCRIPTION	ENVIRONMENT 113			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 hr	116 hrs	FSAR 1006 7.5-2	8	Seq	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 022.9-1,2	345	FSAR APP Q	8	SEQ.	NONE
COMPONENT: CONTROL CABLE	Pressure (PSIA)	Fig 1 Fig 2	121.7	AED 6504	8	SEQ.	NONE
MANUFACTURER: CONTINENTAL	Relative Humidity (%)	100	100		8	SEQ.	NONE
MODEL NUMBER: ITEM # 3119	Chemical Spray	2000 ppmB 1.14 wt % & 3.00 wt % pH 9-11	2500 ppmB 1.43 wt % & 3.00 wt % pH 9-10 acid	T.S. 314.5 314.5.6	8	SEQ.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	4	150	WCAP 7410-L VOL1	8	SEQ.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	Submerged	* Floodup Tubes		61	Combination	NONE
LOCATION: IN & OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: 612 ABOVE FLOOD LEVEL: NO							

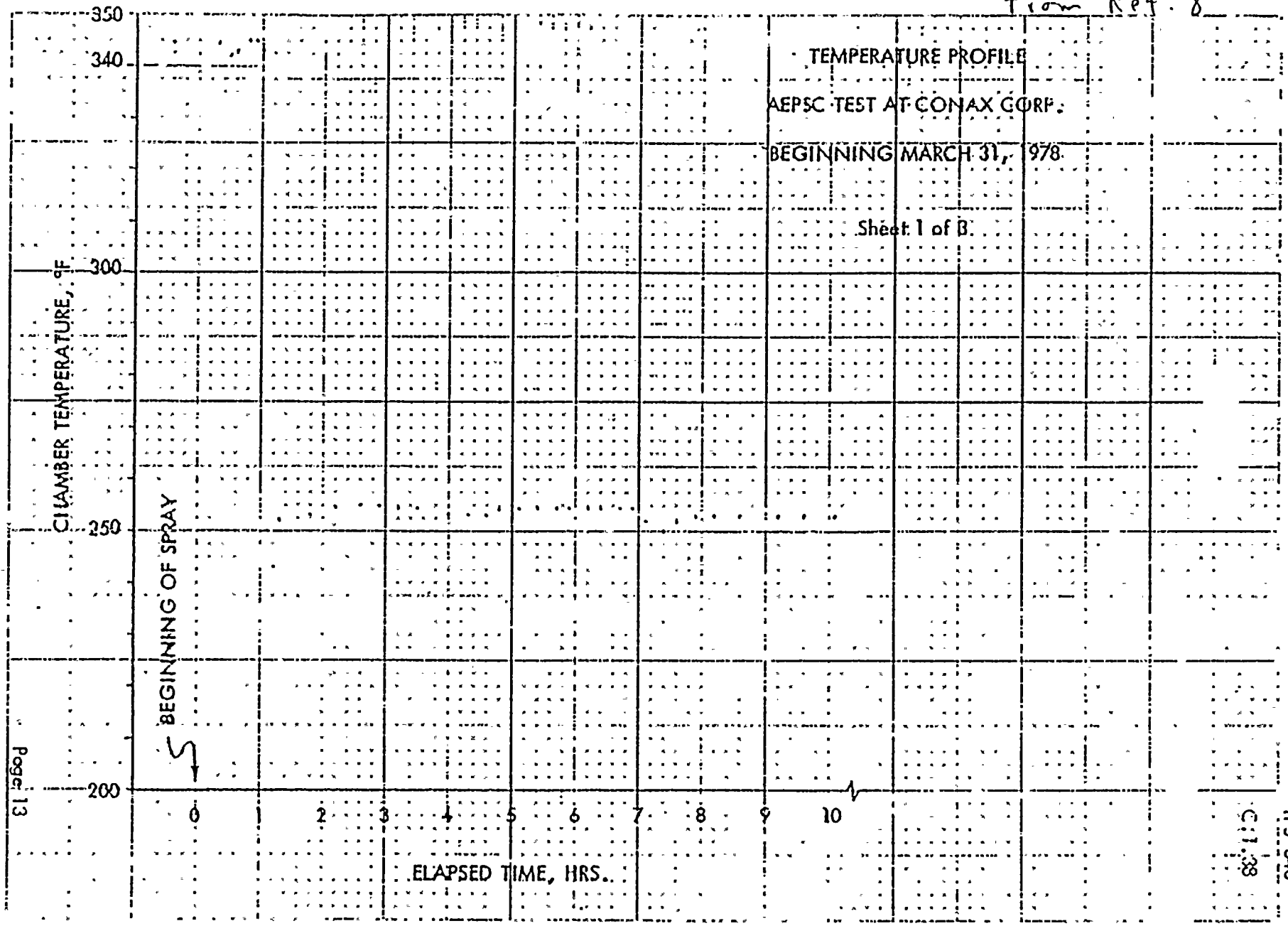
*Documentation References:

8. CONAX ADP. TEST REPORT IPS-34B
61. Floodup Tube Qual. Packet

Notes:

- * EXCEPT for CABLES on VCR-11, 102, 103, 104, 105, 106 & 107. See Cable Note 2a.

from Ref. 8

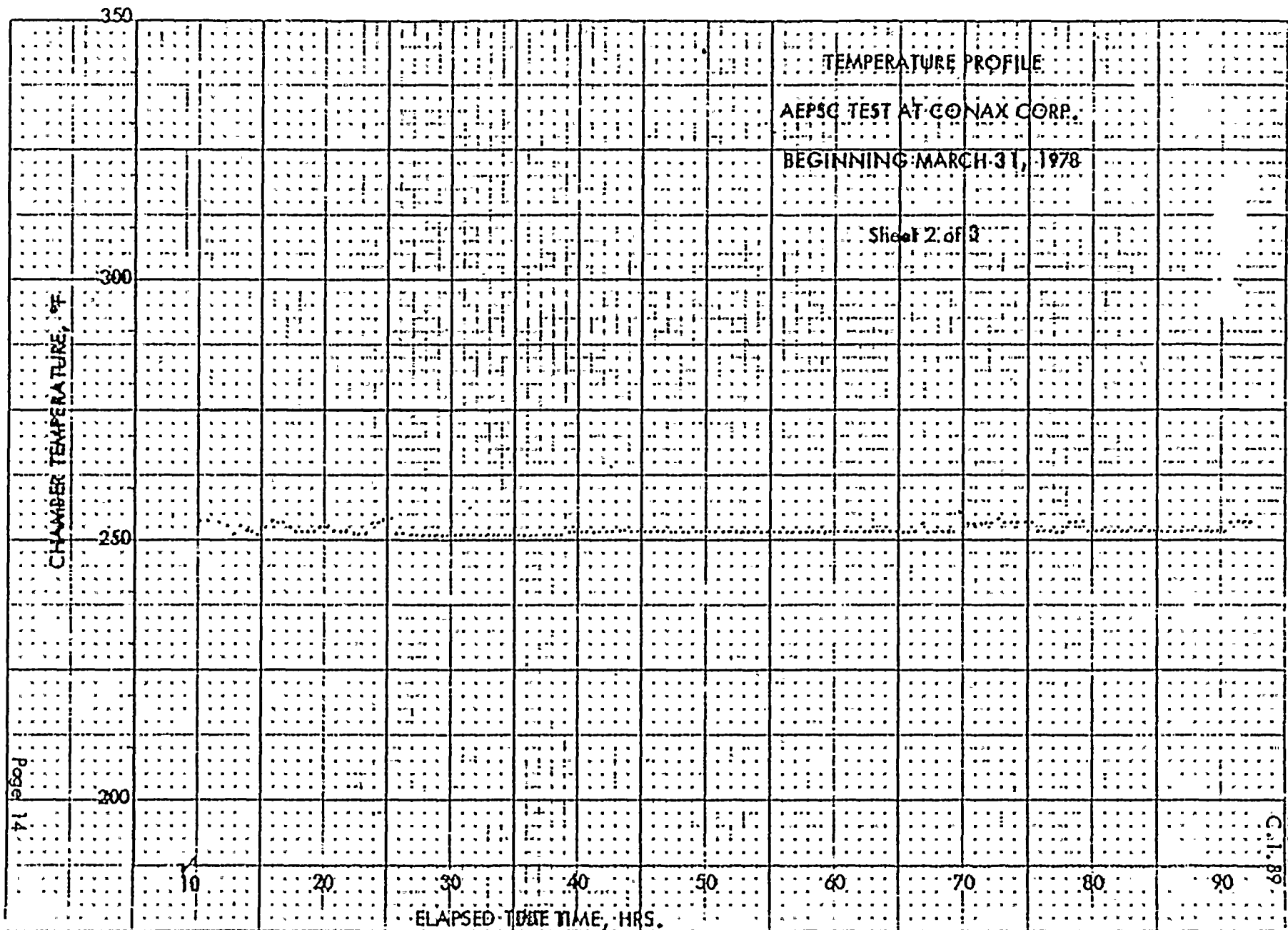


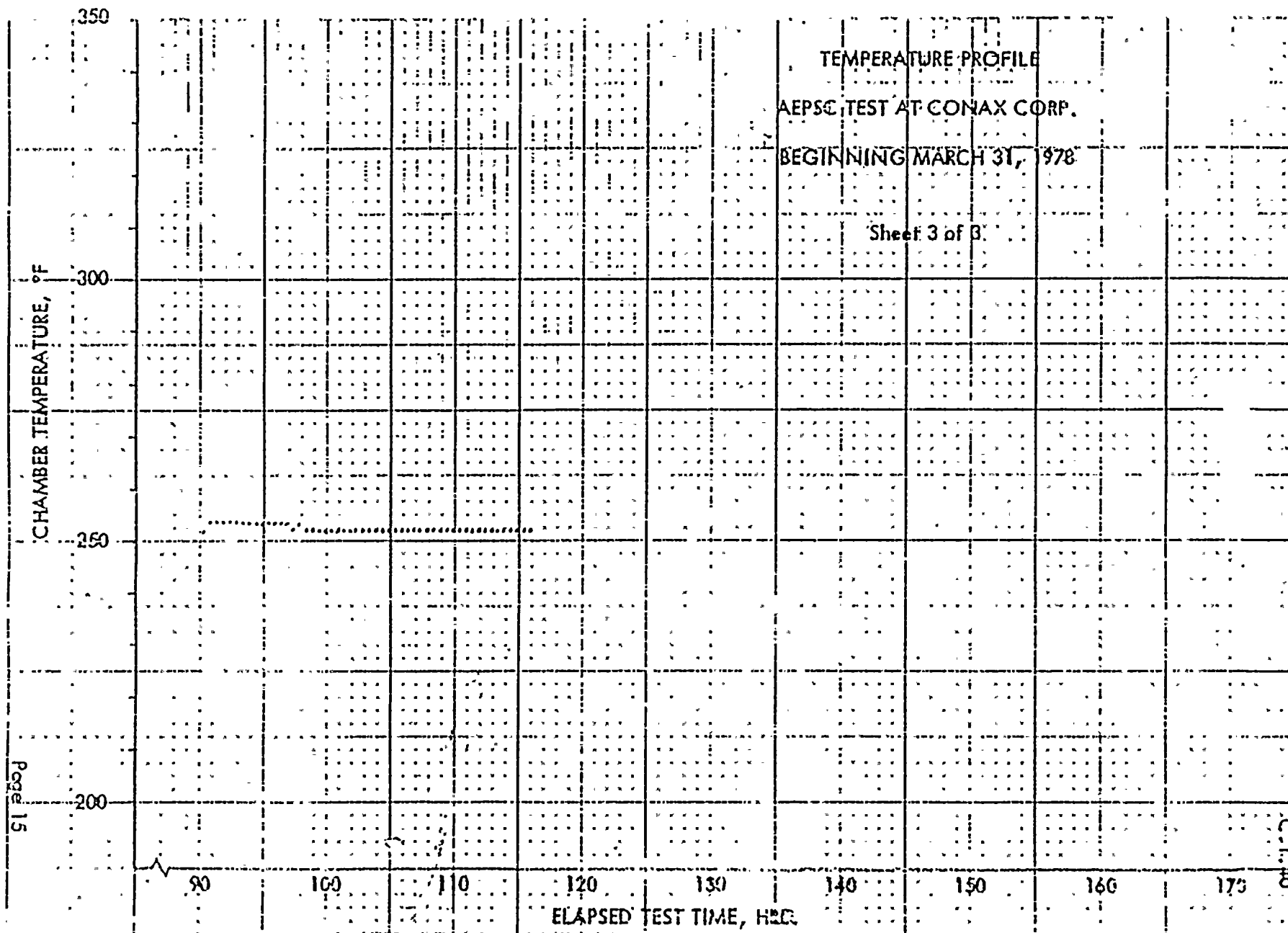
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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	24 hrs	116 hrs	FSAR Table 7.5.2	8	Seq	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	FIG 90-27	345	FSAR APP 0	8	SEQ.	NONE
COMPONENT: CONTROL CABLE	Pressure (PSIA)	FIG 0-27	121.7	FSAR APP 0	8	SEQ.	NONE
MANUFACTURER: CONTINENTAL	Relative Humidity (%)	NA	100	NA	8	SEQ.	NONE
MODEL NUMBER: ITEM # 3120	Chemical Spray	NA	2500 ppmB 143wt% Boric Acid PH 9-10	NA	8	SEQ.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	16.6	150	See Note 1	8	SEQ.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA							

*Documentation References:

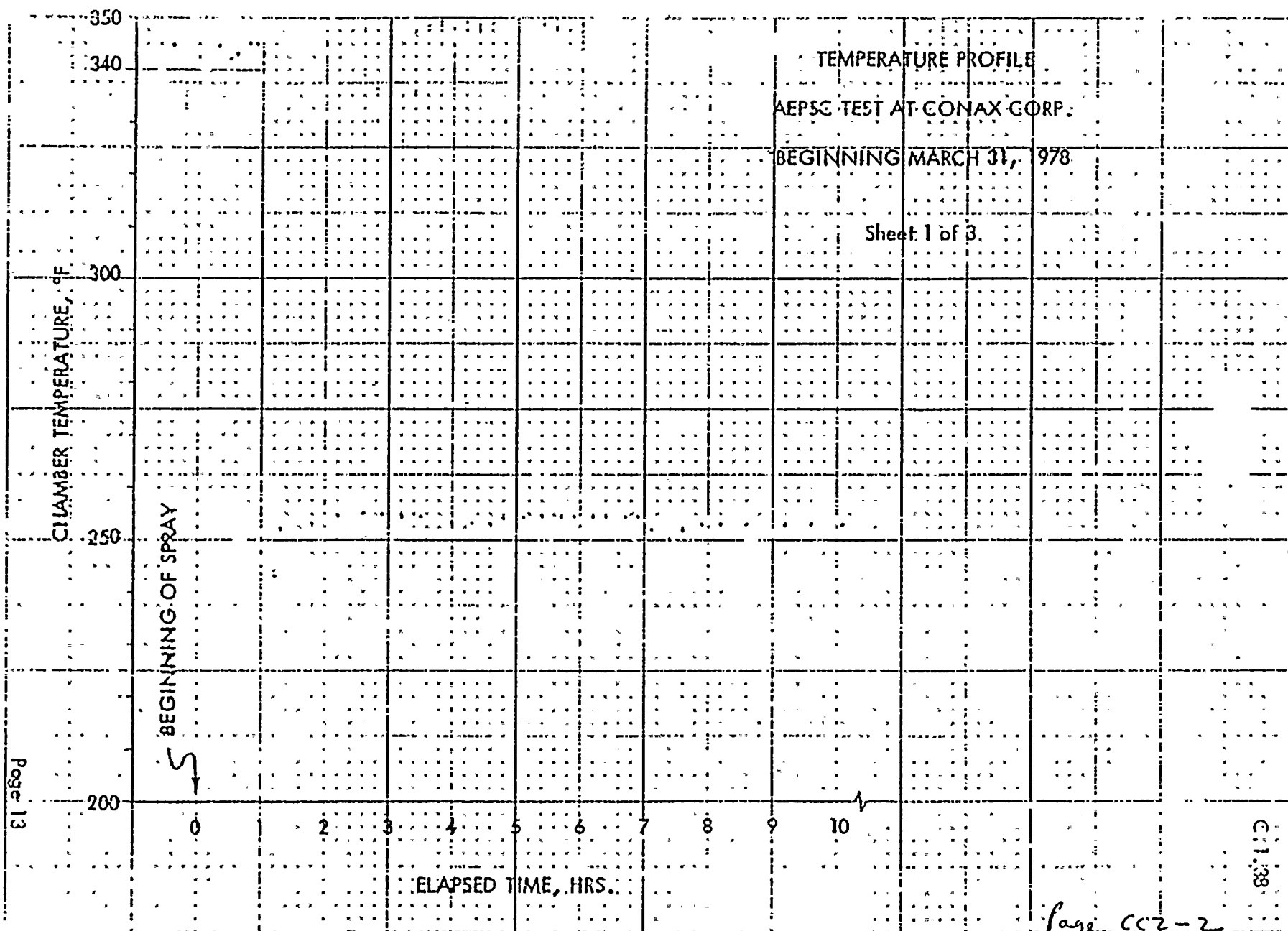
8. CONAX ASEP. TEST REPORT IPS-348

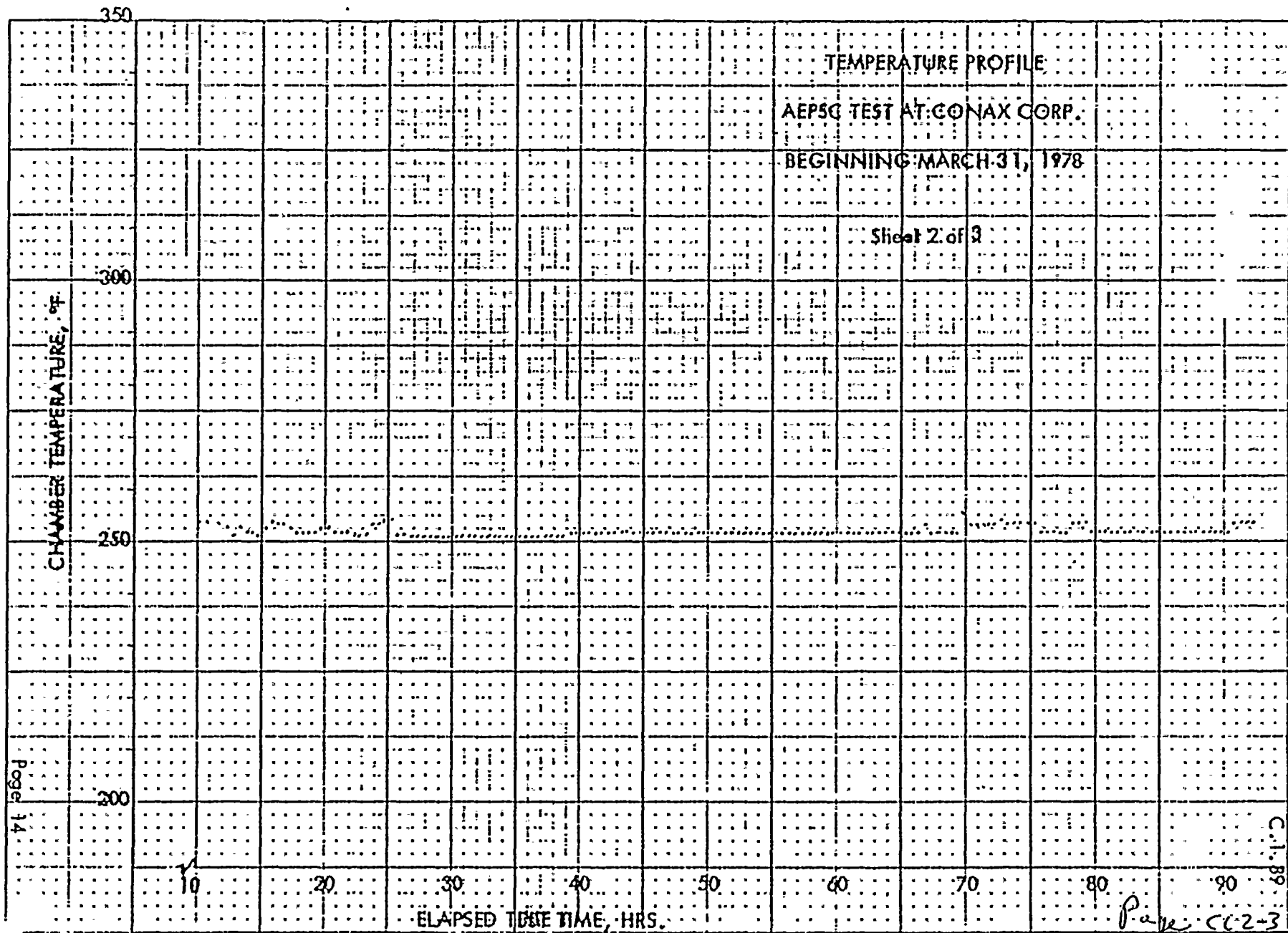
Notes:

1) Outside Cont. RAD. Bounding Calculation (Re-59)
 AEPSC NS+L CALCULATION DC-N-6420-2.

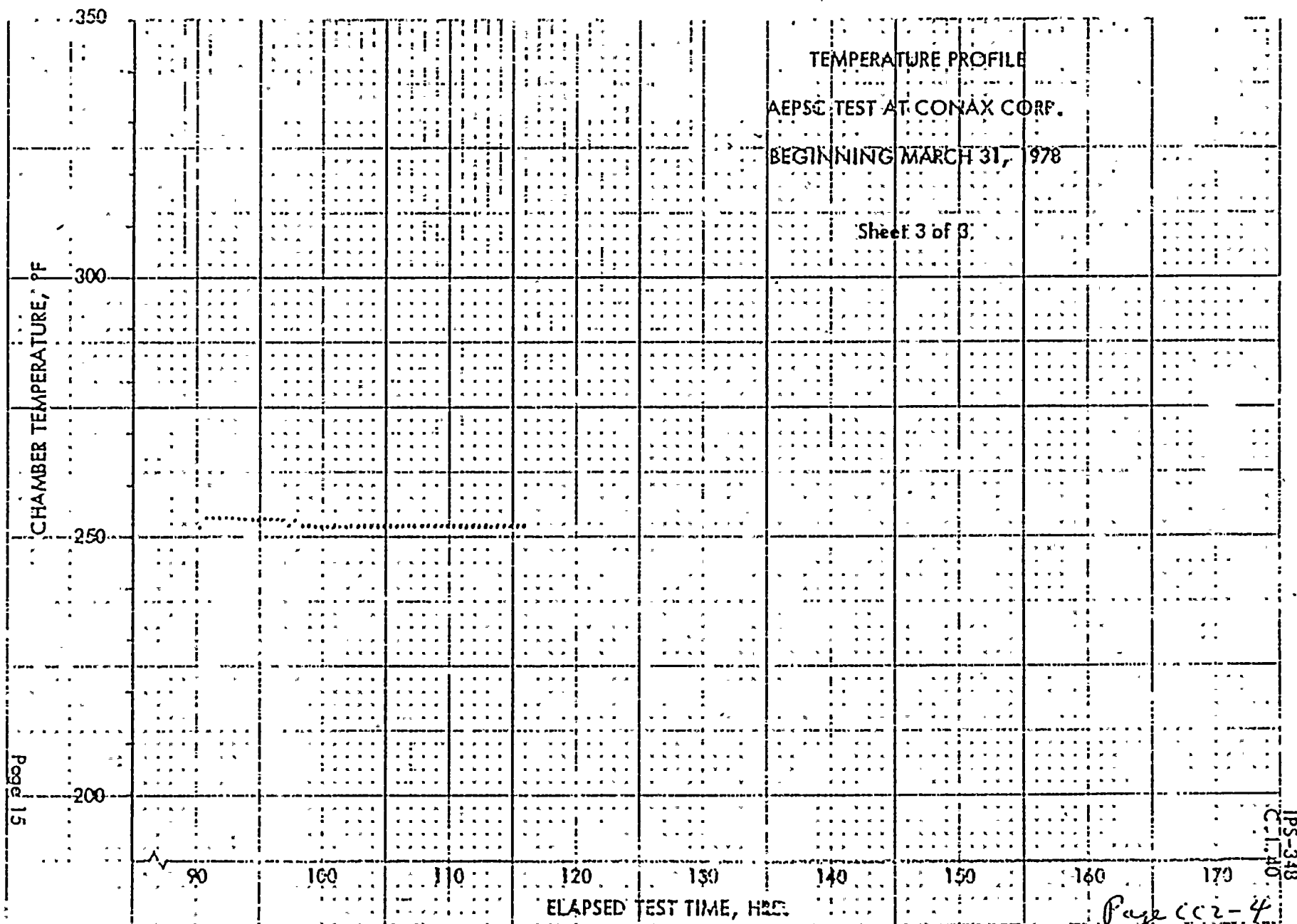
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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	24 hrs	116/hrs	FSAC TABLE 7.5-2	8	Seq	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	F19 0-27	345	FSAR APP 0	8	SEQ.	NONE
COMPONENT: CONTROL CABLE	Pressure (PSIA)	F19 0-27	121.7	FSAR APP 0	8	SEQ.	NONE
MANUFACTURER: GENERAL ELECTRIC	Relative Humidity (%)	NA	100	NA	8	SEQ.	NONE
MODEL NUMBER: ITEM # 3120	Chemical Spray	NA	2500 ppmB 1.43 wt % Boric Acid pH 9-10	NA	8	SEQ.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	16.6	150	See Note 1	8	SEQ.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS							
LOCATION: OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Submergence	NA	NA	NA	NA	NA	NA

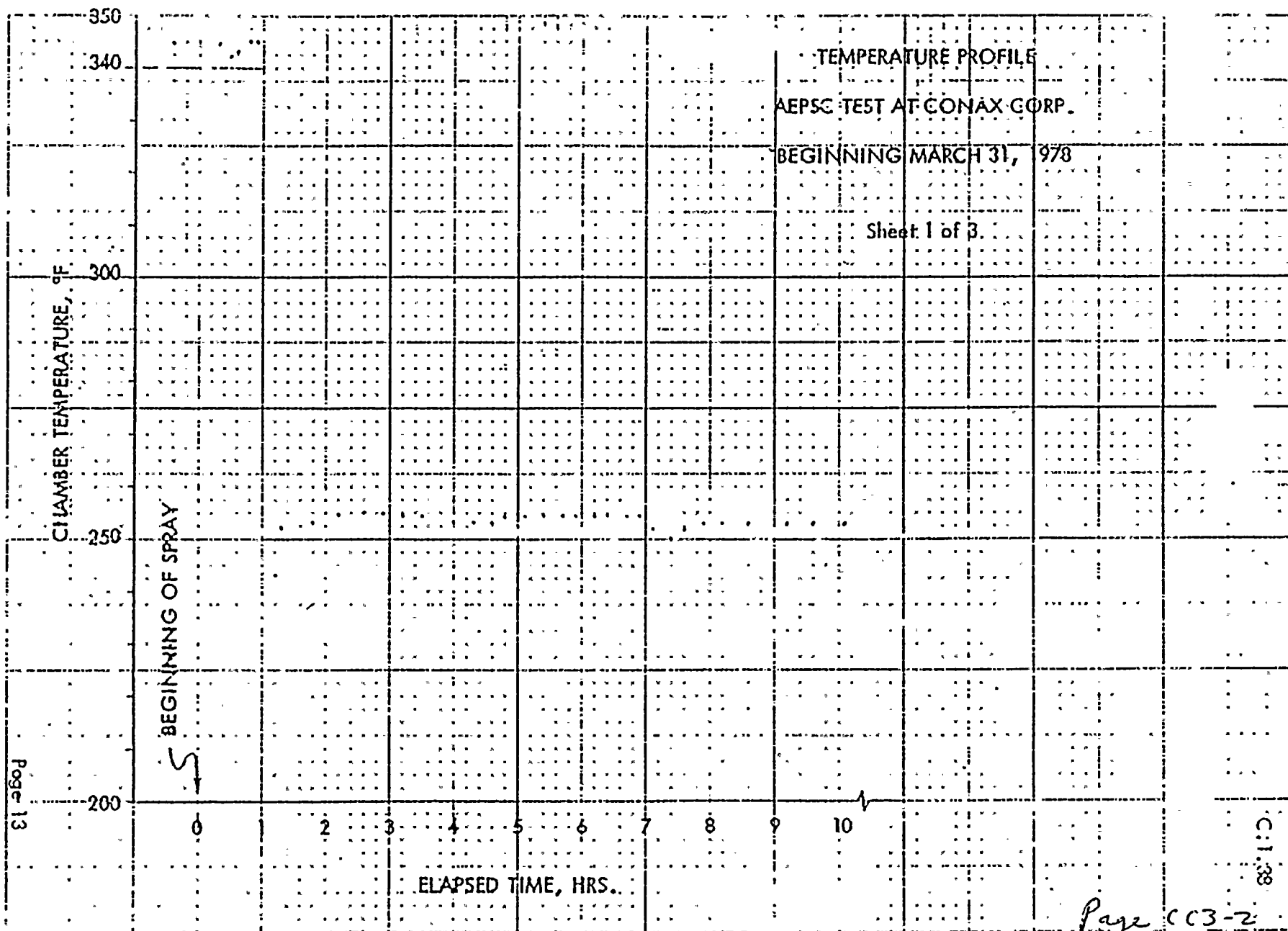
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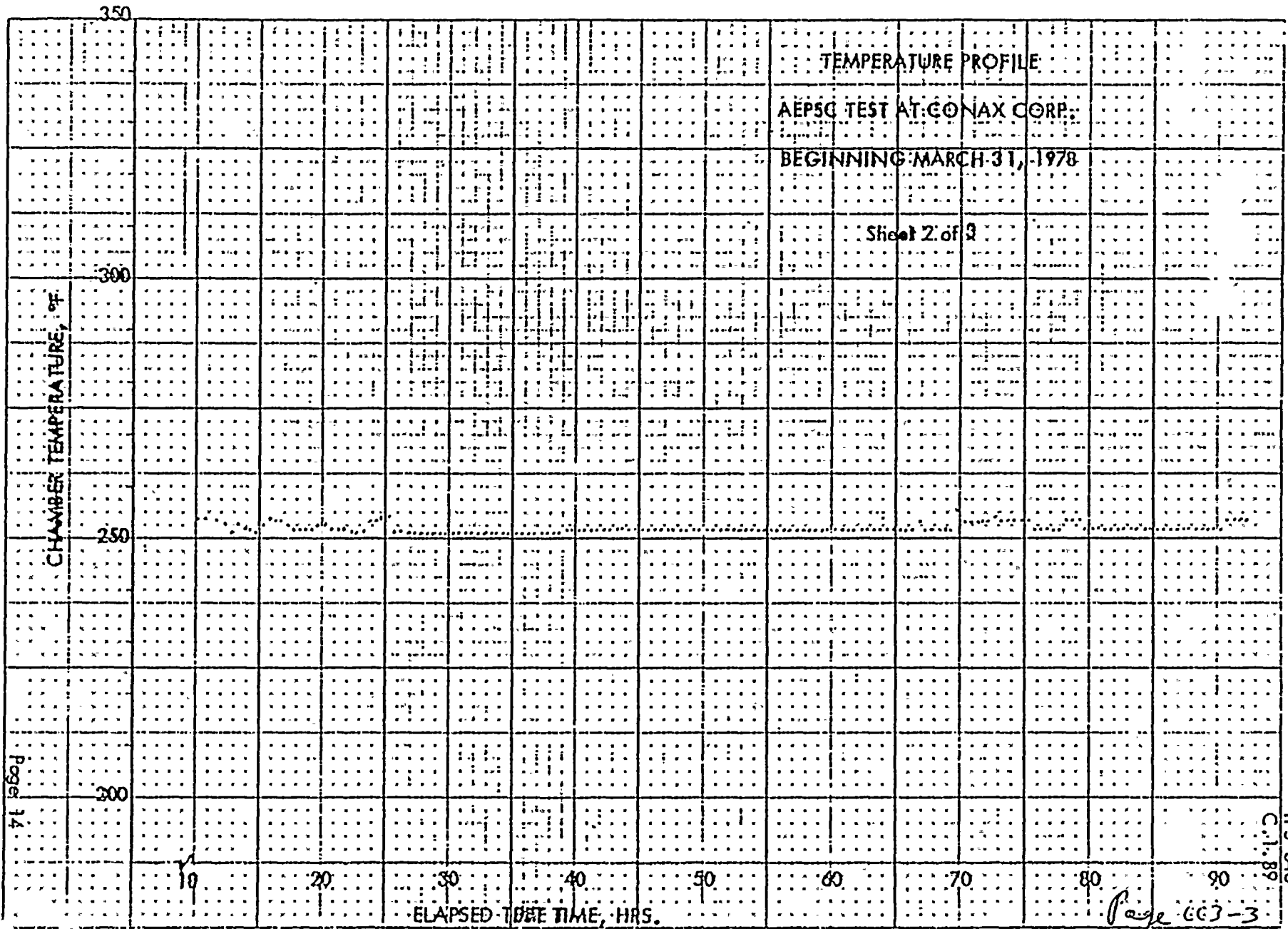
8. CONAX CORP. TEST REPORT IPS-348

Notes:

1) Outside Cont. RAD. Bounding Calculation
AEPSC NS+L Calculation (Ref 59)
OL-N-6420-2

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23 V6
27 V32
27 V32
27 - 51 V6





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CHAMBER TEMPERATURE, °F

Page 15

350

300

250

200

90

100

110

120

130

140

150

160

170

ELAPSED TEST TIME, HRS

TEMPERATURE PROFILE

AEPSC TEST AT CONAX CORP.

BEGINNING MARCH 31, 1978

Sheet 3 of 3

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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY;	14 DAYS	FSAR Table 2.5-2	5	Simul.	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 0-27	340	FSAR APP 0	5	Simul.	NONE
COMPONENT: Power CABLE	Pressure (PSIA)	Fig 0-27	119.7	FSAR APP 0	5	Simul.	NONE
MANUFACTURER: ANACONDA	Relative Humidity (%)	NA	100	NA	5	Simul.	NONE
MODEL NUMBER: Item # 3120	Chemical Spray	NA	3000 ppm b 172wt % boeic PH 9.5 Acid	NA	5	Simul.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	16.6	200	see note 1	5	Simul.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS							
LOCATION: Out of Containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Submergence	NA	NA	NA	NA	NA	NA

*Documentation References:

Notes:

S. FIRC TEST Report F.C 3341

 1) AEPSC NSPL CALCULATION (Ref 59)
DC-N-6420-2.

5. Qualified by Franklin Institute Research Laboratory
(FIRL) Test Report #F-C3341, Jan. 1973.

Type of Test: Simultaneous, gamma radiation
steam
chemical spray

Test Profile:

.51 Mrads/hr, 200 Mrads
340°F, 105 psig for 3 hrs
320°F, 75 psig for 3 hrs
250°F, 15 psig for 4 days
210°F, 5 psig for 9 days

Chemical Spray: Solution of boric acid
and Na OH , PH = 9.5



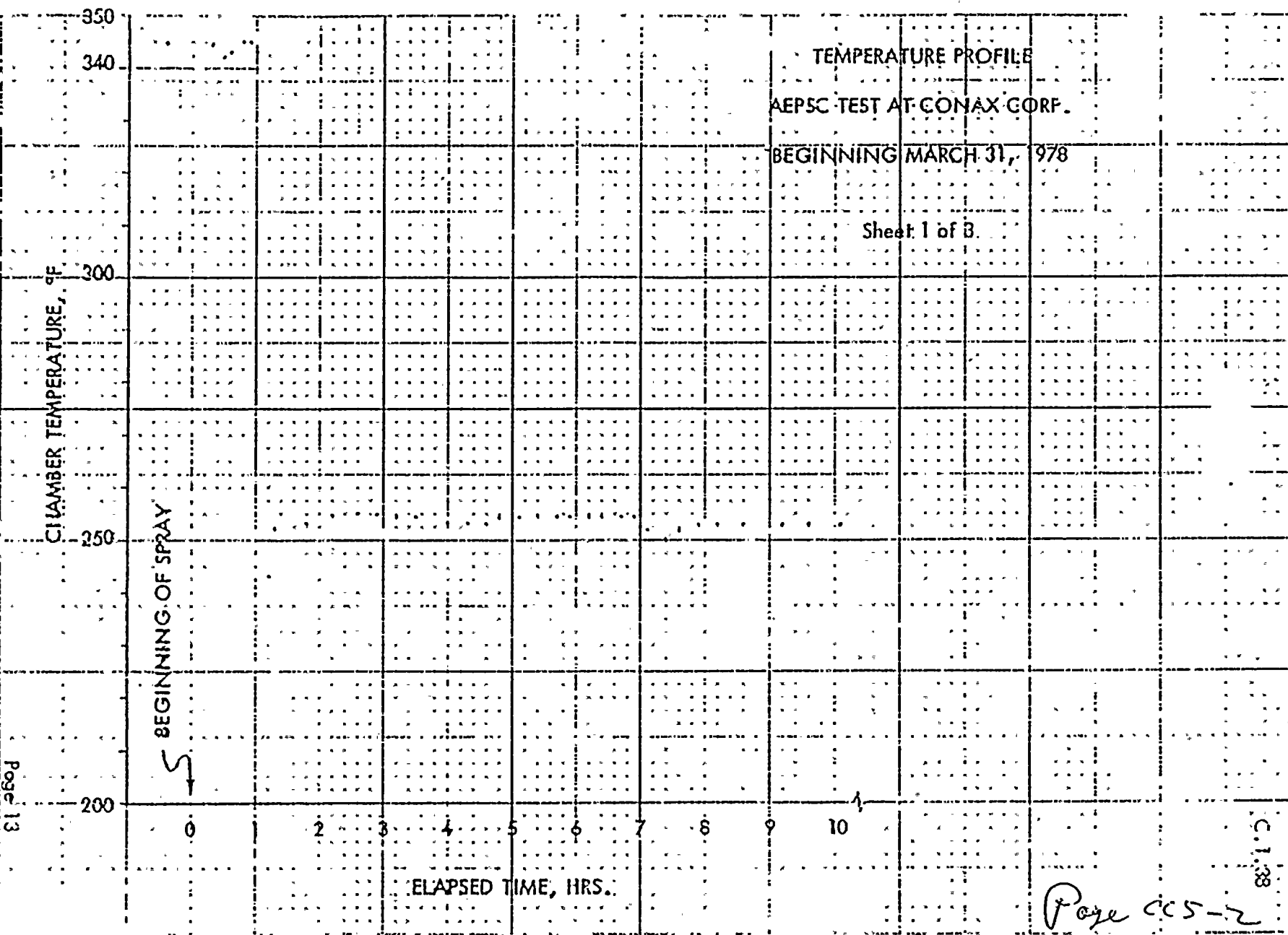
EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	24 hrs	116 hrs	FSAR Table 7.5-2	8	Seq	NONE
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	Fig 022.9-1, 2	345	FSAR APP Q	8	SEQ.	NONE
COMPONENT: <i>CONTROL CABLE</i>	Pressure (PSIA)	Fig. 2 Fig 1	121.7	ASD 6504	8	SEQ.	NONE
MANUFACTURER: <i>CONTINENTAL</i>	Relative Humidity (%)	100	100		8	SEQ.	NONE
MODEL NUMBER: <i>ITEM # 3121</i>	Chemical Spray	2000 ppm B 1.14 wt % Boric Acid PH 9-11	2500 ppm B 1.43 wt % Boric Acid PH 9-10	T.S. 31-1.5 3/15.6	8	SEQ.	NONE
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	28	150	WCAP 7410-L Vol 1	8	SEQ.	NONE
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	submerged	Floodup Tubes		61	COMBINATION	NONE
LOCATION: <i>IN + OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>1612</i> ABOVE FLOOD LEVEL: <i>NO</i>							

*Documentation References:

8. CONAX CORP. TEST REPORT IPS-348

61. Floodup Tube Qual. Packet

Notes:

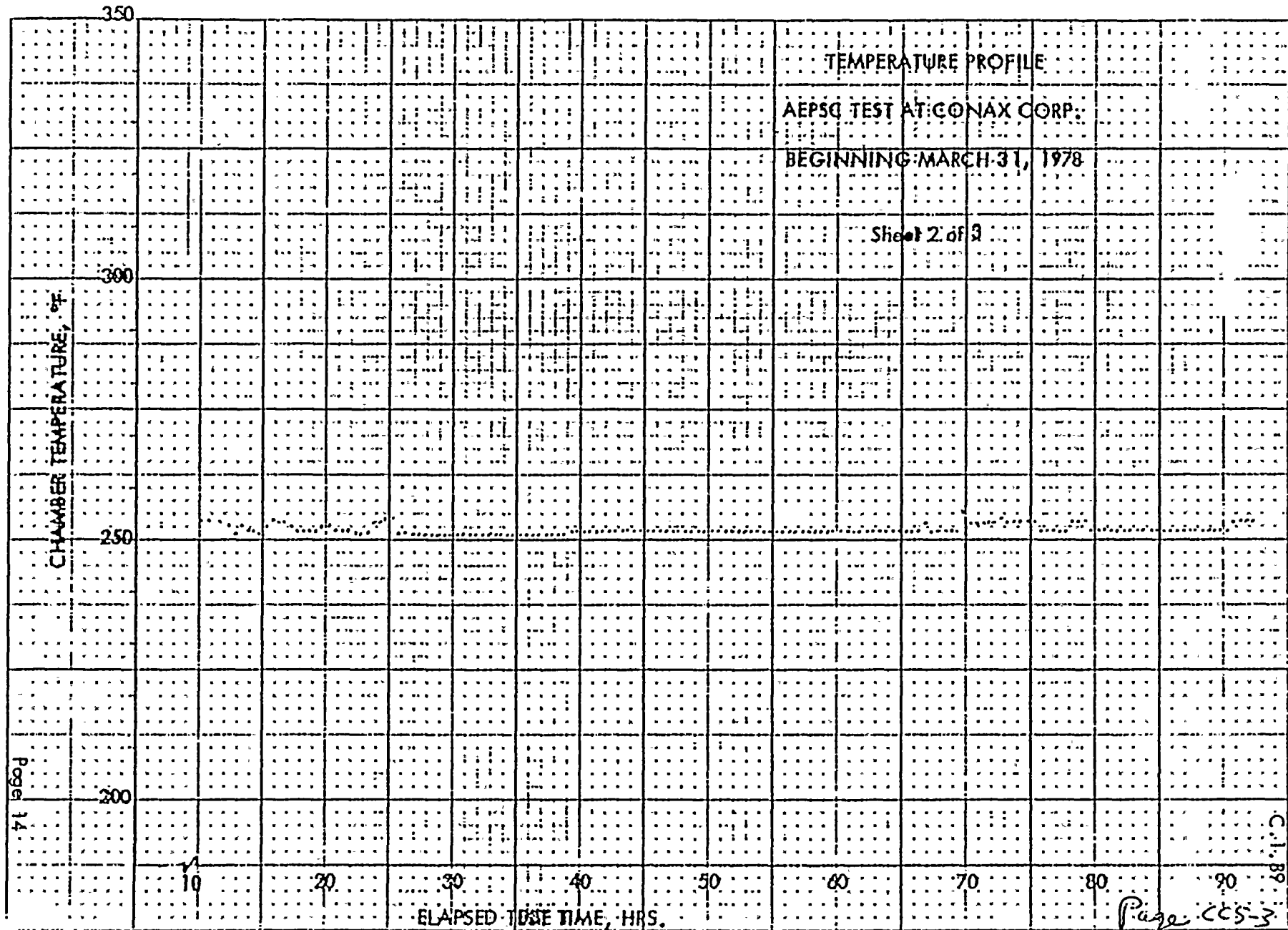


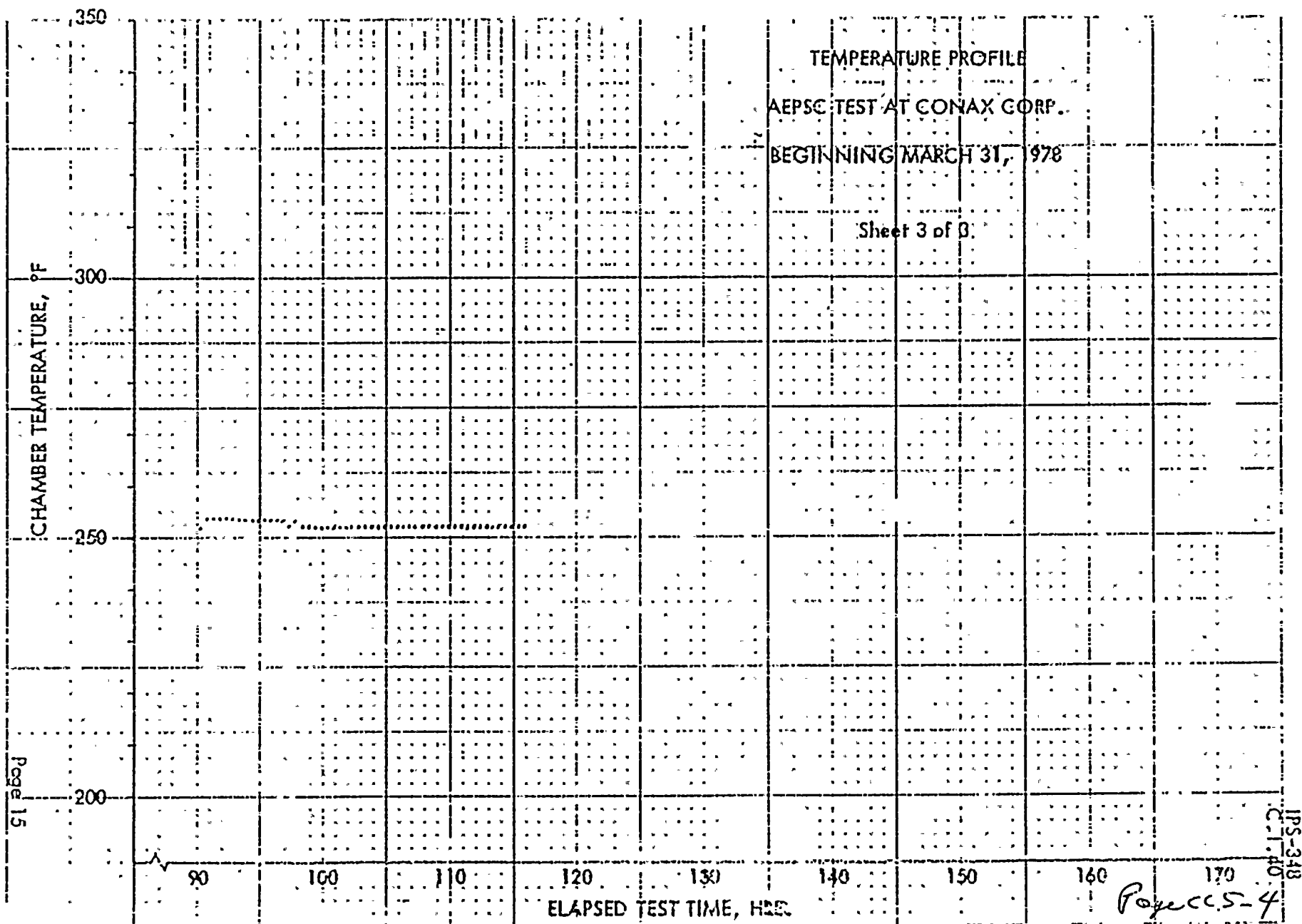
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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>Various</i>	Operating Time	<i>24 hrs.</i>	<i>116 hrs</i>	<i>Table 7.1-2 FSAR</i>	<i>8</i>	<i>Seq</i>	<i>NONE</i>
PLANT ID NO: <i>Various</i>	Temperature (°F)	<i>Fig 022.9-1, -2</i>	<i>345</i>	<i>FSAR APP Q</i>	<i>8</i>	<i>SEQ.</i>	<i>NONE</i>
COMPONENT: <i>CONTROL CABLE</i>	Pressure (PSIA)	<i>Fig. 2 Fig 1</i>	<i>121.7</i>	<i>ABW 6504</i>	<i>8</i>	<i>SEQ.</i>	<i>NONE</i>
MANUFACTURER: <i>GENERAL ELECTRIC</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>8</i>	<i>SEQ.</i>	<i>NONE</i>
MODEL NUMBER: <i>NEM # 3121</i>	Chemical Spray	<i>2000 ppm B 1.14 wt % Boric Acid pH 9-11</i>	<i>2500 ppm B 1.143 wt % Boric Acid pH 9-10</i>	<i>T.S. 314.5 3145.6</i>	<i>8</i>	<i>SEQ.</i>	<i>NONE</i>
FUNCTION: <i>Various</i>	Radiation (10 ⁶ rads)	<i>28</i>	<i>150</i>	<i>WCAP 7410-L Vol 1</i>	<i>8</i>	<i>SEQ.</i>	<i>NONE</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>Various</i>	Submergence	<i>submerged</i>	<i>FLOODUP Tubes</i>		<i>61</i>	<i>Combination</i>	<i>NONE</i>
LOCATION: <i>IN & OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>61.2'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

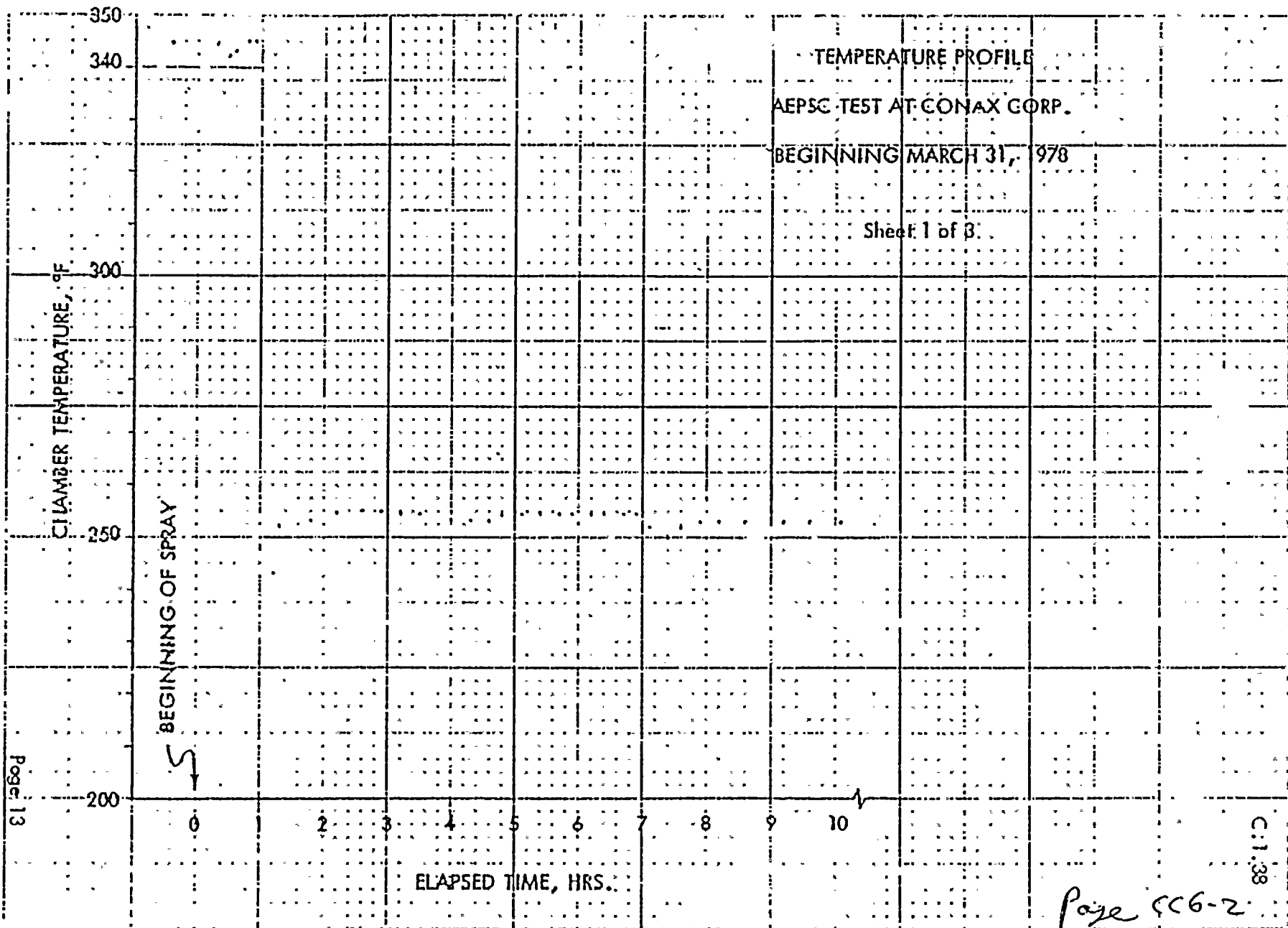
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OF 210
(0457)
49-3106
226 228
SII, LSI

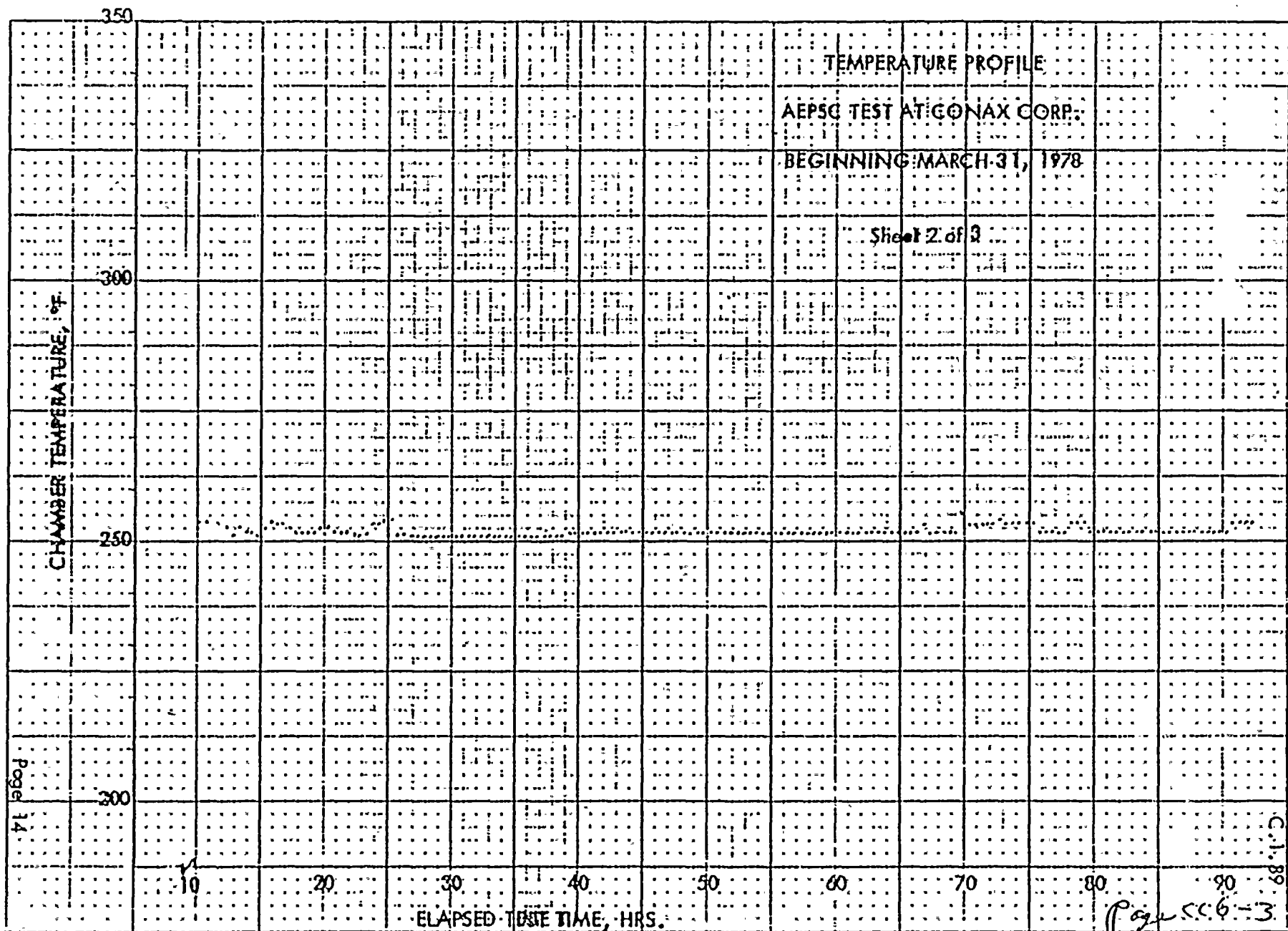
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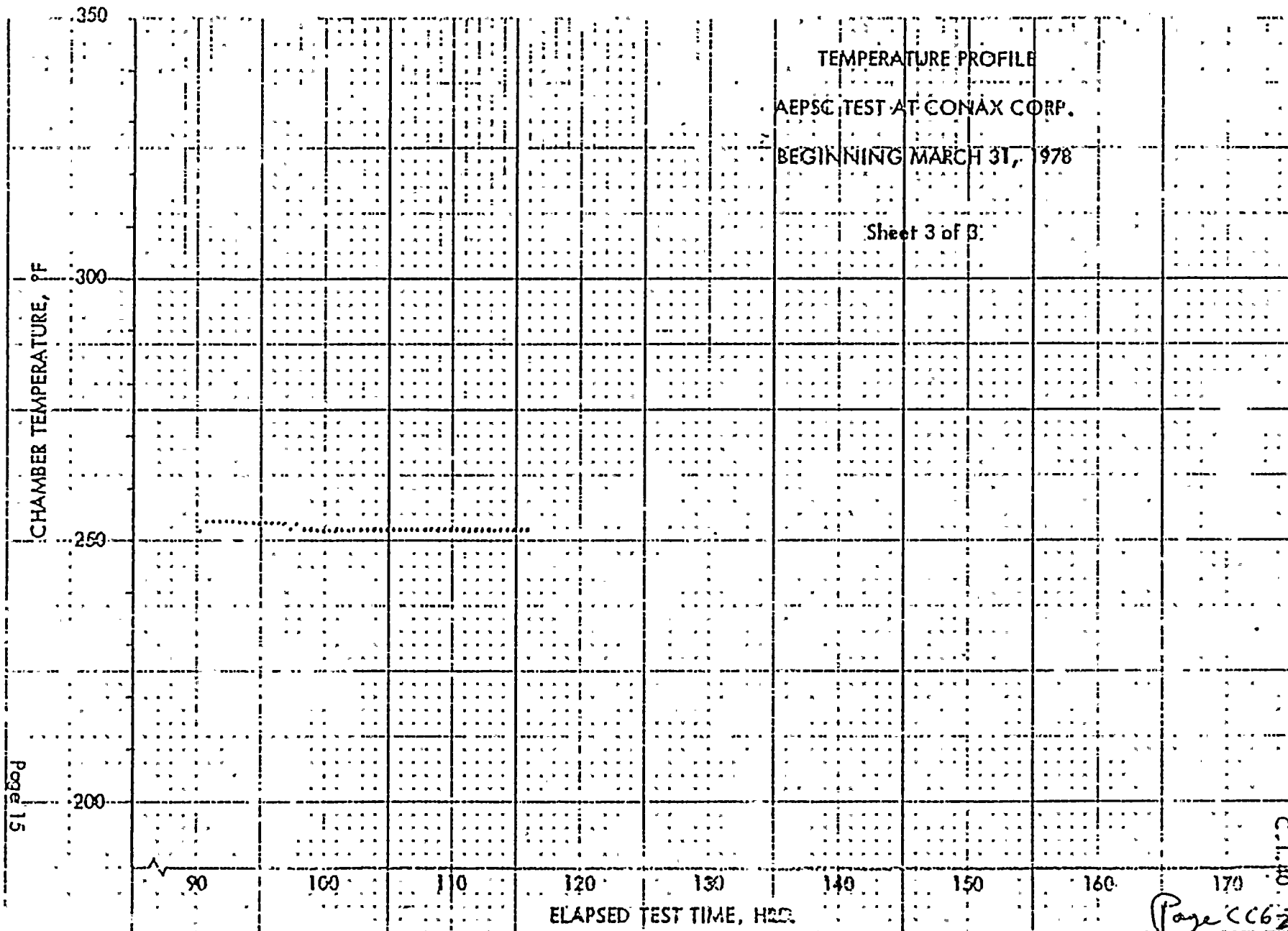
Notes:

8. CONAX CORP. TEST REPORT IPS-348

61. FLOODUP TUBE Qual. Packet







20

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>24 HOURS</i>	<i>116 HRS</i>	<i>Table 7.5-2</i>	<i>8</i>	<i>SEQ.</i>	<i>NONE</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 9 022.9-1, -2</i>	<i>345</i>	<i>FSAR APP Q</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
COMPONENT: <i>CONTROL CABLE</i>	Pressure (PSIA)	<i>Fig 2 Fig 1</i>	<i>121.7</i>	<i>ASRO 6504</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
MANUFACTURER: <i>CONTINENTAL</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>8</i>	<i>SEQ.</i>	<i>None</i>
MODEL NUMBER: <i>ITEM # 3122</i>	Chemical Spray	<i>2000 ppm B. 114 wt % Boric Acid pH 9-11</i>	<i>2500 ppm B. 114 wt % Boric Acid pH 9-10</i>	<i>T.S. 314.5 314.5.6</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>28</i>	<i>150</i>	<i>WCAP 7410-L Vol 1</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>submerged</i>	<i>FLOODUP Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>None</i>
LOCATION: <i>IN + OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

1-2 S7
7-8 S7
3-33 V6
35-38 V6
43-44 V6
47-50 V6
51-52 V6
53-54 V6
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61-62 V6
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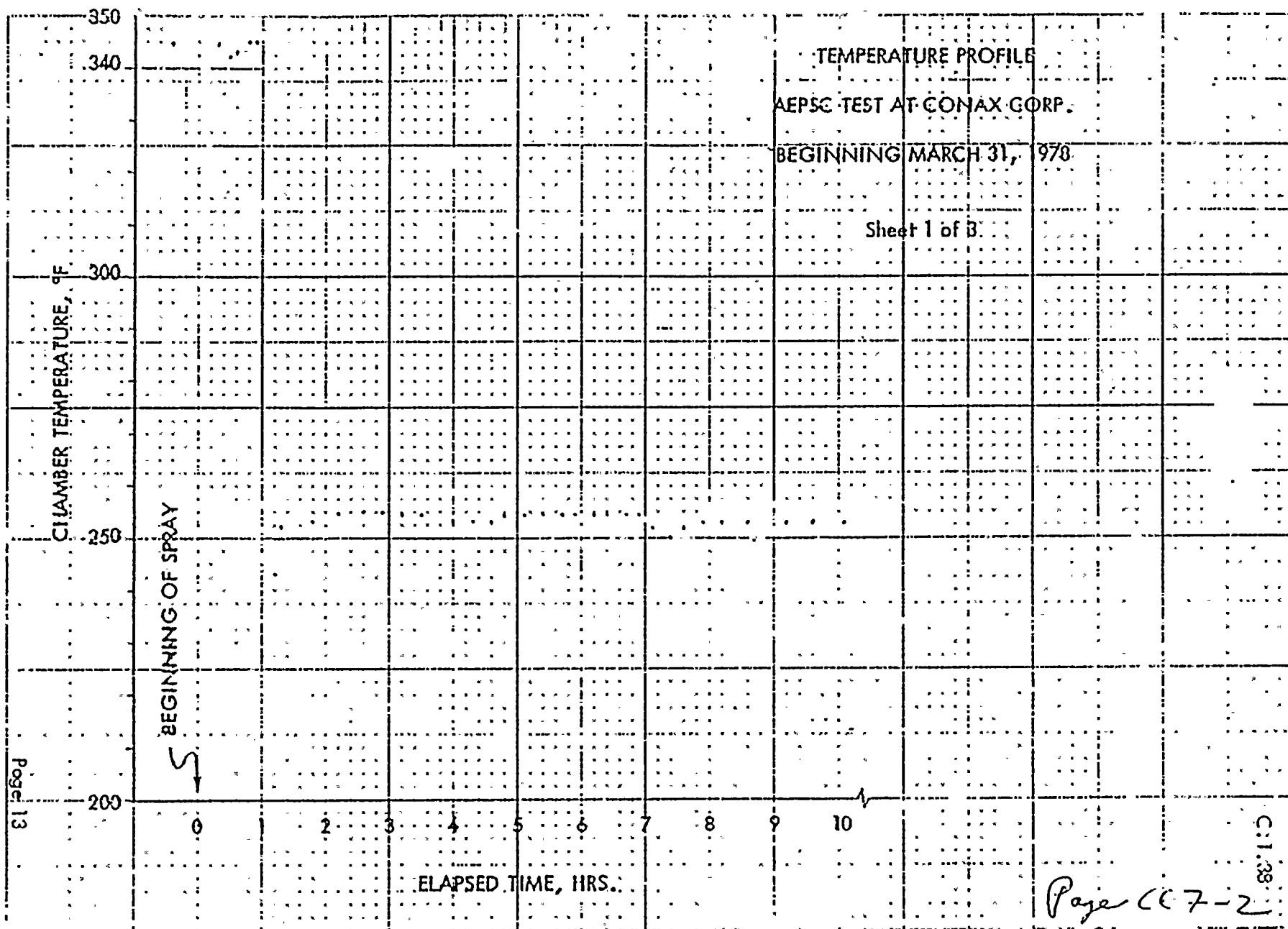
*Documentation References:

8. CONAX CORP. TEST REPORT IPS-348

61. FLOODUP Tube Qual. Packet.

Notes:

1. EXCEPT for CABLES ON VCR-11, 21, 101, 102, 103, 104, 105, 106 & 107 AND NMN-151, 152 & 153. See Cable N.C. 1.



TEMPERATURE PROFILE

AEPSC TEST AT CONAX CORP.

BEGINNING MARCH 31, 1978

Sheet 1 of 3

CHAMBER TEMPERATURE, °F

BEGINNING OF SPRAY

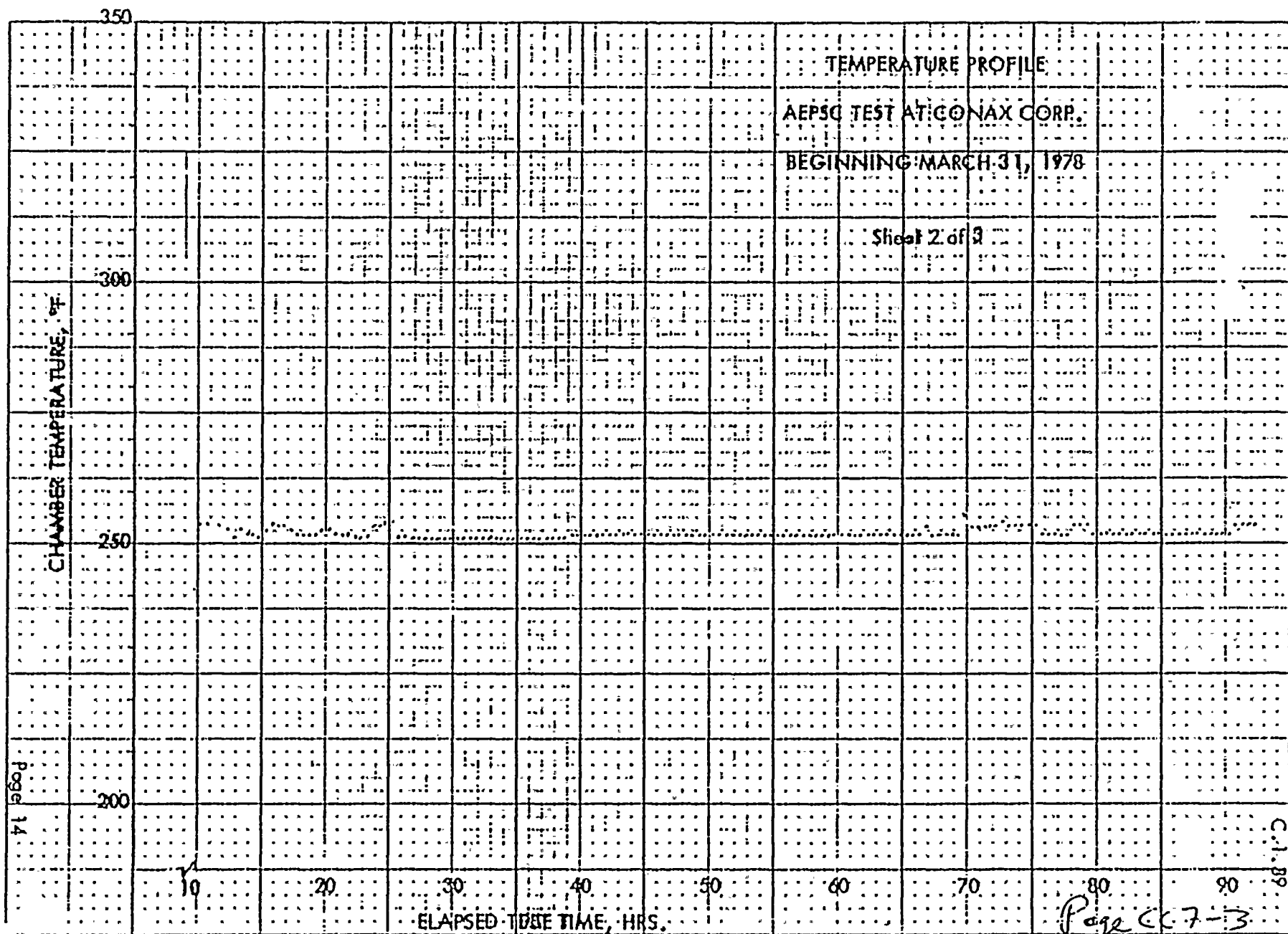
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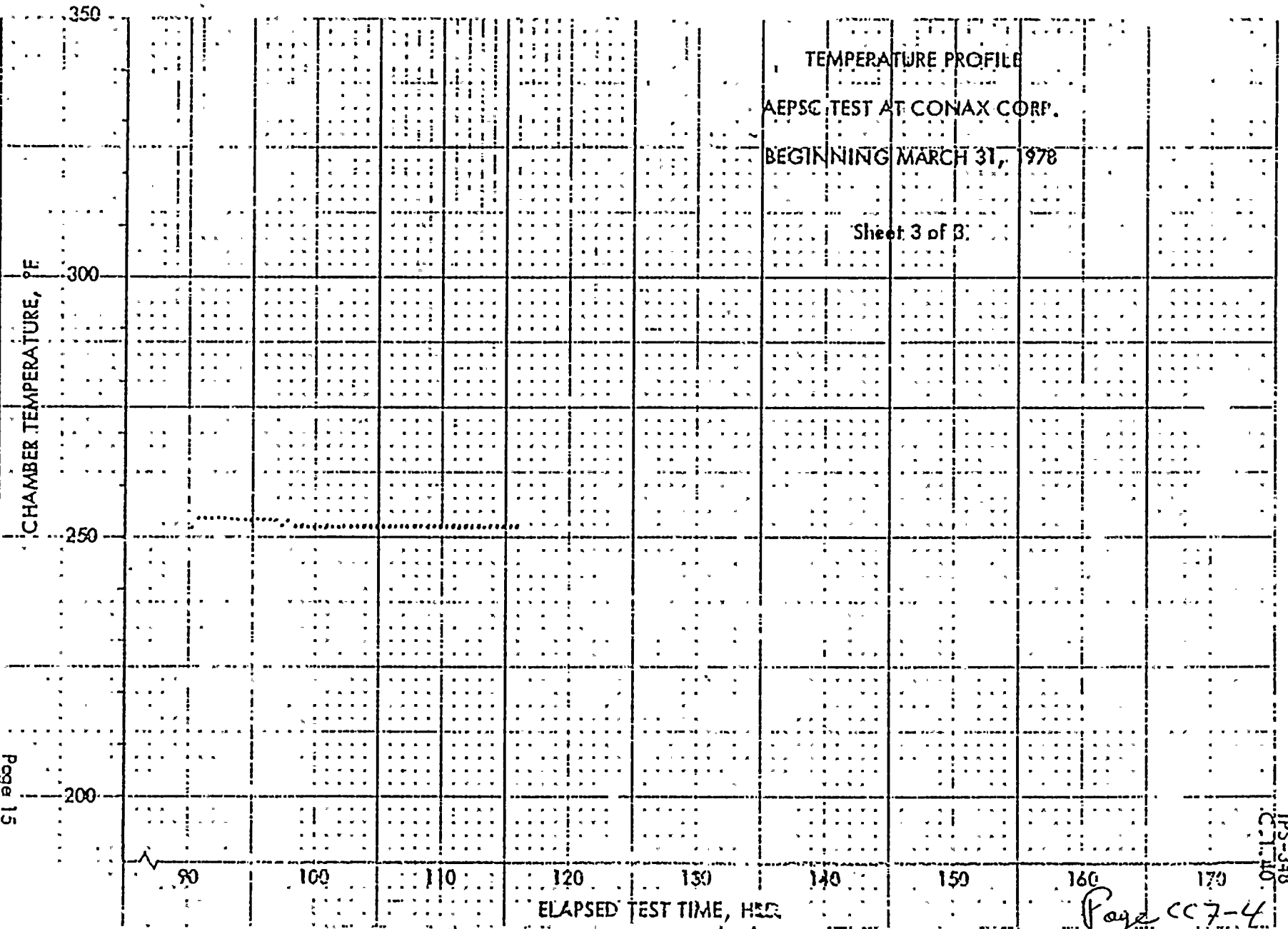
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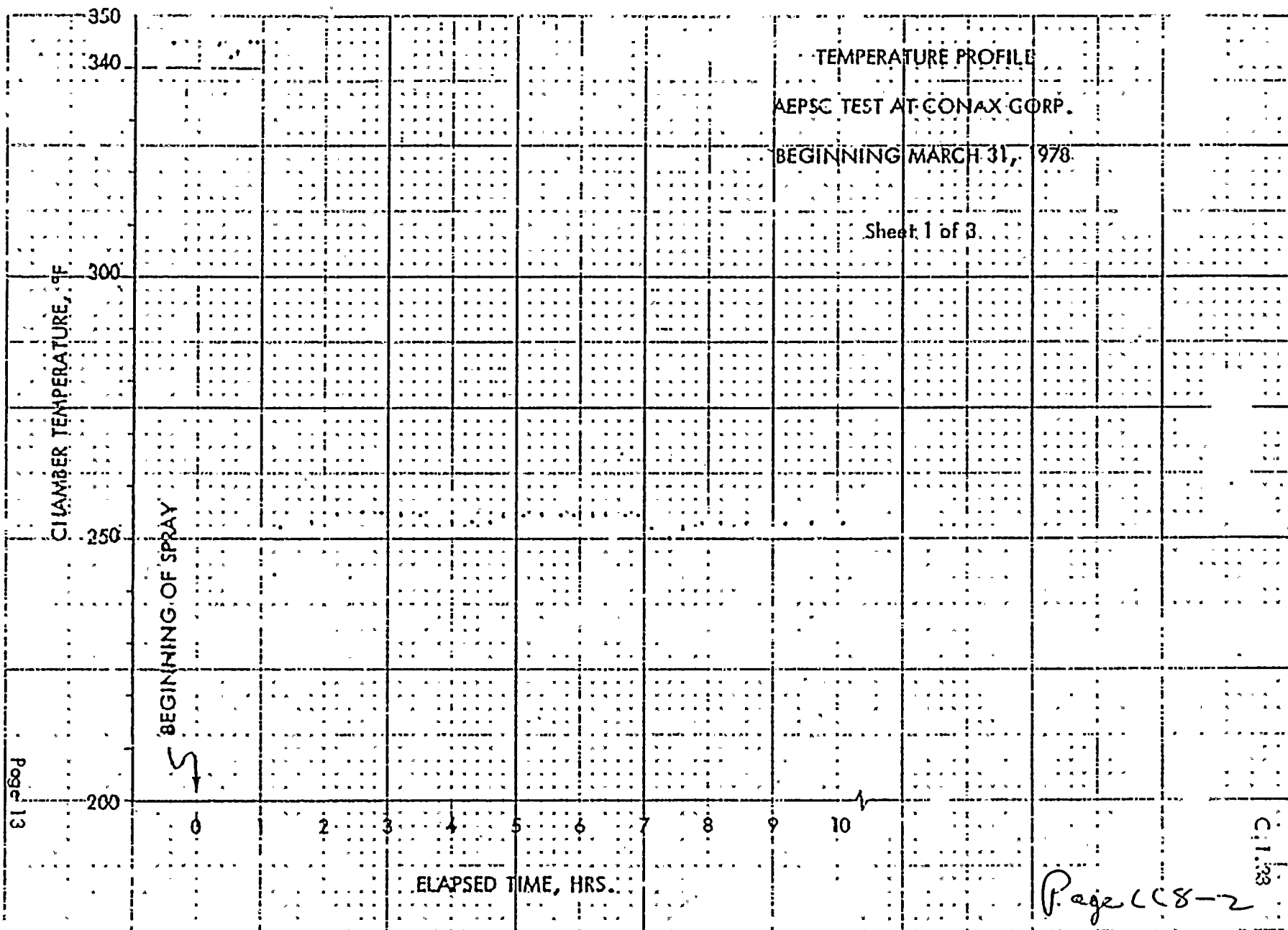
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	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>24 HRS</i>	<i>116 HRS</i>	<i>FSAB Table 7.5.2</i>	<i>8</i>	<i>Seq</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 022.9-1, -2</i>	<i>345</i>	<i>FSAB APP 9</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
COMPONENT: <i>CONTROL CABLE</i>	Pressure (PSIA)	<i>FIG. 2 Fig 1</i>	<i>121.7</i>	<i>NEW 6504</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
MANUFACTURER: <i>GENERAL ELECTRIC</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>8</i>	<i>SEQ.</i>	<i>None</i>
MODEL NUMBER: <i>ITEM # 3122</i>	Chemical Spray	<i>2000 ppmB 1.14% wt Boric PH 9-11 Acid</i>	<i>2500 ppmB 1.43% wt Boric PH 9-10 Acid</i>	<i>T.S. 314.5 314.5.6</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>28</i>	<i>150</i>	<i>WCAP 7410-L Vol 1</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>Submerged</i>	<i>* Flooded Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>None</i>
LOCATION: <i>IN + OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

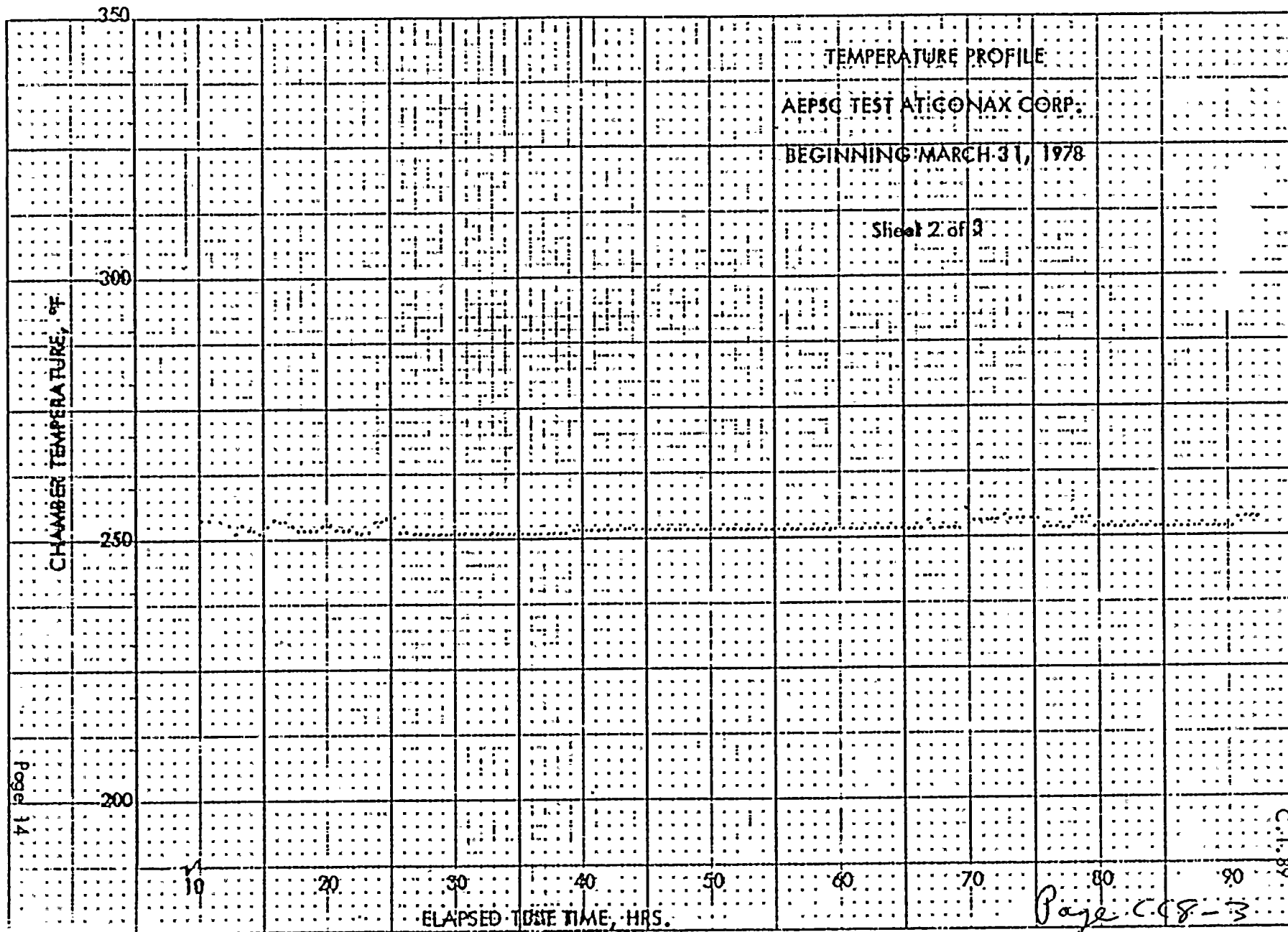
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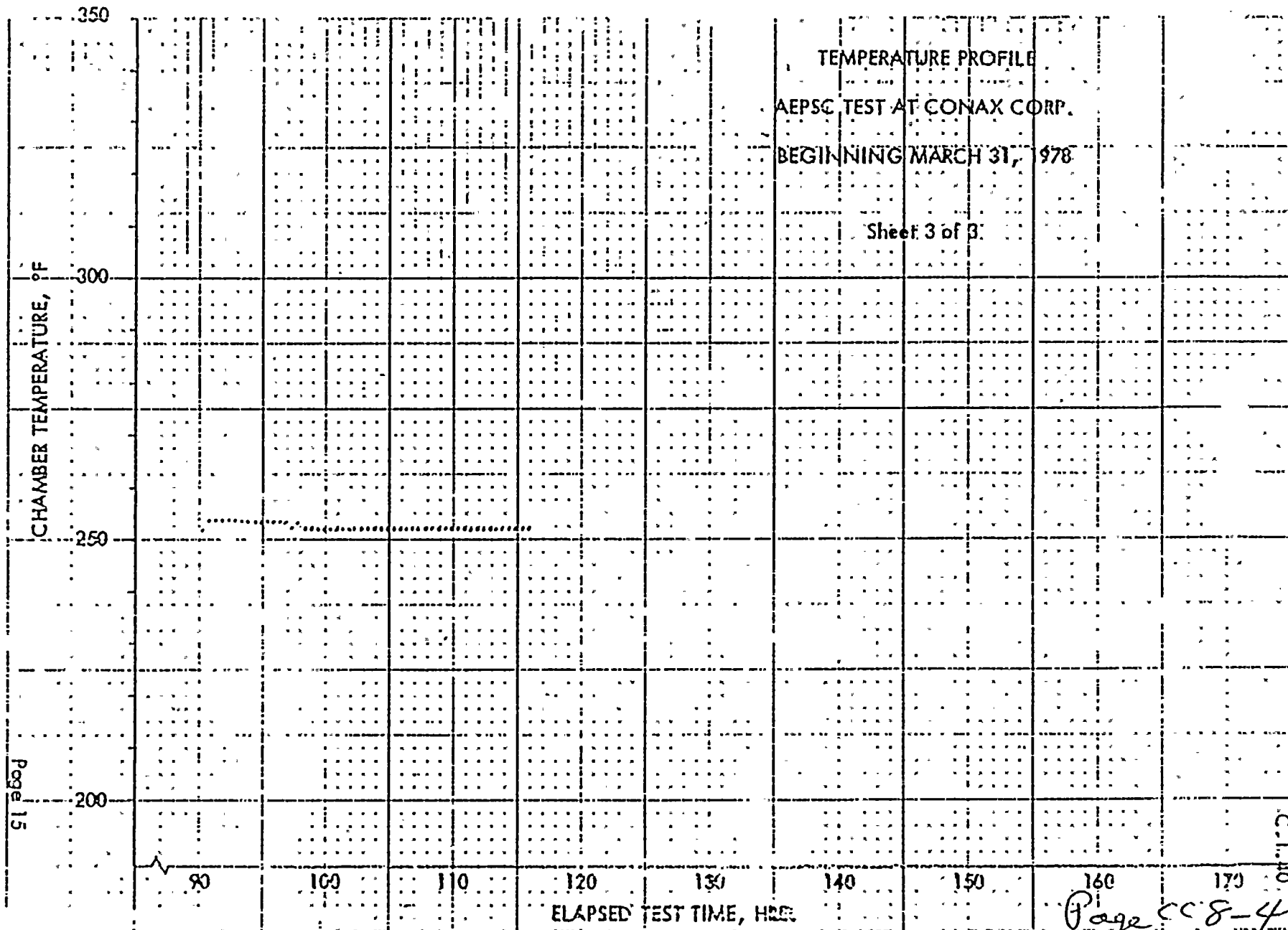
8. CONAX CORP. TEST REPORT IPS-348
61. Flood Tube Qual. Packet

Notes:

** EXCEPT for CABLES ON VCR-11, 21, 101, 102, 103, 104, 105, 106
#107 AND NMO-101, 102, & 103. See Cable Note 2.*







EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>24 hrs</i>	<i>116 hrs</i>	<i>Note A Below</i>	<i>8</i>	<i>Seq</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 0-27</i>	<i>345</i>	<i>FSAR APP 0</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
COMPONENT: <i>CONTROL CABLE</i>	Pressure (PSIA)	<i>Fig 0-27</i>	<i>121.7</i>	<i>FSAR APP 0</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
MANUFACTURER: <i>CONTINENTAL</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>	<i>NA</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
MODEL NUMBER: <i>ITEM # 3123</i>	Chemical Spray	<i>NA</i>	<i>2500 ppmB 143wt % Boric acid 9-10 Acid</i>	<i>NA</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>16.6</i>	<i>150</i>	<i>See Note 1</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
LOCATION: <i>OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>NA</i> ABOVE FLOOD LEVEL:							

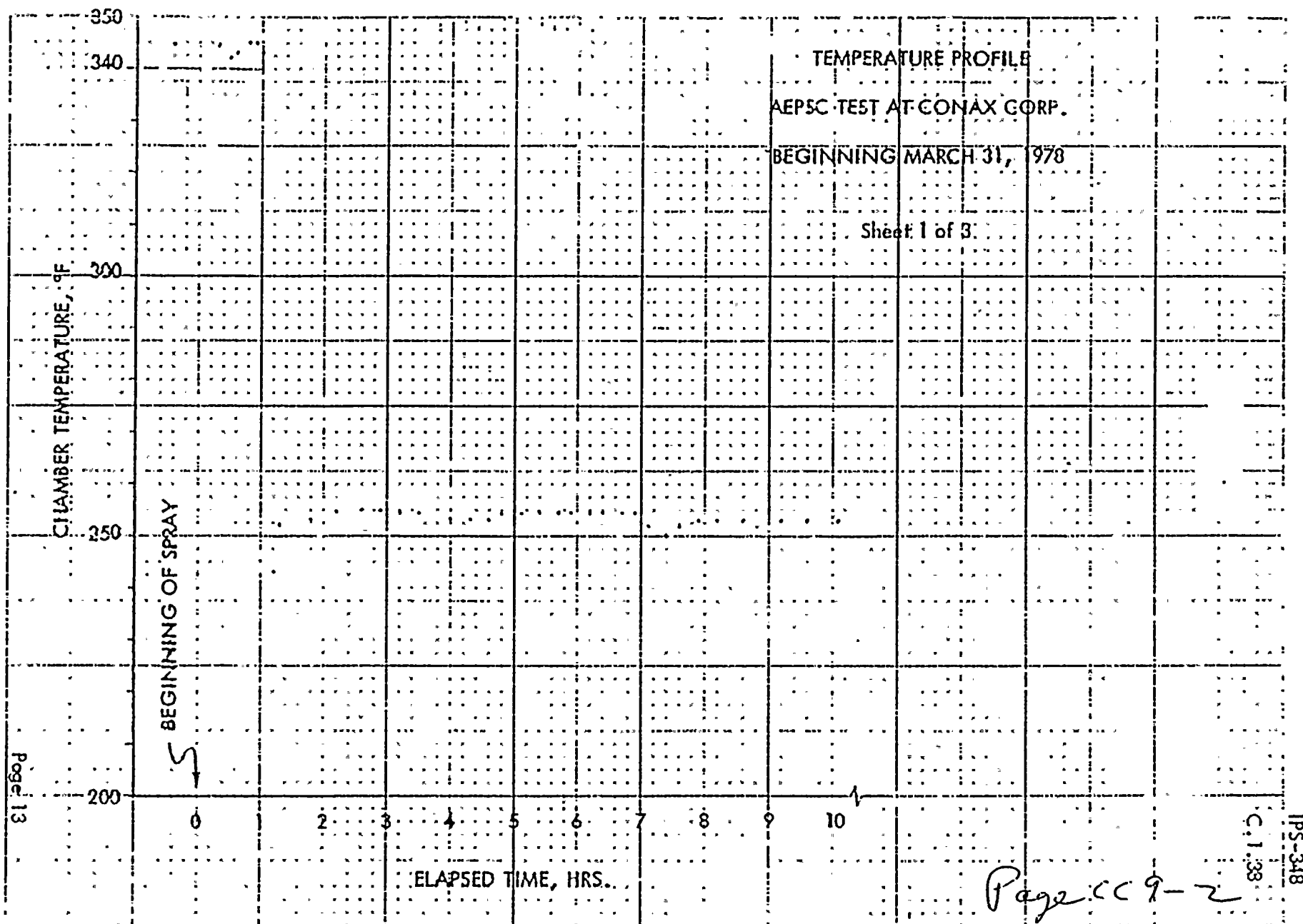
***Documentation References:**

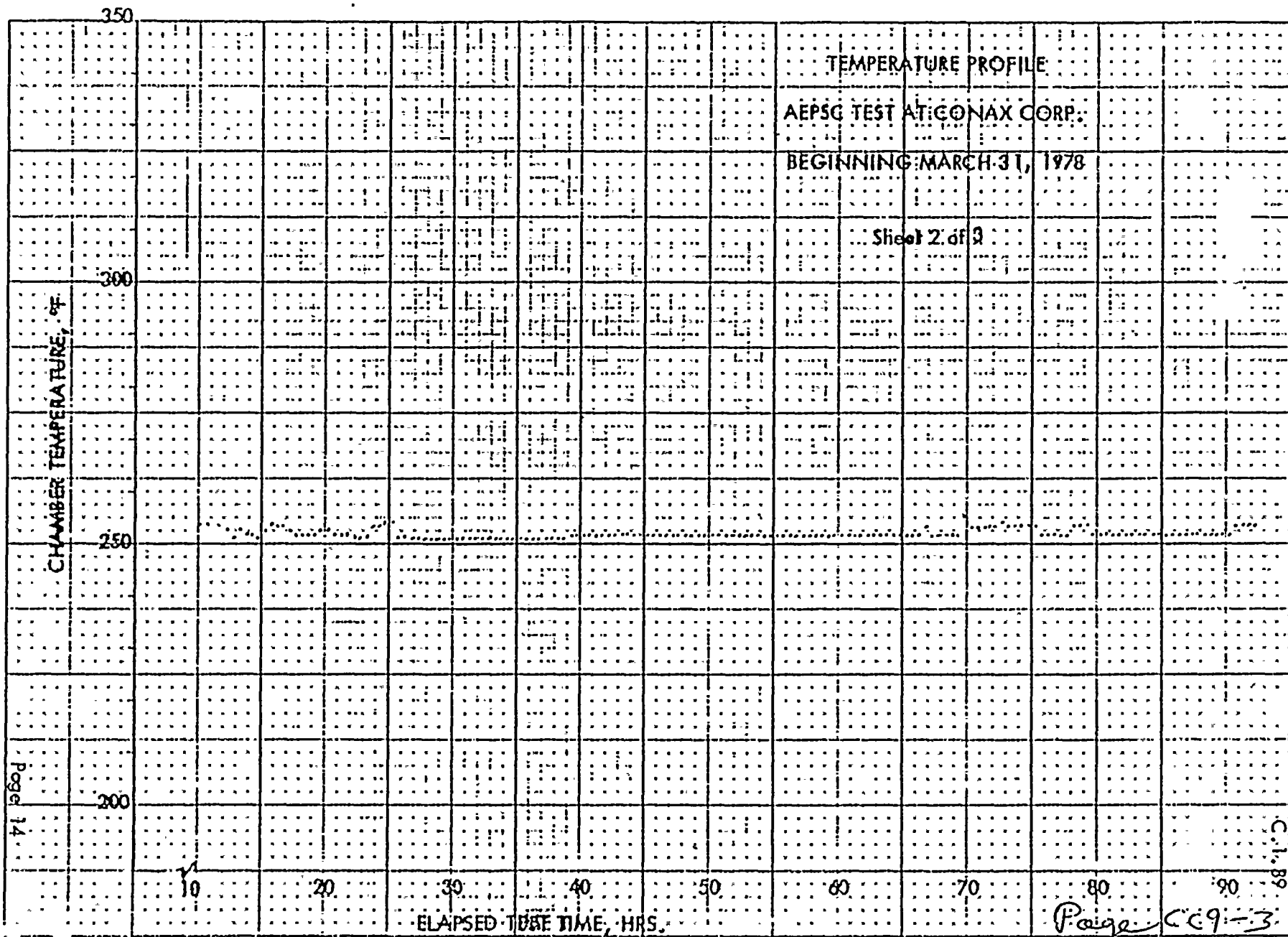
8. CONAX CORP. TEST REPORT IPS-3VB

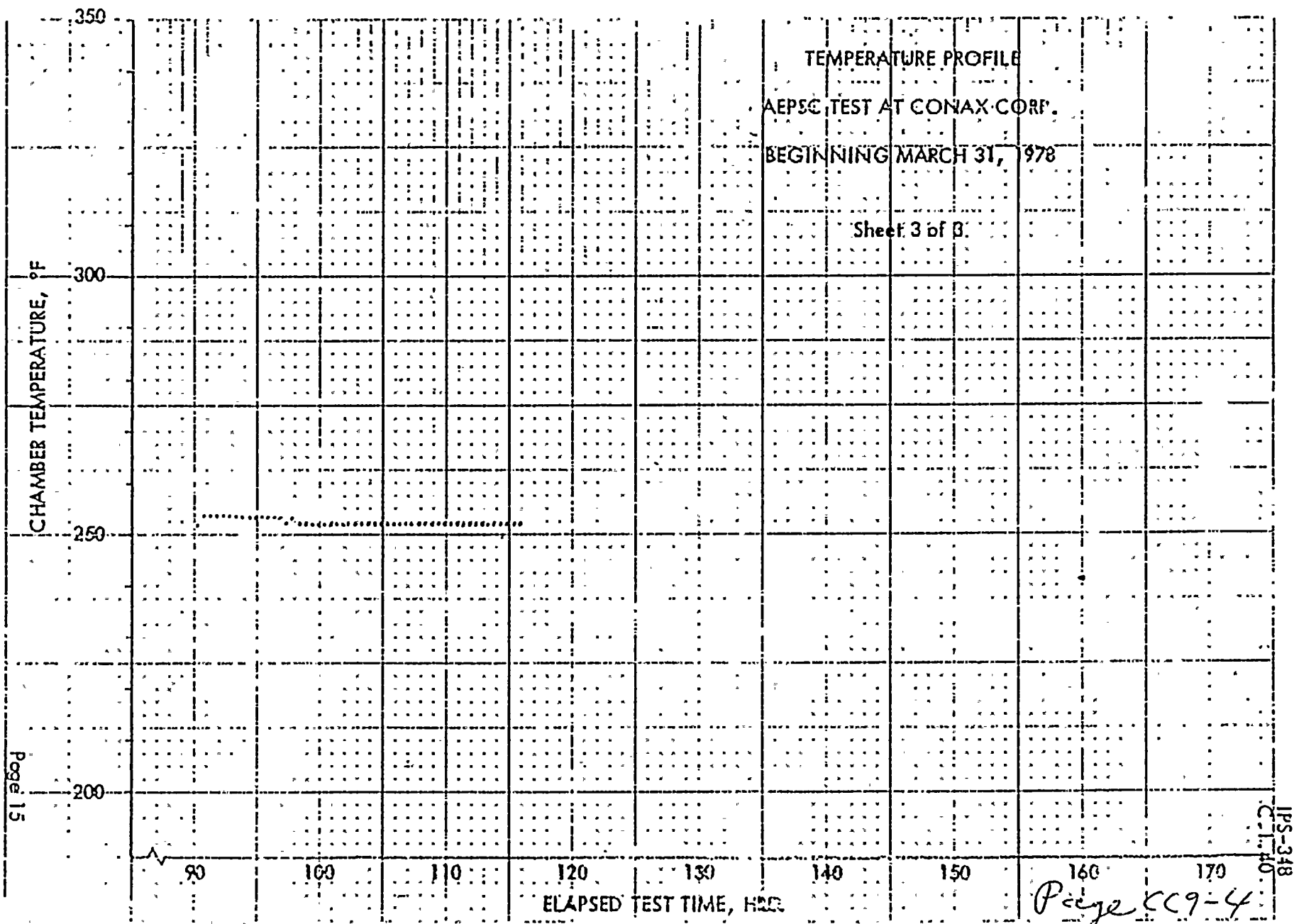
Notes:

Notes: letters of Tillinghast (AEP) to K. Kniel (NRC)
dated 4-14-75 and 9-29-75

1) AEPSC NSPL CALCULATION (Ref 59)
DC-N-6420-2







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C-1-10



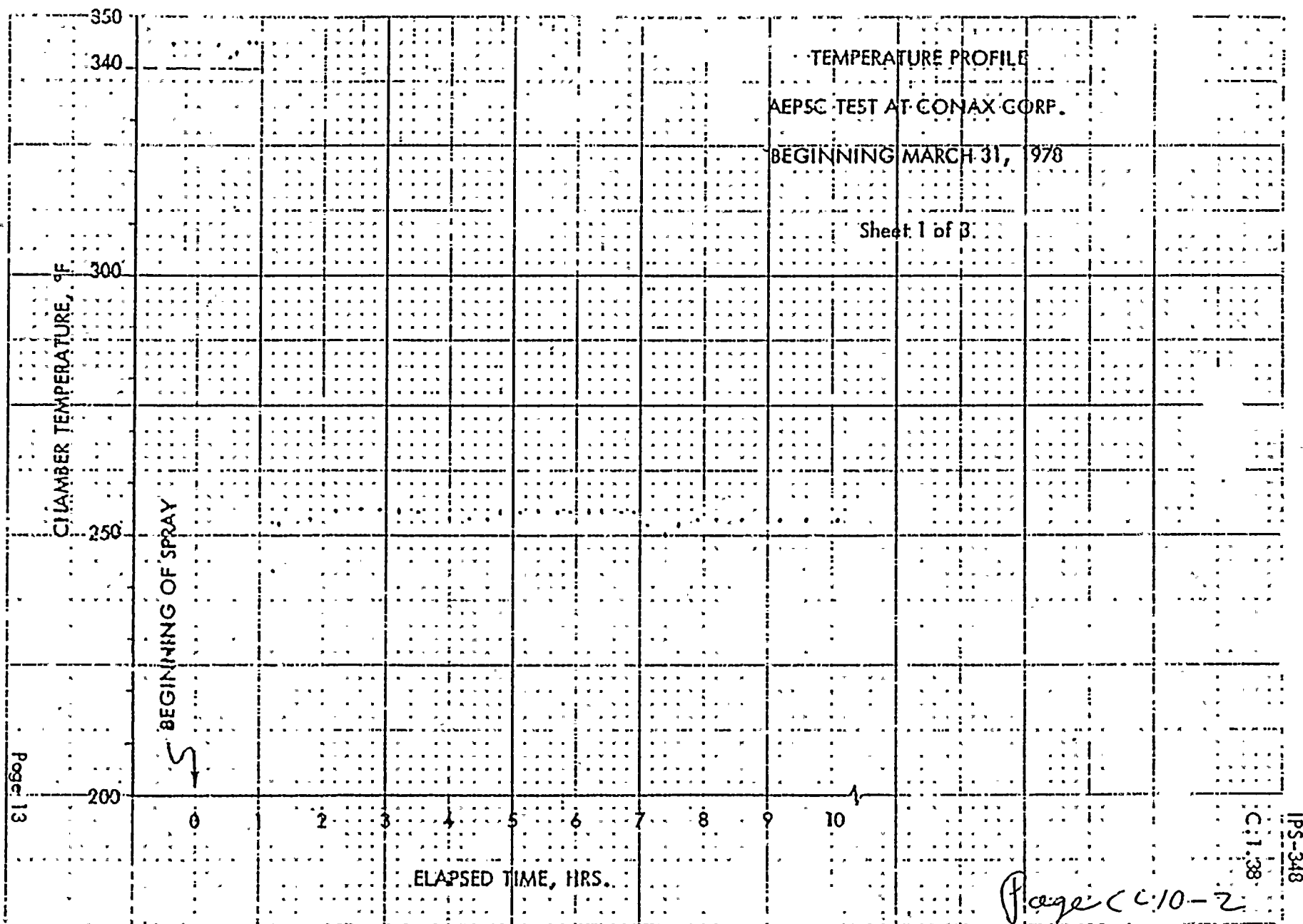
EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>24 hrs</i>	<i>116 hrs.</i>	<i>see note below</i>	<i>8</i>	<i>Seq.</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 0-27</i>	<i>345</i>	<i>FSAR APP 0</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
COMPONENT: <i>CONTROL CABLE</i>	Pressure (PSIA)	<i>Fig 0-27</i>	<i>121.7</i>	<i>FSAR APP 0</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
MANUFACTURER: <i>GENERAL ELECTRIC</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>	<i>NA</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
MODEL NUMBER: <i>ITEM # 3123</i>	Chemical Spray	<i>NA</i>	<i>2500 ppmB 1.43%wt Boric PH 9-10 Acid</i>	<i>NA</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>16.6</i>	<i>150</i>	<i>see note 1</i>	<i>8</i>	<i>SEQ.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
LOCATION: OUT OF <i>OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>NA</i> ABOVE FLOOD LEVEL:							

*Documentation References:

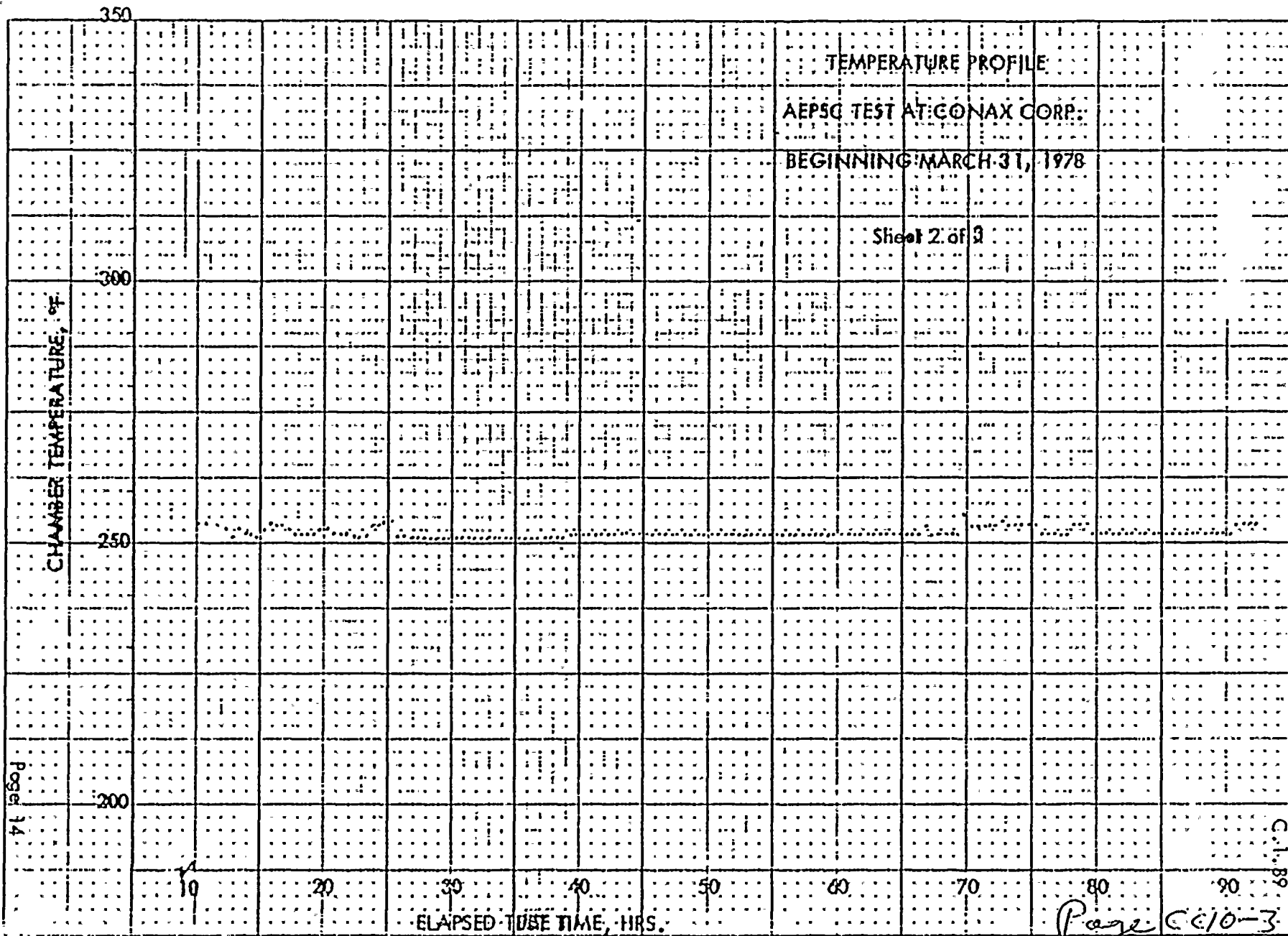
8. CONAX REP. TEST REPORT IPS-34B

NOTES:

A) letters J. Tillinghast (AER) to K. K. Miel (NRC)
dated 4-14-75 to 9-29-75AERSC NS&L CALCULATION
DC-N-6420-2 (Ref 59)







CHAMBER TEMPERATURE, °F

350

300

250

200

90

100

110

120

130

140

150

160

170

ELAPSED TEST TIME, HRS

TEMPERATURE PROFILE

AEPSC TEST AT CONAX CORP.

BEGINNING MARCH 31, 1978

Sheet 3 of B

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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 year</i>		<i>FA 2 Table 2.5-2</i>	<i>7</i>	<i>Seq</i>	<i>NA</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 0-27</i>	<i>325</i>	<i>FSAR APP 0</i>	<i>7</i>	<i>SEQ.</i>	<i>NA</i>
COMPONENT: <i>Power Cable</i>	Pressure (PSIA)	<i>Fig 0-27</i>	<i>96.7</i>	<i>FSAR APP 0</i>	<i>7</i>	<i>SEQ.</i>	<i>NA</i>
MANUFACTURER: <i>KERITE</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>	<i>NA</i>	<i>7</i>	<i>SEQ.</i>	<i>NA</i>
MODEL NUMBER: <i>Item # 3127</i>	Chemical Spray	<i>NA</i>	<i>2600 ppm 12% NaOH 9.5 Acid</i>	<i>NA</i>	<i>7</i>	<i>SEQ.</i>	<i>NA</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>17</i>	<i>200</i>	<i>see note 3</i>	<i>see note 1</i>		<i>NA</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)	<i>40</i>	<i>70</i>		<i>see note 1</i>		<i>NA</i>
SERVICE: <i>VARIOUS</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
LOCATION: <i>Out of Control mat</i>							
FLOOD LEVEL ELEV: <i>NA</i>							
ABOVE FLOOD LEVEL: <i>NA</i>							

SEE CP-11

*Documentation References:

7. Kerite Co. Report on the Effects of GAMMA RAD.
AND Autoclaving on Kerite Power & Control
CABLE.

Notes: 1. Letter from Robert Henry (Kerite) to C. Cook (NEP)
of 11-18-80.

2. Cable Temp rating 194°F. 230°F for 10 sec
and 11.5 psig for 1 sec does not represent a
challenge to the mechanical elect. quality of the cable

3. NEPSC NS&L CALCULATION
DC-N-6120-2.

VOID
Refer To PAGE CP-11-1

7. Qualified by Kerite Co. Report on the effects of Gamma Radiation
April 30, 1970.

and autoclaving on Kerite America Control Cables

Type of Test: Sequential, gamma radiation
steam
chemical spray

Test Profile:

.8 Mrads/hr, 120 Mrads
325°F, 32 psig for 13 hrs
228°F, 5 psig for 7 days

Chemical Spray: Borated water, 1-1/2% solution of
boric acid and distilled water
buffered at a PH of 9.5

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>4 mo.</i>	<i>>44 mo.</i>	<i>Table 7.5-2 FSAR APP N</i>	<i>63 31</i>	<i>Combination</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 13.13-1</i>	<i>290</i>	<i>FSAR APP N</i>	<i>31</i>	<i>Seq.</i>	<i>None</i>
COMPONENT: <i>Instrument CABLE</i>	Pressure (PSIA)	<i>Fig 13.6-1 13.6-2</i>	<i>59.7</i>	<i>FSAR APP N</i>	<i>31</i>	<i>Seq.</i>	<i>None</i>
MANUFACTURER: <i>Boston Insulated Wire Co.</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>31</i>	<i>Seq.</i>	<i>None</i>
MODEL NUMBER: <i>Item # 3064</i>	Chemical Spray	<i>2000 ppm B 1:14 wt % Boric Acid PH 9-11</i>	<i>2000 ppm B 1:14 wt % Boric Acid PH 8-8.5</i>	<i>T.S. 3/4.5 3/4.5.6</i>	<i>32</i>	<i>Seq.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>95</i>	<i>200</i>	<i>WCAP 7410-L VOL I</i>	<i>32</i>	<i>Seq.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>submerged</i>	<i>Flooded Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>None</i>
LOCATION: <i>In and Out Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

*Documentation References:

31. BIW Test Report 73C212

32. BIW Test Report 75C008

61. FLOODUP Tube Qual. Packet

63. Required Time Qual. Analysis

Notes:

* EXCEPT FOR CABLE FOR VCR-21. See Call. Note 2a.

31. BOSTON INSULATED WIRE CO.
TEST NO. 73C212

Item # 3064

Test type: Sequential

RADIATION: 100 MRADS

Profile:

290°, 45psig, 12 hr

220°, 5psig, 7 DAYS

Chem Spray: 1800 ppm B

Page CI 1-2



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>4 mo.</i>	<i>>4.4 mo.</i>	<i>Table 7.5-2 FSAR</i>	<i>b3 34</i>	<i>Combination</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 022.9-1, 2</i>	<i>346</i>	<i>FSAR APP Q</i>	<i>34</i>	<i>Seq.</i>	<i>None</i>
COMPONENT: <i>Instrument CABLE</i>	Pressure (PSIA)	<i>Fig 1 FIG. 2</i>	<i>127.7</i>	<i>AEW 6504</i>	<i>34</i>	<i>Seq.</i>	<i>None</i>
MANUFACTURER: <i>Rockbestos</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>34</i>	<i>Seq.</i>	<i>None</i>
MODEL NUMBER: <i>Item # 3064</i>	Chemical Spray	<i>2000 ppm B 1.14 wt % Boric Acid 049-11</i>	<i>3000 ppm B 1.72 wt % Boric Acid 049-11</i>	<i>T.S. 314.5 314.5.6</i>	<i>34</i>	<i>Seq.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>95</i>	<i>200</i>	<i>WCAP 7410-2 VOL1</i>	<i>34</i>	<i>Seq.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>submerged</i>	<i>* FLOODUP Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>None</i>
LOCATION: <i>IN AND OUT Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>D₀</i>							

*Documentation References:

34. Rockbestos. QUAL. of Firewall III CLASS I
ELECTRIC CABLE MAY, 1976

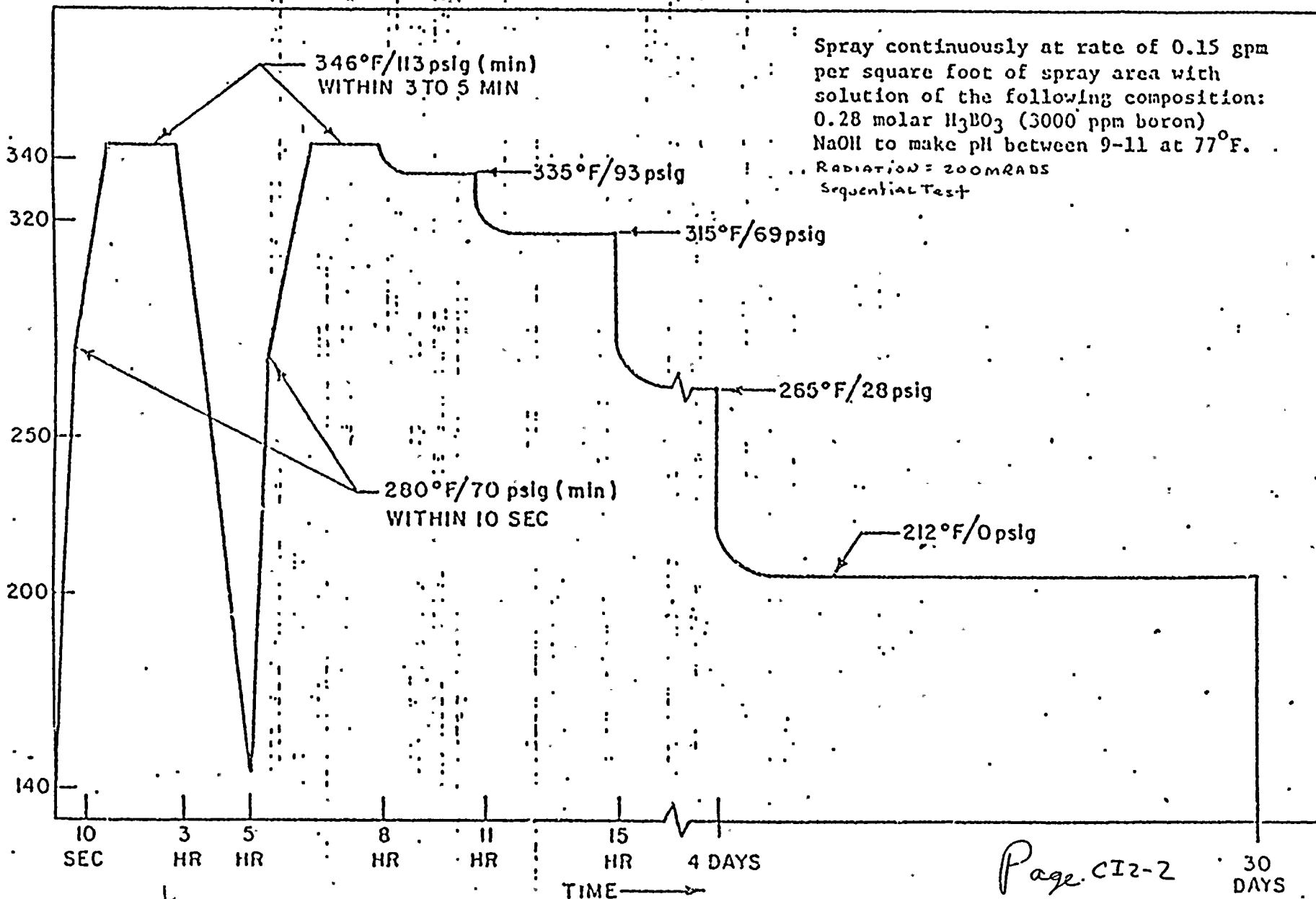
61. FLOODUP TUBE Quali Packet

63. Required Time Qual Analysis

Notes:

* EXCEPT FOR CABLES ON VCR-21. See Cable Note J.

LOCA Profile



LOCA PROFILE

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>4mo.</i>	<i>>4mo.</i>	<i>Table 7.5-2 FSAR</i>	<i>63 10</i>	<i>Combination</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 022.9-1, 2</i>	<i>340</i>	<i>FSAR APP Q</i>	<i>10</i>	<i>SEP.</i>	<i>None</i>
COMPONENT: <i>INSTRUMENT CABLE</i>	Pressure (PSIA)	<i>Fig 1 Fig 2</i>	<i>119.7</i>	<i>ASFO 6504</i>	<i>10</i>	<i>SEP.</i>	<i>None</i>
MANUFACTURER: <i>SANUEL HOWE & CO.</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>10</i>	<i>SEP.</i>	<i>None</i>
MODEL NUMBER: <i>ITEM# 3075</i>	Chemical Spray	<i>2000ppmB 1.14wt% Boric 049-11 Acid</i>	<i>3000ppmB 1.72wt% Boric 049-11 Acid</i>	<i>T.S. 314.5 314.5.6</i>	<i>11</i>	<i>SEP.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>95</i>	<i>200</i>	<i>WCAP 3410-L VOL 1</i>	<i>10</i>	<i>SEP.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>Submerged</i>	<i>* Floodup Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>None</i>
LOCATION: <i>IN & OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

*Documentation References:

10. FIRC TEST REPORT F-C3683
11. ISOMEDIX CORP. TEST REPORT OF MAY, 1976
61. FLOODUP TUBE Qual. Packet
63. Required Time Qual. Analysis

Notes:

*EXCEPT FOR CABLES ON NTA-140, MFC-110, 111, 120, 121, 130, 131, 140, 141, See Cable Note 1.

THERMAL AGING AND RADIATION EXPOSURE

LOSS-OF-COOLANT ACCIDENT SIMULATION

POST LOCAL
RADIATION
EXPOSURE

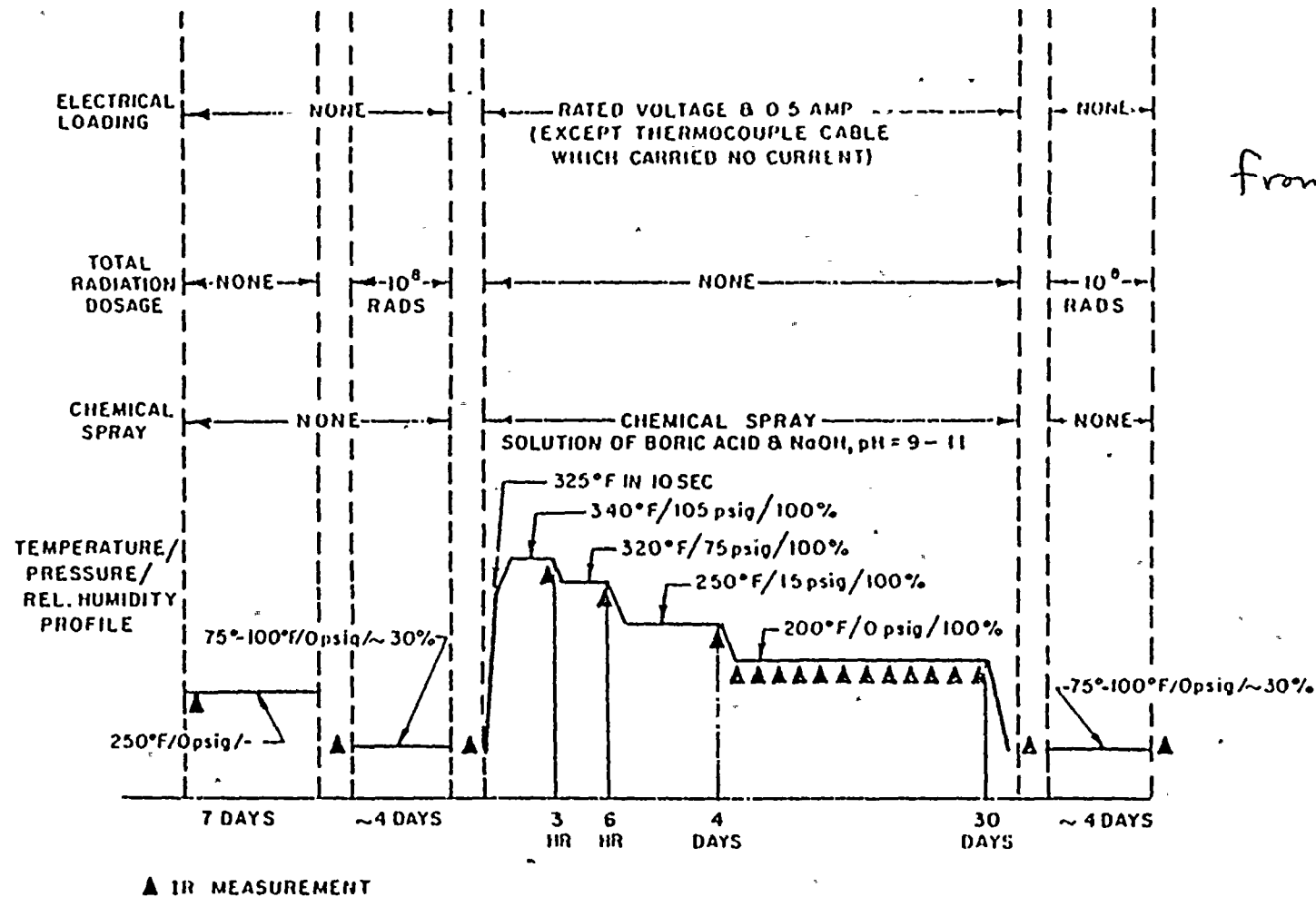


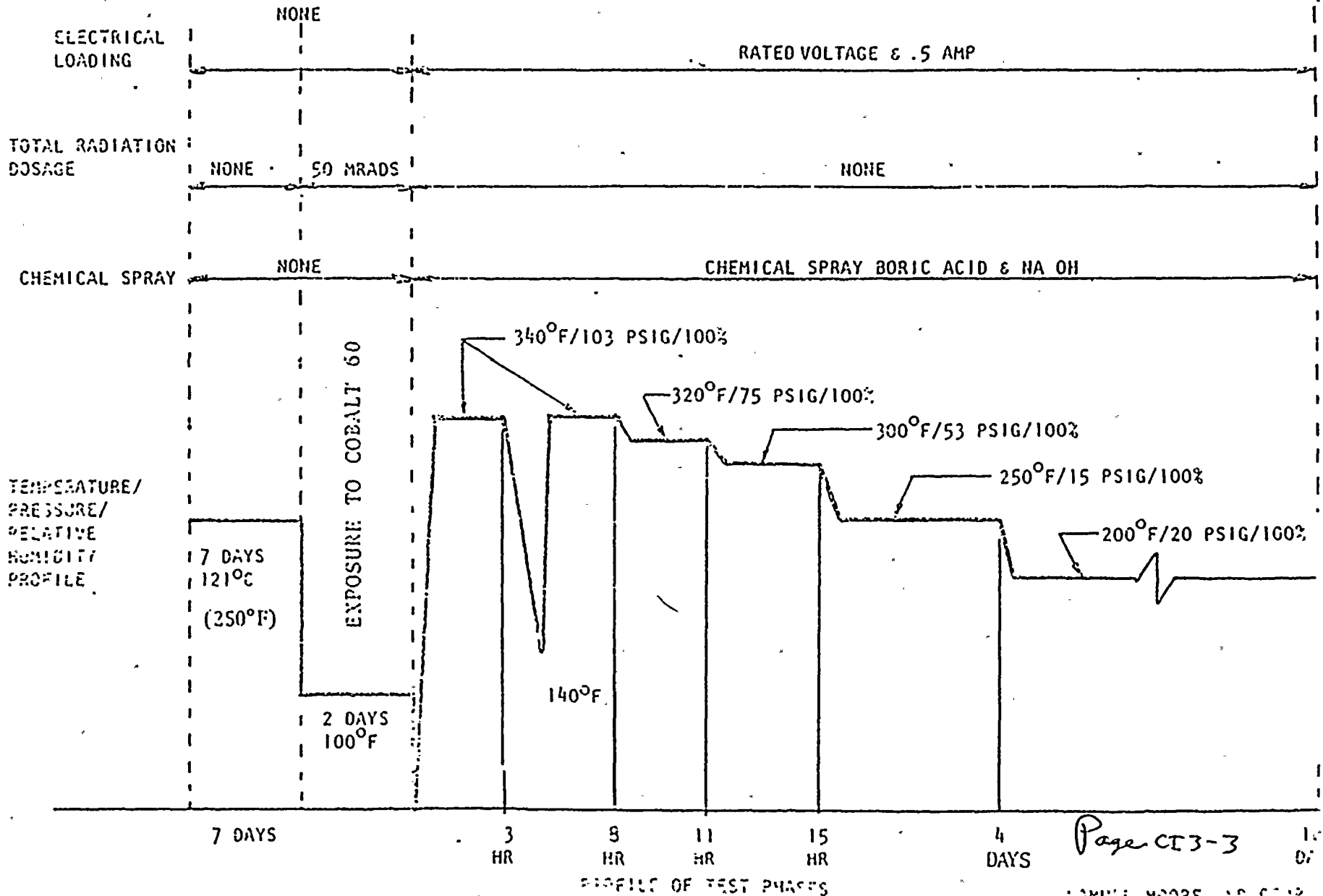
Figure 2. Profile of Test Phases

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F-C3683

THERMAL AGING AND
RADIATION EXPOSURE

LOSS-OF-COOLANT ACCIDENT SIMULATION



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>4 mo.</i>	<i>> 4 mo.</i>	<i>FSAR Table 7.5-2</i>	<i>63 33</i>	<i>Combination</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 0.27</i>	<i>340</i>	<i>FSAR APP 0</i>	<i>33</i>	<i>Seq.</i>	<i>None</i>
COMPONENT: <i>INSTRUMENT CABLE</i>	Pressure (PSIA)	<i>Fig 0.27</i>	<i>114.7</i>	<i>FSAR APP 0</i>	<i>33</i>	<i>Seq.</i>	<i>None</i>
MANUFACTURER: <i>Continental</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>	<i>NA</i>	<i>33</i>	<i>Seq.</i>	<i>None</i>
MODEL NUMBER: <i>Item # 3075</i>	Chemical Spray	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>4.1</i>	<i>10</i>	<i>See Note 1</i>	<i>33</i>	<i>Seq.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>							
LOCATION: <i>Out of Containment</i>							
FLOOD LEVEL ELEV: <i>NA</i> ABOVE FLOOD LEVEL: <i>NA</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>

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 10. 50-315
 (Page)
 4-12-84
 55-5 (174)
 75-1 (101)
 95-1 (130)
 170-1 (113)
 170, 15, 39
 220-225
 113

*Documentation References:

Notes:

33. FIRT TEST REPORT F-CR935, EXCERPT FROM
 63 Required Time Qual Analysis

1) DEPSC NSVC Calculation DC-N-6470-2 (Ref. 59)
 Page CI4-1



from
Ref.

33. FIRM TEST REPORT F-C 2935, EXCERPT FROM

Type of test: Sequential

gamma Radiation

Steam/

.45 MRAD/hr ; 10 MRAD

340°F, 100 psig, 2 hrs

160°F, , 20 hrs

Item # 3075, 3077 CONTINENTAL WIRE + CABLE Co.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	4mo.	>4.4mo.	FSAR Table 15-2	63 8	Combination	None
PLANT ID NO: VARIOUS	Temperature (°F)	FIG 0229-1,-2	345	FSAR APP Q	8	SEQ.	None
COMPONENT: INSTRUMENT CABLE	Pressure (PSIA)	FIG. 2 FIG 1	121.7	ASW 6504	8	SEQ.	None
MANUFACTURER: BOSTON INSULATED WIRE CO.	Relative Humidity (%)	100	100		8	SEQ.	None
MODEL NUMBER: ITEM # 3045	Chemical Spray	2000 ppm B 1/4 wt % Boric Acid 149-11	1500 ppm B 1/4 wt % Boric Acid 149-10	T.S. 314.5 314.5.6	8	SEQ.	None
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	9.5	150	WCAP 7410-1 VOL 1	8	SEQ.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	submerged	* FLOODUP Tubes		61	Combination	None
LOCATION: IN + OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: NO							

*Documentation References:

8. CONAX CORP. TEST REPORT IPS-348

61. FLOODUP Tube Qual. Packet

63. Required Time Qual. Analysis

Notes:

* FOR ALL CABLES EXCEPT ON NTP-140, MFC-110, 111, 112, 121, 132, 141, 140, 141. See Cable Note 1.



from Ref. 8

TEMPERATURE PROFILE
AEPSC TEST AT CONAX CORP.
BEGINNING, MARCH 31, 1978

Sheet 1 of 3

CHAMBER TEMPERATURE, °F

BEGINNING OF SPRAY

5

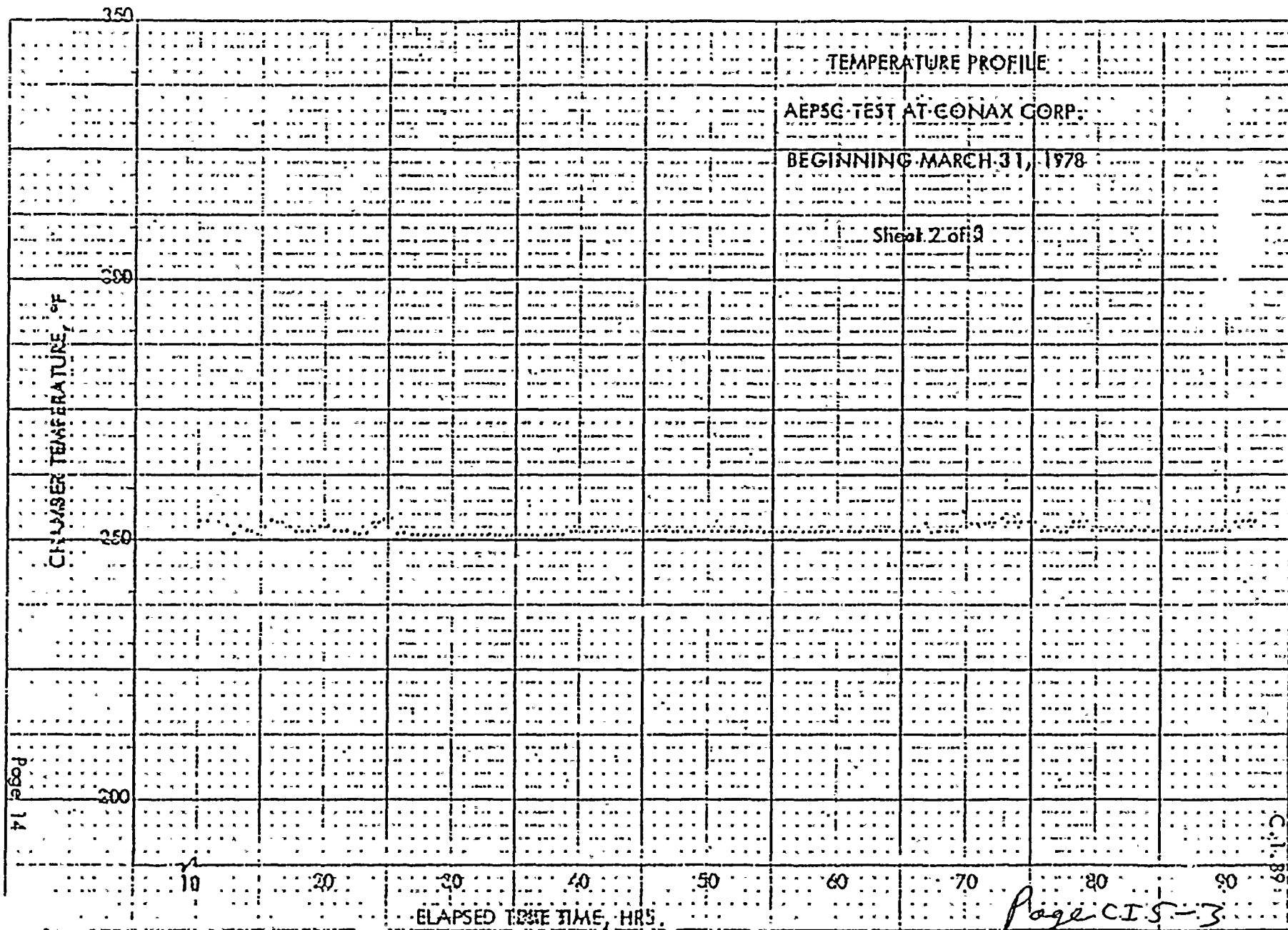
ELAPSED TIME, HRS.

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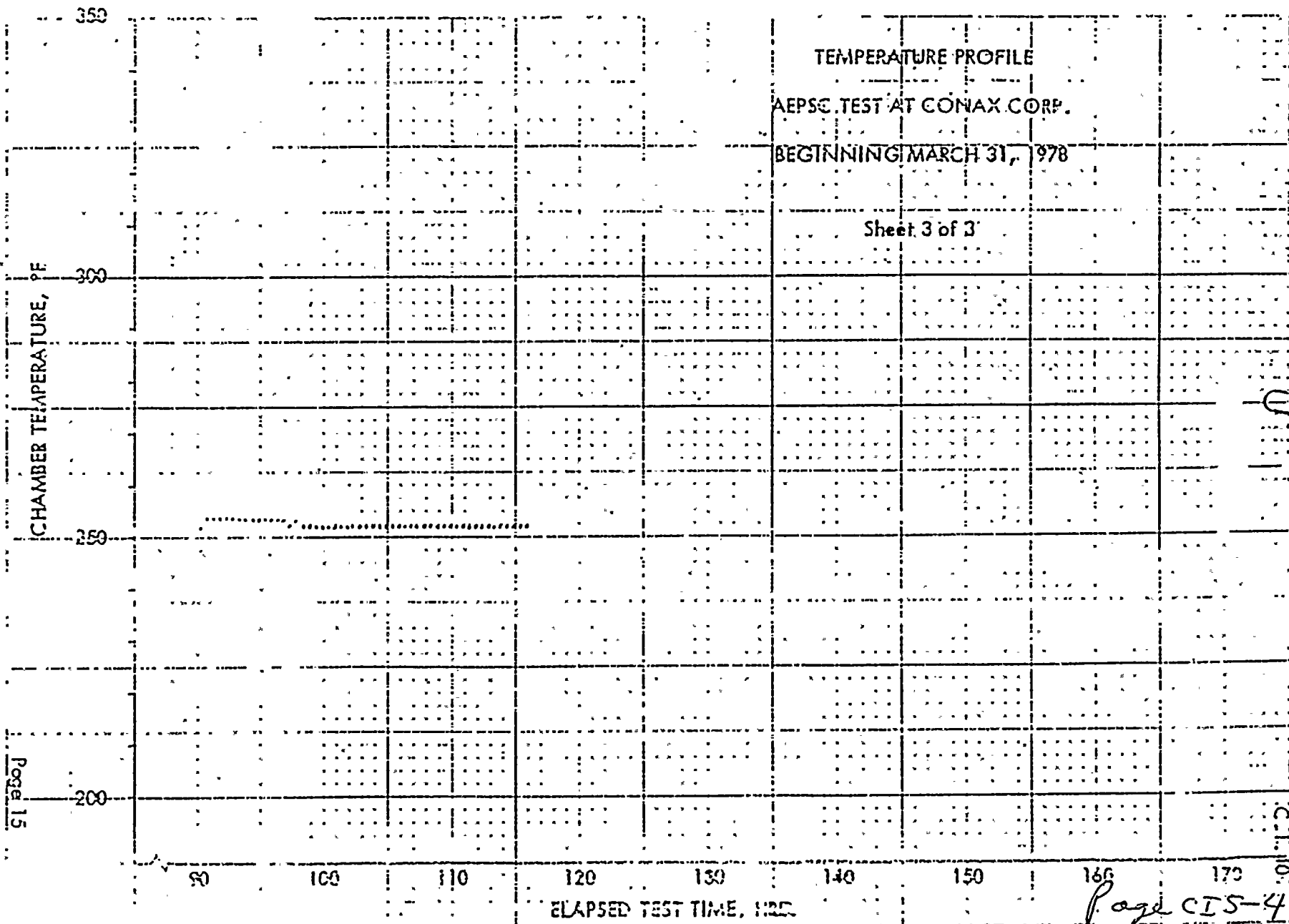
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C.I. 138

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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	4mo.	>4.4mo.	Table 2.5-2 FSAR	63 12	Combination	None
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 022.9-1-2	346	FSAR APP Q	12	SEP.	None
COMPONENT: INSTRUMENT CABLE	Pressure (PSIA)	Fig 1 FIG 2	127.7	APP 6504	12	SEP.	None
MANUFACTURER: CERRO WIRE & CABLE CO.	Relative Humidity (%)	100	100		12	SEP.	None
MODEL NUMBER: ITEM # 3077	Chemical Spray	1000ppmB 1.14wt % Boric Acid PH 9-11	3000ppmB 1.72wt % Boric Acid PH 9-11	T.S. 314.5 314.5.6	12	SEP.	None
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	95	100	WLAP 2410-L VOL1	12	SEP.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	Submerged	* Flooded Tubes		61	COMBINATION	None
LOCATION: IN & OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: '612'							
ABOVE FLOOD LEVEL: NO							

*Documentation References:

Notes:

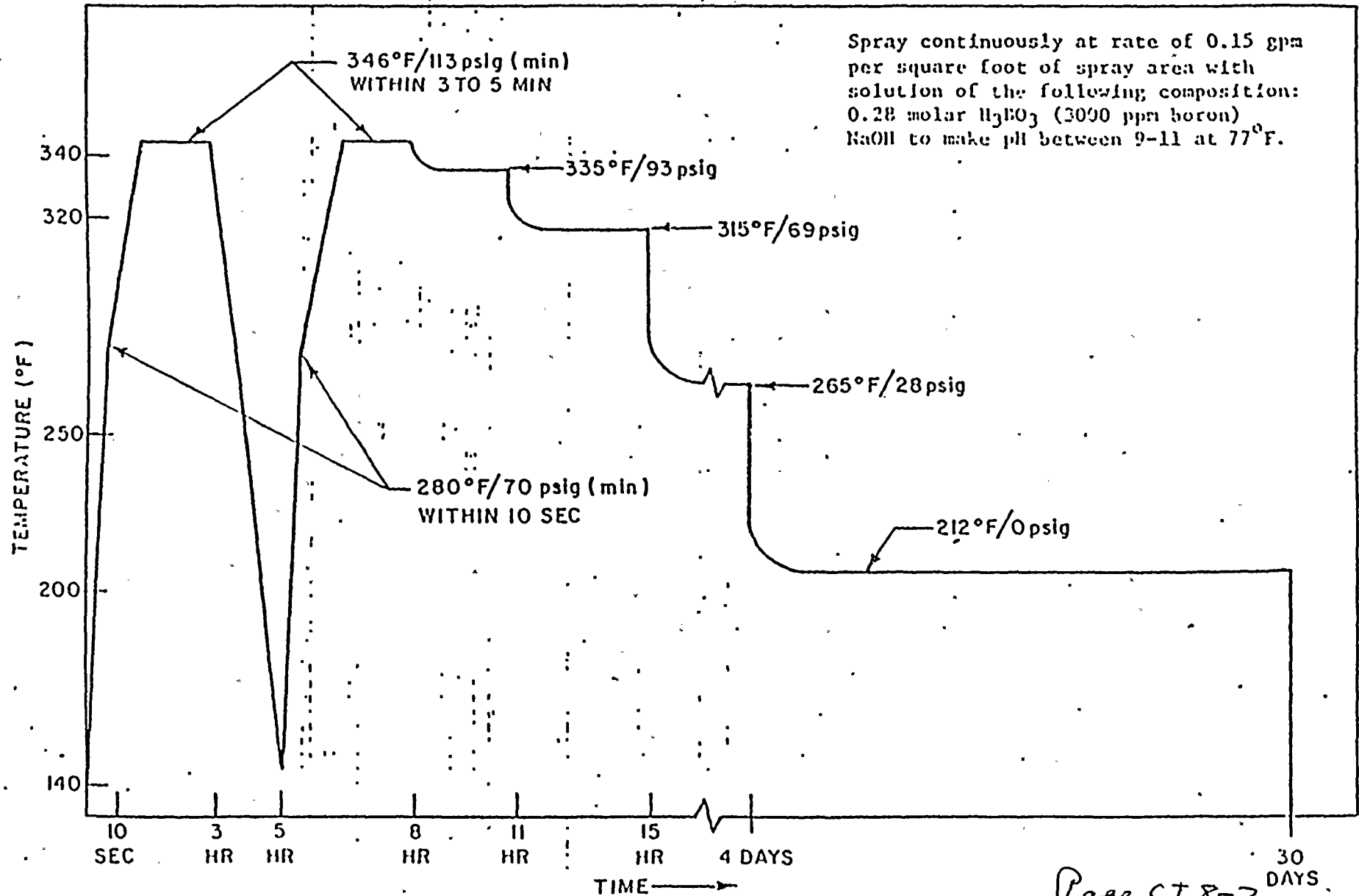
12. CERRO WIRE AND CABLE TEST REPORT OF MAY, 1976

61. Flooded Tube Qual. Packet

63. Required Time Qual Analysis

* EXCEPT FOR CABLES ON NTP-110, 111, 120, 121, 130, 131, 141, 210, 211, 220, 221, 230, 231, 240, 241. See Cable Mile 1c.

LOCA Profile



LOCA PROFILE

7.

25 23 S3
73 12 IS
12 1 13 1
125, 26, 27
125, 26, 27
128

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	4mo.	>4.4mo.	Table 7.5-2 FSAR	63 10	Combination	None
PLANT ID NO: VARIOUS	Temperature (°F)	Fig. 022.9-1, 2	340	FSAR APP Q	10	SEP.	None
COMPONENT: INSTRUMENT CABLE	Pressure (PSIA)	Fig. 2 Fig 1	119.7	ASFO 6504	10	SEP.	None
MANUFACTURER: SAMUEL MOORE & CO.	Relative Humidity (%)	100	100		10	SEP.	None
MODEL NUMBER: ITEM # 3077	Chemical Spray	2000 ppm B 1.14 wt % Boric PH 9-11 Acid	3000 ppm B 1.72 wt % Boric PH 9-11 Acid	T.S. 3145 3145.6	11	SEP.	None
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	9.5	200	WCAP 7410-L VOL I	10	SEP.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	Submerged	* FLOODUP Tubes		61	Combination	None
LOCATION: IN & OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: NO							

*Documentation References:

10. FZRL TEST REPORT F-C3683
11. ISOMEDIX CORP. TEST REPORT OF MAY, 1976
61. Floodup Tube Qual. Packet
63. Required Time Qual. Analysis

Notes:

* EXCEPT for Cables on NTP-110, 111, 120, 121, 130, 131, 210, 211, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

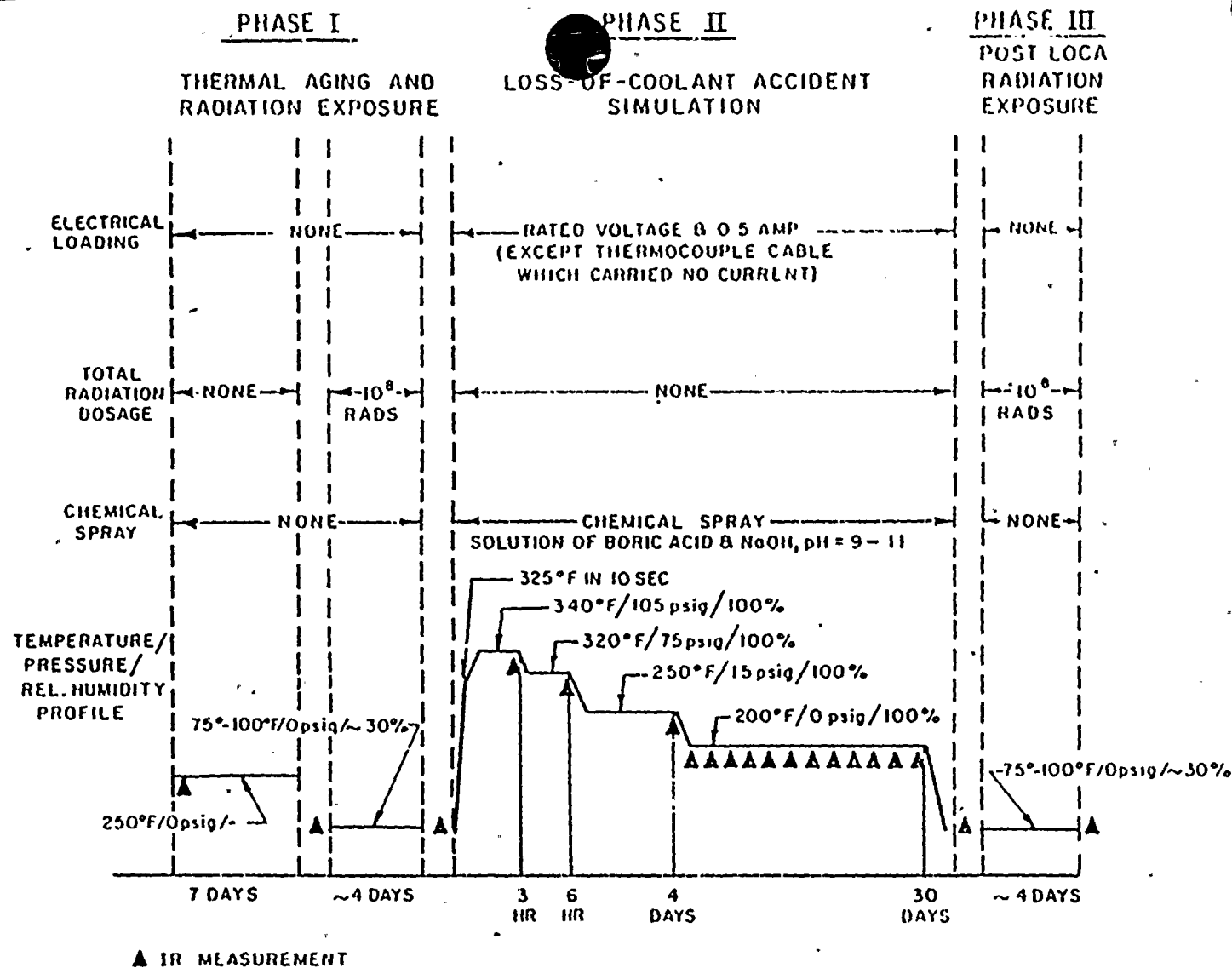


Figure 2. Profile of Test Phases

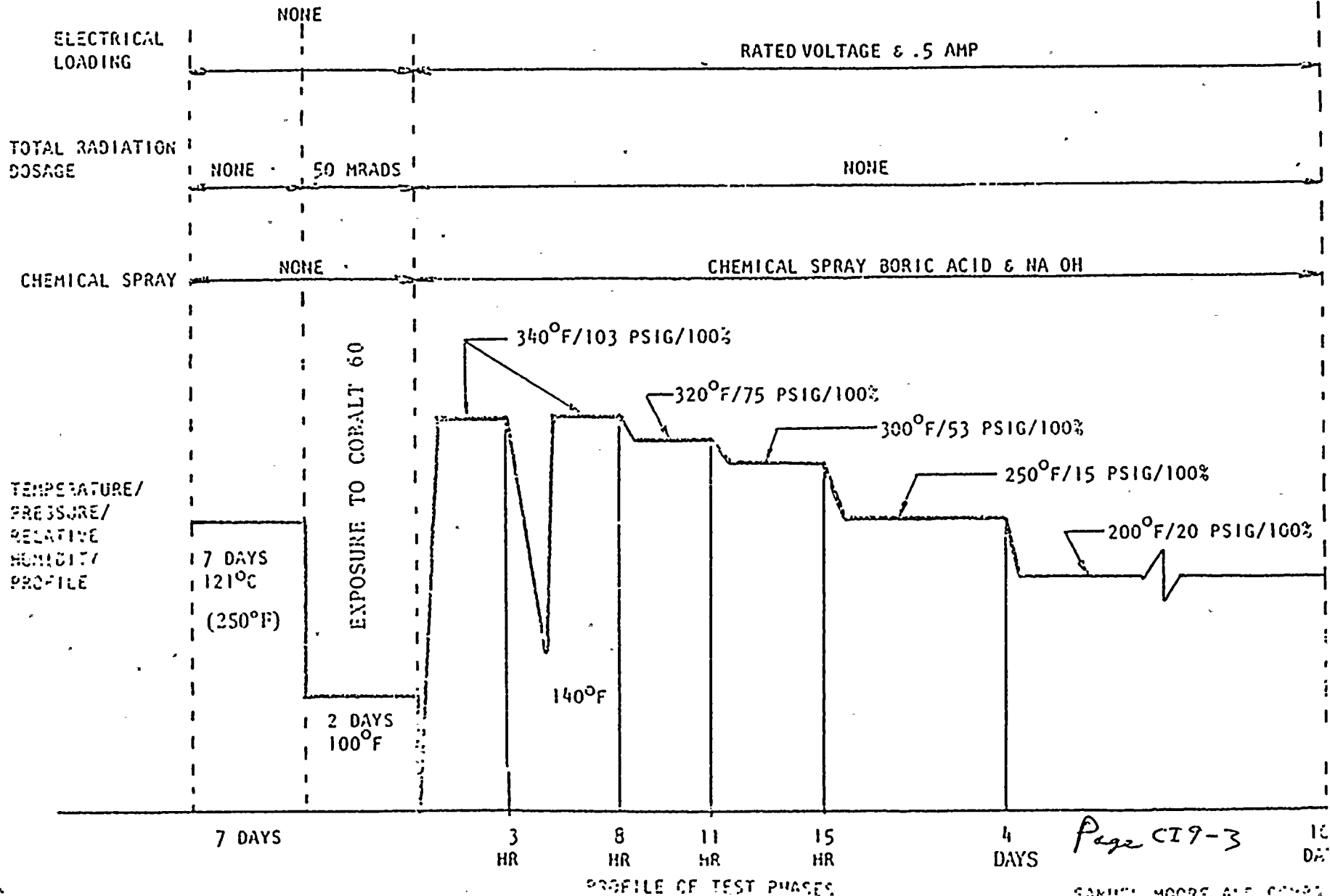
Page CI 9-2

F-C3683



THERMAL AGING AND
RADIATION EXPOSURE

LOSS-OF-COOLANT ACCIDENT SIMULATION



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>4 mo.</i>	<i>> 1/4 mo.</i>	<i>Table 7.5-2 FSAR</i>	<i>63 33</i>	<i>Combination</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 0-27</i>	<i>340</i>	<i>FSAR APP 0</i>	<i>33</i>	<i>Seq</i>	<i>None</i>
COMPONENT: <i>INSTRUMENT CABLE</i>	Pressure (PSIA)	<i>Fig 0-27</i>	<i>114.7</i>	<i>FSAR APP 0</i>	<i>33</i>	<i>Seq.</i>	<i>None.</i>
MANUFACTURER: <i>CONTINENTAL</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>	<i>NA</i>	<i>33</i>	<i>Seq.</i>	<i>None</i>
MODEL NUMBER: <i>Item #3077</i>	Chemical Spray	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>4.1</i>	<i>10</i>	<i>See Note 1</i>	<i>33</i>	<i>Seq.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA.</i>
LOCATION: <i>OUT CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>NA</i>							
ABOVE FLOOD LEVEL: <i>NA</i>							

*Documentation References:

Notes:

33. FIRM TEST REPORT F-C 2935
 63. Reg. Time Qual. Analysis

1) AEPSC NS+L calculation DC-N-6420-2 (Ref 59)



from
Ref.

33. FIRL TEST REPORT F-C 2935, EXCERPT FROM

Type of test: Sequential

gamma Radiation

Steam/

.45 MRAD/hr ; 10 MRAD

340°F, 100 psig, 2 hrs

160°F, , 20 hrs

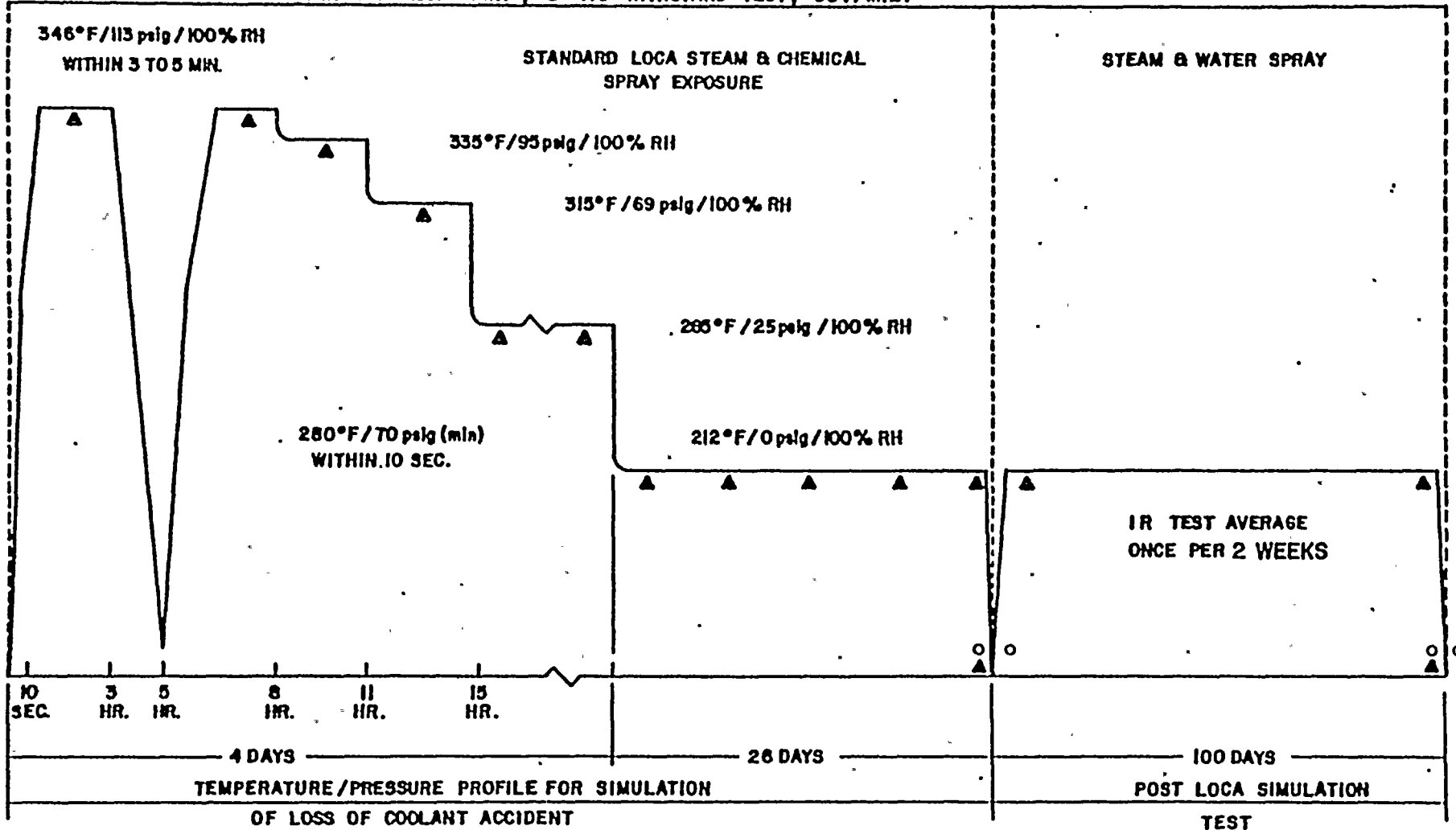
Item # 3075, 3077 . CONTINENTAL WIRE + CABLE Co.

Page CI 10-2



FIGURE II CABLE QUALIFICATION TEST PROFILE FOR LIFE & LOCA CONDITIONS

LEGEND: ▲ INSULATION RESISTANCE MEASUREMENT ; ○ AC WITHSTAND TEST, 80V/MIL.





EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>RHR</i>	Operating Time	<i>1 DAY</i>	<i>130 days</i>	<i>Table 2.5.2</i>	<i>49</i>	<i>Sequential</i> <i>See note</i>	<i>None</i>
PLANT ID NO: <i>IMD-325</i> <i>IMD-326</i>	Temperature (°F)	<i>Fig 13.13-1</i>	<i>346</i>	<i>FSAR APP N</i>	<i>49</i>	<i>Sequential</i>	<i>None</i>
COMPONENT: <i>Power CABLE</i>	Pressure (PSIA)	<i>Fig 1 Fig 2</i>	<i>127.7</i>	<i>AEW 6504</i>	<i>49</i>	<i>Sequential</i>	<i>None</i>
MANUFACTURER: <i>Okonite</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>49</i>	<i>Sequential</i>	<i>None</i>
MODEL NUMBER: <i>Item # 324</i>	Chemical Spray	<i>2000 ppmB 1.14wt% Boeje PH 9-11 Acid</i>	<i>3000 ppmB 1.72wt% Boeje PH 10.5 Acid</i>	<i>T.S. 3/4.5 3/4.6.5</i>	<i>49</i>	<i>Sequential</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>28 150</i>	<i>200</i>	<i>WCAP 7410-L VOL I</i>	<i>49</i>	<i>Sequential</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>submerged</i>	<i>Flood up Tubes</i>		<i>61</i>	<i>Combination</i>	<i>None</i>
LOCATION: <i>In Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>No</i>							

*Documentation References:

49. The Okonite Company
Form N-1, Revised 7/3/78
61. Floodup Tube Qual. Packet

Notes: cable tested: 1/c #12 (7X) coated Cu
1030 okonite insulation

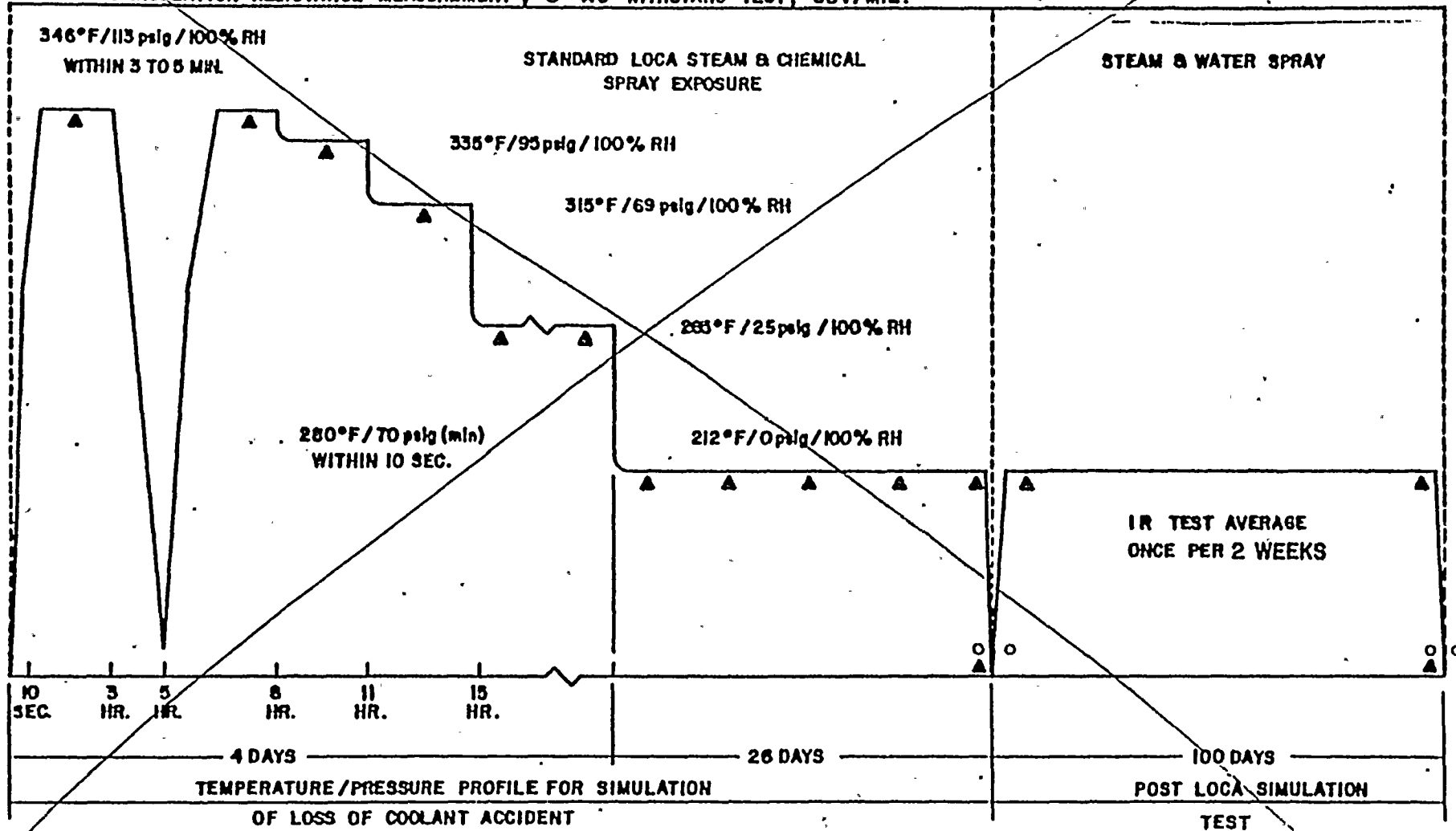
cable installed at DCCook plant:
1/c #12 (7X) coated Cu
- 1030 okonite insulation
1015 okoprene jacket

THIS PAGE NO LONGER VALID
SEE CP-7, CP-8, CP-9



FIGURE II CABLE QUALIFICATION TEST PROFILE FOR LIFE & LOCA CONDITIONS

LEGEND: ▲ INSULATION RESISTANCE MEASUREMENT ; ○ AC WITHSTAND TEST, 80V/MIL.



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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	> 1 DAY				None
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 0-27	> 250	FSAR APP. 0	65	Eng'g Review	None
COMPONENT: Power Cable	Pressure (PSIA)	Fig 0-27	> 26	FSAR APP. 0	65	Eng'g Review	None
MANUFACTURER: Essex	Relative Humidity (%)	NA	NA	NA	NA	NA	NA
MODEL NUMBER: Item # 324	Chemical Spray	NA	NA	NA	NA	NA	NA
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	4.1	10	59	See Note 1	Engineering Review See Note 1 below	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: Outside Containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA							

*Documentation References:

Notes:

Note 1) As per table C-1 App.C to NRC IE Bulletin 79013,
cable insulation material (EPR-Dioprene) is good for 10 MEADS.

Ref 59) AEPSC NS&L DC-N 4320-2

65) E.Q. for outside containment cable

Page CP 3-1

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>3 mo.</i>	<i>13/DAYS</i>	<i>Table 7.5-2 FSAR</i>	<i>6</i>	<i>Simul.</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>FIG 022.9-1, -2</i>	<i>346</i>	<i>FSAR APP Q</i>	<i>6</i>	<i>SIMUL.</i>	<i>None</i>
COMPONENT: <i>POWER CABLE</i>	Pressure (PSIA)	<i>FIG 1 FIG 2</i>	<i>127.7</i>	<i>APPD 6504</i>	<i>6</i>	<i>SIMUL.</i>	<i>None</i>
MANUFACTURER: <i>OKONITE</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>6</i>	<i>SIMUL.</i>	<i>None</i>
MODEL NUMBER: <i>ITEM # 399</i>	Chemical Spray	<i>2000 ppm B 1.14 wt % Boric Acid PH 9-11</i>	<i>2000 ppm B 1.14 wt % Boric Acid PH 9-11</i>	<i>T.S. 314.5 314.5.6</i>	<i>6</i>	<i>SIMUL.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>85</i>	<i>200</i>	<i>WCAP 7410-L VOL I</i>	<i>6</i>	<i>SIMUL.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>submerged</i>	<i>FLOODUP Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>None</i>
LOCATION: <i>IN + OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>612'</i>							
ABOVE FLOOD LEVEL: <i>NO</i>							

*Documentation References:

Notes:

6. FIRE TEST REPORT F-C3694

61. Floodup Tube Qual. Packet

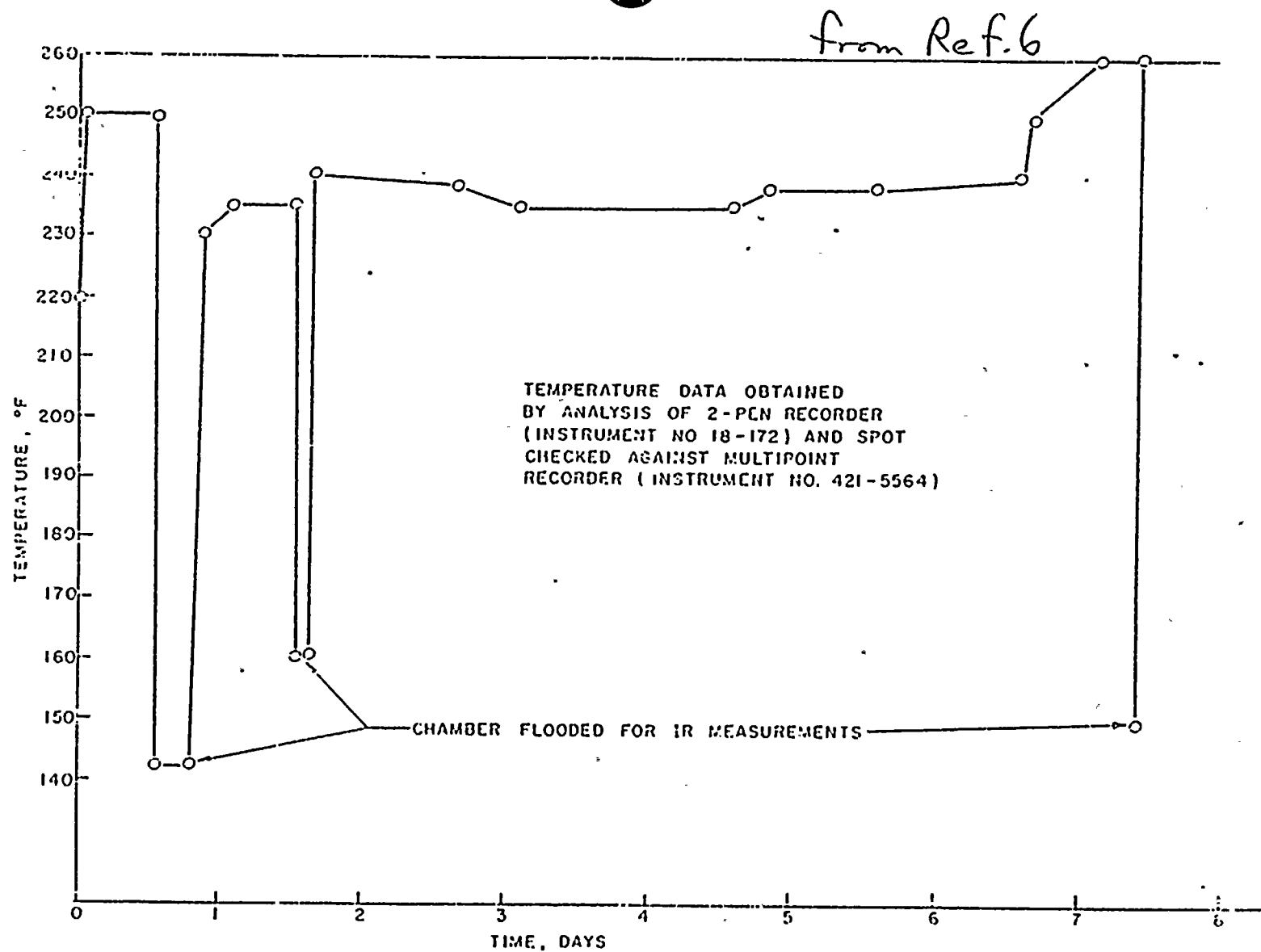


Figure 6. Actual Temperature Profile for Simultaneous Thermal Aging with Radiation . Page CP4-2

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 yr.					None
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 0-27	See Note 2	FSAR App. 0	Note 2	Eng'g Review	None
COMPONENT: Power Cable	Pressure (PSIA)	Fig 0-27	See Note 2	FSAR App. 0	Note 2	Eng'g Review	None
MANUFACTURER: ANACONDA	Relative Humidity (%)	NA	NA	NA	NA	NA	NA
MODEL NUMBER: Item #3102	Chemical Spray	NA	NA	NA	NA	NA	NA
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	3.6	10	See Note A	See Note (1)	Engineering Review See Note.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS							
LOCATION: Outside Containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Submergence	NA	NA	NA	NA	NA	NA

72 M1
93-94 M1

*Documentation References:

of Enclosure 4,

Notes:

Note 1) As per Table C-1 App. A to NRC IE Bulletin 7901B,
Cable insulation material (EPR-Hypalon) is good for 10 MRADS)

A) AEPSC NS&L Calculator DC-10-W420-21 (7/1-59)
with accounting for distance from source



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 yr.	> 1.1 yr.		63 37	Combination	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 0-27	346	FSAR APP 0	37	SEQ.	NONE
COMPONENT: Instrument CABLE	Pressure (PSIA)	Fig 0-27	127.7	FSAR APP 0	37	SEQ.	NONE
MANUFACTURER: OKONITE	Relative Humidity (%)	NA	100	NA	37	SEQ.	NONE
MODEL NUMBER: Item # 3102	Chemical Spray	NA	3000 ppm B 1,1,2,2-tetrafluoroethane PH 10.5 Acid	NA	37	SEQ.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	16.6	200	See Note 1	37	SEQ.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: out of containment							
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: NA							

*Documentation References:

Notes:

37. OKONITE. Qual of OKOGUARD Ethylene-Propylene
Rubber Insulation for Nuclear Plant Service

63. Req'd Time Qual. Analysis

1) AEPSC NS&L calculation (Ref 59)
DC-N-6420-2

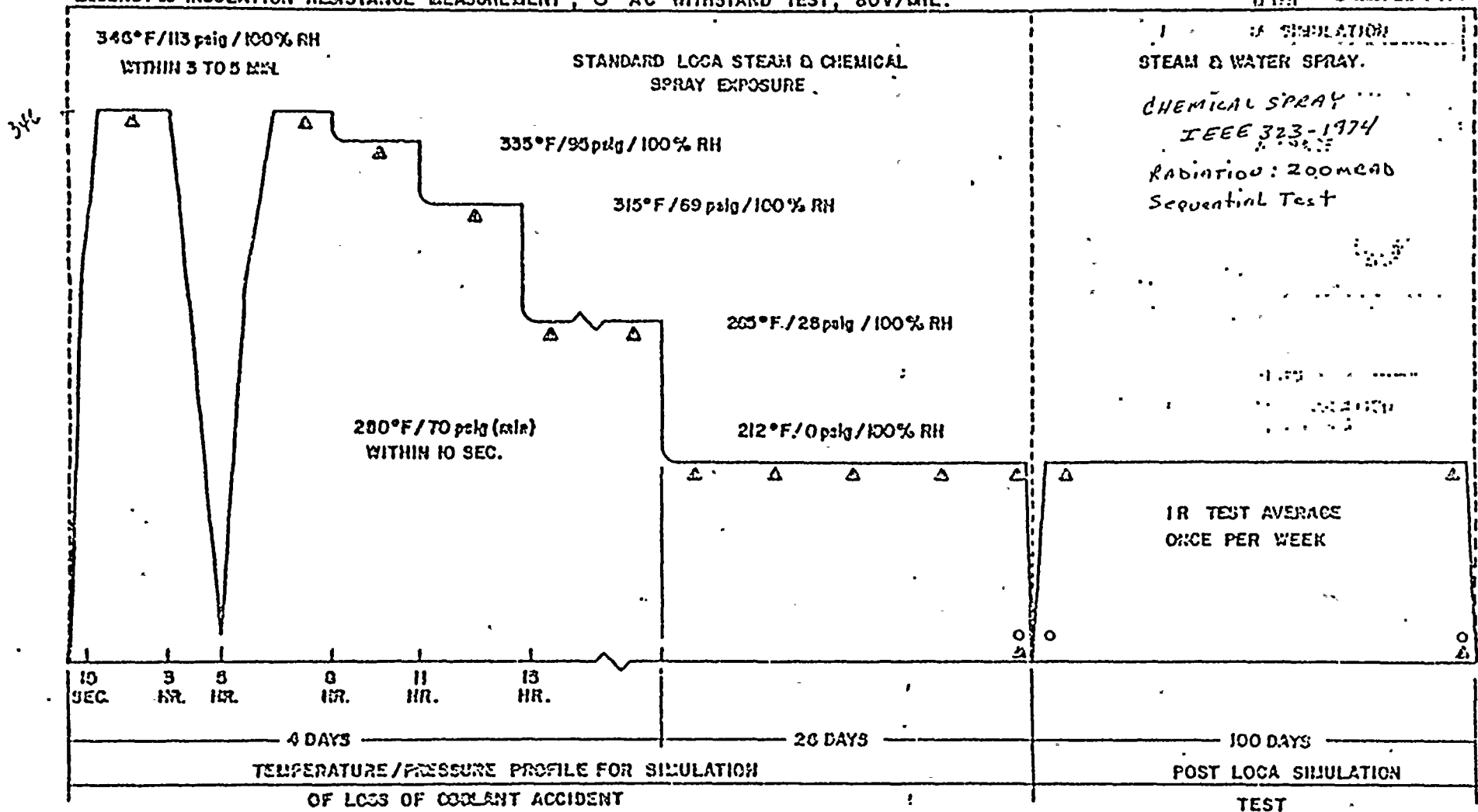


OKONITE Co. QUAL. of OKOGUARD Ethylene Propylene Rubber Insulation for
NUCLEAR PLANT SERVICE

FIGURE II CABLE QUALIFICATION TEST PROFILE FOR LIFE &
LOCA CONDITIONS

from Ref. 37

LEGEND: Δ INSULATION RESISTANCE MEASUREMENT; ○ AC WITHSTAND TEST, 80V/MIL.



Page CP6-2

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	61 DAYS	FSAR Table 7.5.2	5	Simul	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 022.9-1,2	340	FSAR App Q	5	SIMUL.	NONE
COMPONENT: POWER CABLE	Pressure (PSIA)	FIG. 2 Fig 1	119.7	Acid 604	5	SIMUL.	NONE
MANUFACTURER: ANACONDA WIRE & CABLE	Relative Humidity (%)	100	100		5	SIMUL.	NONE
MODEL NUMBER: ITEM # 3114	Chemical Spray	2000 ppm B 1.14 wt % Boric PH 9-11 Acid	3000 ppm B 1.22 wt % Boric PH 9.5 Acid	FS. 314.5 314.5.6	5	SIMUL.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	28	200	WCAP 7410-L Vol 1	5	SIMUL.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS							
LOCATION: IN & OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: 612' ABOVE FLOOD LEVEL: NO	Submergence	submerged	FLOODUP Tubes		61	COMBINATION	NONE

*Documentation References:

5. FIRC TEST REPORT F-C3341

61. FLOODUP TUBE Qual. Packet

Notes:

from Ref. 5. Qualified by Franklin Institute Research Laboratory
(FIRL) Test Report #F-C3341, Jan. 1973.

Type of Test: Simultaneous, gamma radiation
steam
chemical spray

Test Profile:

.51 Mrads/hr, 200 Mrads
340°F, 105 psig for 3 hrs
320°F, 75 psig for 3 hrs
250°F, 15 psig for 4 days
210°F, 5 psig for 9 days

Chemical Spray: Solution of boric acid
and Na OH, PH = 9.5

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	30 DAYS	FSAR Table 7.5-2	25	Simul.	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 022.9-1, -2	346	FSAR App 9	25	Simul	NONE
COMPONENT: Power Cable	Pressure (PSIA)	Fig 1 FIG 2	127.7	Aew 6504	25	Simul.	NONE
MANUFACTURER: Essex International	Relative Humidity (%)	100	100		25	Simul.	NONE
MODEL NUMBER: Item #3116	Chemical Spray	200.0ppmB 1.14wt% Boric Acid pH 9-11	3000ppmB 1.72wt% Boric Acid pH 9.5-10.5	T.S. 2/4.5 3/4.5.6	25	Simul.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	28	200	WCAP 7410-L Vol 1	25	Simul.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	Submerged	FLOODUP Tubes		61	Combination	NONE
LOCATION: IN AND Out of Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: NO							

*Documentation References:

Notes:

25. Isomedix Corp. Test Report of Nov, 1975
 61. Floodup Tube Qual. Packet



from Ref. 25. Qualified by Isomedix Corp. Test Report of November 1975

Type of Test: Simultaneous, gamma radiation
steam
chemical spray

Test Profile:

.2 - .3 Mrads/hr, 200 Mrads
346°F, 113 psig for 5 hrs
265°F, 28 psig for 4 days
215°F, 2 psig for 26 days

Chemical Spray: 3000 ppm boron as boric acid in solution with .06% molar sodium thiosulfate buffered with sodium hydroxide to a PH of 9 to 11.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	7.5 DAYS	FSAP Table 7.5-2	7	Seq	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 022.9-1,-2	325	FSAR APP 9	7	SEQ.	NONE
COMPONENT: POWER CABLE	Pressure (PSIA)	Fig 1 FIG 2	96.7	ABD 6804	7	SEQ.	NONE
MANUFACTURER: KERITE	Relative Humidity (%)	100	100		7	SEQ.	NONE
MODEL NUMBER: ITEM # 3110	Chemical Spray	2000 ppm B 1.14 wt % Boric Acid PH 9-11	2600 ppm B 1.5 wt % Boric Acid PH 9.5	T.S. 314.5 314.6	7	SEQ.	NONE
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	2.8	120	WCAP 7410-1 Vol. I.	7	Seq	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	submerged	FLOODUP TUBES		61	COMBINATION	NONE
LOCATION: IN + OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: 61.2'							
ABOVE FLOOD LEVEL: NO							

*Documentation References:

Notes:

7. KERITE CO. Report on the Effects of Gamma RAD. AND
Autoclaving on Kerite Power + Control CABLE.

61. FLOODUP Tube Qual, Packet



From Ref. 7. Qualified by Kerite Co. Report on the effects of Gamma Radiation
April 30, 1970. and Outslowing on Kerite Power Control Cables

Type of Test: Sequential, gamma radiation
steam
chemical spray

Test Profile:

.8 Mrads/hr, 120 Mrads
325°F, 82 psig for 13 hrs
228°F, 5 psig for 7 days

Chemical Spray: Borated water, 1-1/2% solution of
boric acid and distilled water
buffered at a PH of 9.5



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 year</i>	<i>> 1.1 yr</i>	<i>13.4.2 13.1.2 7.1.2</i>	<i>63 7</i>	<i>Combination</i>	<i>NONE</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>FIG 0-27</i>	<i>325</i>	<i>FSAL APP 0</i>	<i>7</i>	<i>SEQ.</i>	<i>NONE</i>
COMPONENT: <i>Power Cable</i>	Pressure (PSIA)	<i>FIG 0-27</i>	<i>96.7</i>	<i>FSAL APP 0</i>	<i>7</i>	<i>SEQ.</i>	<i>NONE</i>
MANUFACTURER: <i>KERITE</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>	<i>NA</i>	<i>7</i>	<i>SEQ.</i>	<i>NONE</i>
MODEL NUMBER: <i>Item # 3127</i>	Chemical Spray	<i>NA</i>	<i>2600 ppm B 1.5 wt % Boric pH 9.5 Acid</i>	<i>NA</i>	<i>7</i>	<i>SEQ.</i>	<i>NONE</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>17</i>	<i>200</i>	<i>see note 2</i>	<i>see note 1</i>		<i>NONE</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>submerged</i>	<i>Inside Floodup Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>NA</i>
LOCATION: <i>INSIDE Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>No</i>							

*Documentation References:

Notes:

7. Kerite Co. Report on the Effects of Gamma Rad.
and Autoclaving on Kerite Power & Control
CABLE.

61. Floodup Tube Qual. Packet
63. Req'd Time Qual. Analysis

Letter from Robert Henry (Kerite)
for L.F. (AEP) of 4-18-80

2. AEPSC. NSTL CALCULATION (Ref 59)
DC-N-6420-2.



7. Qualified by Kerite Co. Report on the effects of Gamma Radiation
April 30, 1970. *and Autoclaving on Kerite America Control Cable*

Type of Test: Sequential, gamma radiation
steam
chemical spray

Test Profile:

.8 Mrads/hr, 120 Mrads
325°F, 62 psig for 13 hrs
228°F, 5 psig for 7 days

Chemical Spray: Borated water, 1-1/2% solution of
boric acid and distilled water
buffered at a PH of 9.5

Page CP11-2

RWC 9/2/80

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	3 mo.	>33mo.	FSAR TUBE 7.5-2	63/35	Combination	NONE
PLANT ID NO: VARIOUS	Temperature (°F)	FIG. 13.13-1	303	FSAR APP 11	35	SEQ	NONE
COMPONENT: POWER CABLE	Pressure (PSIA)	FIG. 1 FIG. 2	-80.7	AEW-6504	35	SEQ	NONE
MANUFACTURER: CYPRUS	Relative Humidity (%)	100.	100.	ENG Analys	35	SEQ	NONE
MODEL NUMBER: Item #347	Chemical Spray	2000 ppmB 1/4wt% Boric pH 9-11 Acid	2000 ppmB 1/4wt% Boric pH 9 Acid	T.S. 3/4.5 3/2.56	35	SEQ	NONE
FUNCTION: VARIOUS	Radiation (10 ⁵ rads)	85	300.	WCAP 7410-1 Vol. 1	35	SEQ	NONE
ACCURACY: SPEC: NA DEMO: NA	Aging (years)			PLATE LIFE			
SERVICE: VARIOUS	Submergence	SUBMERGED	FLOODUP TUBES		61	Combination	NONE
LOCATION: IN AND OUT OF CONTAINMENT							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: NO							

*Documentation References:

35. FIRE TEST REPORT F.C. 3016

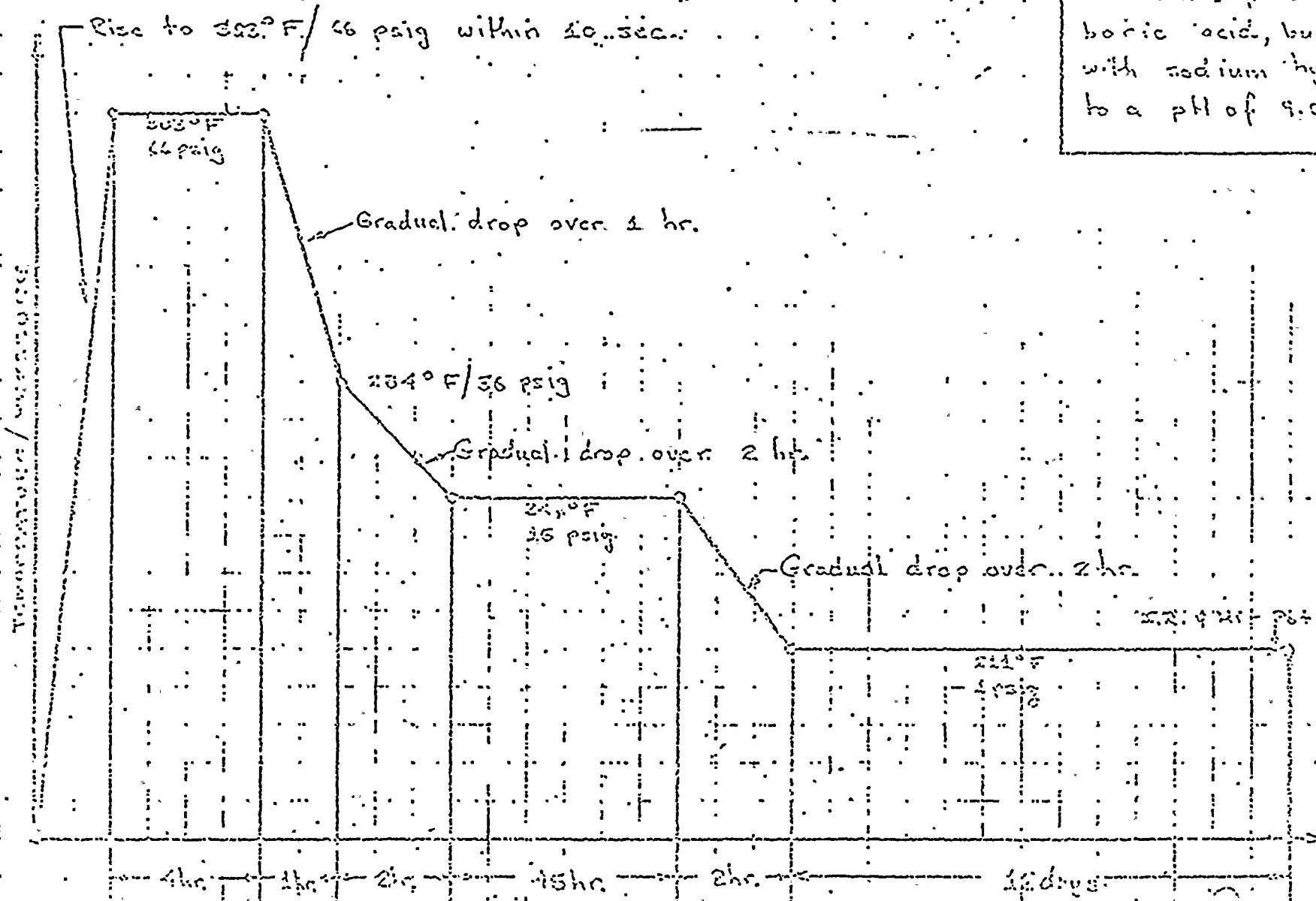
61. FLOODUP TUBE Qual. Packet

63. Read Time Qual. Analysis

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IRL TEST REPORT F-C 3016
Sequencing Test
RADIATION: 300 MRAD

Chemical spray maintained
during entire test: 2000 ppm
solution of boric acid
boric acid, buffered
with sodium hydroxide
to a pH of 9.0.



Page 12

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>3 mo.</i>	<i>>33mo.</i>	FERR TABLE F.S-2	<i>5</i> <i>63</i>	<i>Combination</i>	<i>NONE</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	Fig 022.9-12 <i>328.2</i> PEAK	<i>340</i>	FSAR APP Q	<i>5</i>	<i>SIMUL.</i>	<i>NONE</i>
COMPONENT: <i>POWER CABLE</i>	Pressure (PSIA)	Fig. 1 Fig. 2	<i>119.7</i>	AEW GSD4	<i>5</i>	<i>SIMUL.</i>	<i>NONE</i>
MANUFACTURER: <i>ANACONDA WIRE & CABLE CO.</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>	ENG. ANACONDA	<i>5</i>	<i>SIMUL.</i>	<i>NONE</i>
MODEL NUMBER: <i>ITEM #347</i>	Chemical Spray	<i>2000 ppm B</i> <i>1.14 wt % Boric</i> <i>ph 9-11 Acid</i>	<i>3000 ppm B</i> <i>1.72 wt % Boric</i> <i>ph 9.5 Acid</i>	TS. <i>3/4.5</i> <i>3/4.5.6</i>	<i>5</i>	<i>SIMUL.</i>	<i>NONE</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>85</i>	<i>200</i>	WCSF 7410-2 Vol 1	<i>5</i>	<i>SIMUL.</i>	<i>NONE</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)			22140 USE			
SERVICE: <i>VARIOUS</i>	Submergence	<i>SUBMERGED</i>	<i>FLOODUP TUBES</i>	ONS. ANALYSIS	<i>61</i>	<i>Combination</i>	<i>NONE</i>
LOCATION: <i>IN & OUT OF CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

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*Documentation References:

Notes:

5. FERR TEST REPORT F.C 3341
61. Floodup Tube Qual. Packet
63. Req'd Time Qual. Analysis



From Ref. 5. Qualified by Franklin Institute Research Laboratory
(FIRL) Test Report #F-C3341, Jan. 1973.

Type of Test: Simultaneous, gamma radiation
steam
chemical spray

Test Profile:

.51 Mrads/hr, 200 Mrads
340°F, 105 psig for 3 hrs
320°F, 75 psig for 3 hrs
250°F, 15 psig for 4 days
210°F, 5 psig for 9 days

Chemical Spray: Solution of boric acid
and Na OH, PH = 9.5

EQUIPMENT DESCRIPTION	ENVIRONMENT > 10 yrs			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>NA</i>	Operating Time	<i>1 YEAR</i>	<i>> 1 yr</i>	TABLE 7.5-2 FSAR	<i>60</i>	<i>Combination</i>	<i>NONE</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 022.9-1, 2</i>	<i>346</i>	FSAR APP Q	<i>3</i>	<i>Seq.</i>	<i>NONE</i>
COMPONENT: <i>4KV ELECTRICAL PENETRATIONS</i>	Pressure (PSIA)	<i>FIG. 2 Fig 1</i>	<i>122</i>	AEW 6104	<i>3</i>	<i>Seq.</i>	<i>NONE</i>
MANUFACTURER: <i>CONAX CORP.</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>3</i>	<i>Seq.</i>	<i>NONE</i>
MODEL NUMBER: <i>EP-1</i>	Chemical Spray	<i>2000 ppmB, 1.14 wt % B₂O₃, PH 9-11 Acid</i>	<i>2000 ppmB, 1.14 wt % B₂O₃, PH 9.5 Acid</i>	T.S. 314.5 314.6	<i>3</i>	<i>Seq.</i>	<i>NONE</i>
FUNCTION: <i>Containment Isolation</i>	Radiation (10 ⁶ rads)	<i>60</i>	<i>100</i>	Letter W-7AEP AEW-719	<i>3</i>	<i>Seq.</i>	<i>NONE</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)	<i>40</i>	<i>> 40</i>		<i>60</i>	<i>Combination</i>	<i>NONE</i>
SERVICE: <i>ISOLATE Containment</i>	Submergence	<i>submerged</i>	<i>Yes</i>	ENG. ANAL.	<i>17, 18</i>	<i>Sequential</i>	<i>NONE</i>
LOCATION: <i>INSIDE Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i>							
ABOVE FLOOD LEVEL: <i>No</i>							

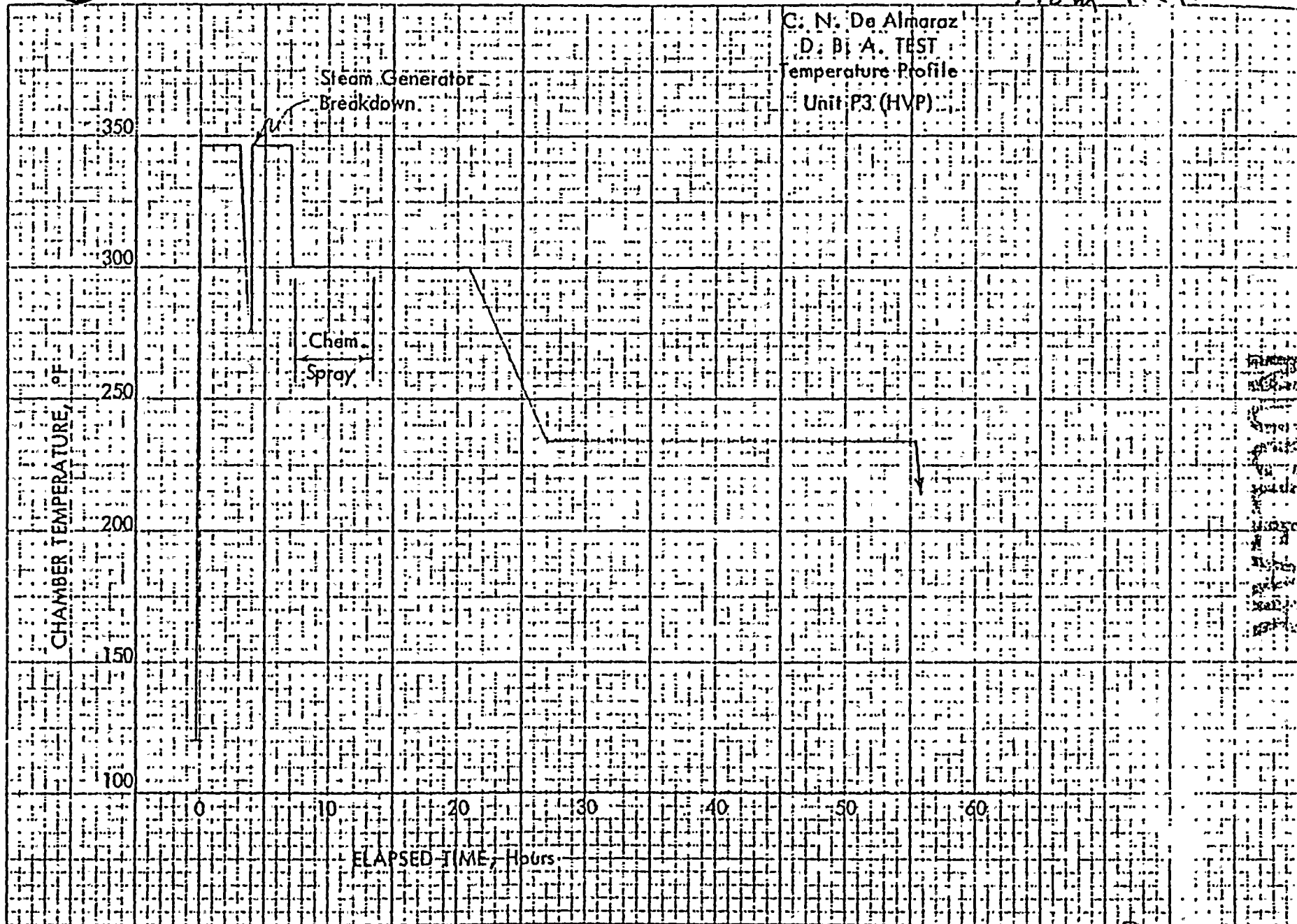
*Documentation References:

Notes:

3. Conax Corp. Test Report IPS-137
17. Conax Corp. Test Report IPS-326
18. Conax Corp. Test Report IPS-527
60. ELECTRICAL PENETRATION ANALYSIS



from Ref. 3



IPS-137

ALD C. COOK NUCLEAR PLANT UNIT NO. 1

SHEET NO. 50-315

LICENSE NO. D-1000

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>NA</i>	Operating Time	<i>1 year</i>	<i>> 1 yr</i>	TABLE 7.5-2 FSAR	<i>60</i>	<i>Combination</i>	<i>NONE</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 022.9-1, -2</i>	<i>340</i>	FSAR APP Q	<i>1</i>	<i>Seq</i>	<i>NONE</i>
COMPONENT: <i>600V AND Below ELECTRICAL PENETRATIONS</i>	Pressure (PSIA)	<i>Fig 2 Fig 1</i>	<i>116</i>	APP 6104	<i>1</i>	<i>Seq</i>	<i>NONE</i>
MANUFACTURER: <i>CONAX Corp.</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>1</i>	<i>Seq</i>	<i>NONE</i>
MODEL NUMBER: <i>EA2 through EP-14</i>	Chemical Spray	<i>2000 ppm 1.11 wt % Boric Acid PH 9-11</i>	<i>2000 ppm 1.22 wt % Boric Acid PH 9-5</i>	T.S. 314.5 314.5.6	<i>3</i>	<i>Seq</i>	<i>NONE</i>
FUNCTION: <i>Containment Isolation</i>	Radiation (10 ⁶ rads)	<i>60</i>	<i>100</i>	letter AEW-729	<i>1</i>	<i>Seq</i>	<i>NONE</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)	<i>40</i>	<i>> 40</i>		<i>60</i>	<i>Combination</i>	<i>NONE</i>
SERVICE: <i>Isolate Containment</i>	Submergence	<i>submerged</i>	<i>Yes</i>		<i>17/18</i>	<i>Sequential</i>	<i>NONE</i>
LOCATION: <i>INSIDE Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i>							
ABOVE FLOOD LEVEL: <i>NO</i>							

*Documentation References:

Notes:

1. CONAX Corp. Test Report IPS-234
2. CONAX Corp. Test Report IPS-137
17. CONAX Corp Test Report IPS-226
18. CONAX Corp Test Report IPS-327
60. ELECTRICAL PENETRATION STUDY



1. Qualified by Connex Corp. Test Report IPS-234

June 9, 1977

Type of Test: Sequential. Irradiation / steam

Test Profile

1.0 - 1.1 Mrads/hr for 100 hrs.

100 - 110 Mrads total dose

340°F, 116 psia for 3 hrs

Perform leakage test and repeat steam test

340°F, 116 psia for 3 hrs.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 YEAR</i>	<i>> 1.17E-1</i>	<i>Table 7.5-2</i>	<i>63 21</i>	<i>COMBINATION</i>	<i>NONE</i>
PLANT ID NO: <i>HY-CEQ-1</i> <i>HY-CEQ-2</i>	Temperature (°F)	<i>F16 13.13-1</i>	<i>320</i>	<i>FSAR APP N</i>	<i>21</i>	<i>Seq.</i>	<i>NONE</i>
COMPONENT: <i>FAN MOTORS</i>	Pressure (PSIA)	<i>F16.2 Fig 1</i>	<i>89.7</i>	<i>AEW 6504</i>	<i>21</i>	<i>Seq.</i>	<i>NONE</i>
MANUFACTURER: <i>WESTINGHOUSE CORP.</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>21</i>	<i>Seq.</i>	<i>NONE</i>
MODEL NUMBER: <i>TBDP</i>	Chemical Spray	<i>2000 ppmB 1.14 wt % Acid PH 9-11</i>	<i>2500 ppmB 1.42 wt % Acid PH 9.50</i>	<i>7.5, 314.5 314.5.6</i>	<i>21</i>	<i>Seq.</i>	<i>NONE</i>
FUNCTION: <i>CIRCULATE AIR</i>	Radiation (10 ⁶ rads)	<i>150</i>	<i>200</i>	<i>WCAP 7410-L VOL</i>	<i>21</i>	<i>Seq.</i>	<i>NONE</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)					<i>Seq.</i>	
SERVICE: <i>VARIOUS</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
LOCATION: <i>INSIDE CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>YES</i>							

*Documentation References:

21. Westinghouse Corp. Test Report WCAP-7829.
 63. Req'd Time Qual. Analysis.

Notes:



from Ref. 21.

Qualified by Westinghouse Corp. Test Report\$:
WCAP-7829, April, 1972.

Type of Test: Sequential: Irradiation
Steam
Chemical Spray

Test Profile (for motor without heat exchanger)

324°F, 80 psig for 4 hrs.
250°F, 16 psig for 7 days

Test Profile (for motor with heat exchanger)

320°F, 75 psig for 24 hrs.
250°F, 16 psig for 168 hrs.

Chemical Spray: 1.43 weight percent boric acid
PH=9.5 with Na OH

Irradiation: .5 Mrad/hr., 200 Mrads.

See page 33 of WCAP-7829 for Test Profile summary.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 day</i>	<i>> 1 yr</i>	<i>See Note C</i>	<i>Ref. 47</i>	<i>TEST</i>	<i>NONE</i>
PLANT ID NO: <i>MOBILUX EP-2</i>	Temperature (°F)	<i>Fig 022.9-1, -2</i>	<i>250 cont. service 350 drop pt.</i>	<i>FSAR App D</i>	<i>Ref. 48</i>	<i>Tech. Description Sheet</i>	<i>NONE</i>
COMPONENT: <i>GREASE</i>	Pressure (PSIA)	<i>Fig 1 Fig 2</i>	<i>See Note A</i>	<i>AEW 6504</i>	<i>Ref. 48</i>	<i>"</i>	<i>NONE</i>
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>Ref. 48</i>	<i>"</i>	<i>NONE</i>
MODEL NUMBER: <i>MOBILUX EP-2</i>	Chemical Spray	<i>2000 ppm B 114 wt % Acetic PH 9-11 Acid</i>	<i>See Note B</i>		<i>NA</i>	<i>NA</i>	<i>NONE</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>26</i>	<i>240</i>	<i>WCAP 7410-L Vol 1</i>	<i>Ref. 47</i>	<i>TEST</i>	<i>NONE</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NONE</i>
SERVICE: <i>VARIOUS - VALVE OPERATOR MOTORS</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NONE</i>
LOCATION: <i>IN + Out Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>yes</i>							

*Documentation References:

47. Qual. by Letter of 6-2-71

FROM: WAF Hergroctor - Customer Service LAB
Bklyn, NY.

TO: A.H. Statton - Boston Edison Co.

48. Letter of 4-17-80 from J.M. Allen (Mobil Oil Corp.) to Allen Feibelman (AEP).

Notes:

A. Refer to Tech. Description Sheet.

B. Grease enclosed in a container will not be subjected to direct acoustic spray impingement.

C. Letters from J. Tillinghast (AEP) to K. Kniel (NRC) dated 4-14-75 and 9-29-75.



Mobilux® EP 0, 1, 2

Extreme Pressure Industrial Greases

Mobilux EP 0, 1, and 2 are unleaded multiservice, extreme pressure greases designed for normal through heavy-duty industrial applications. They are formulated to resist the effects of both the extremely heavy loads and shock loads to which plant equipment is commonly exposed. Heavy loads tend to squeeze lubricant from mating surfaces, and shock loads rupture the lubricant film, thus creating a condition of metal-to-metal contact and causing parts wear, shortening equipment life. Equipment experiencing these loading extremes may also be exposed to conditions where extremes of temperature, moisture, or water washing are present. Greases for these applications must provide good extreme pressure characteristics and cling strongly to resist the pressures and pounding to which they are exposed. They must also provide good protection against rust and corrosion, resist water washing and dispense and lubricate satisfactorily over a broad range of temperature. The Mobilux EP greases fulfill these requirements.

PRODUCT DESCRIPTION

The Mobilux EP greases are lithium 12 hydroxystearate soap based greases which contain an unleaded EP additive and

oxidation, rust and corrosion inhibitors. They are smooth textured, brown colored greases in the NLGI No. 0, 1, or 2 consistency classification.

The use of lithium 12 hydroxystearate as the soap base for these greases ensures good resistance to softening under severe working, good water resistance and a consistency which will remain relatively constant over the recommended operating temperature range.

The extreme pressure characteristic of the Mobilux EP greases is supplied by an unleaded additive which provides them with exceptional wear protection, also improving their ecological acceptability. Other formulation improvements provide good water wash resistance, low temperature dispensing, and long service life in bearings operating at elevated temperatures.

The petroleum oil used in the greases meets the lubrication requirements of most heavy-duty industrial operations. It also provides low-temperature pumpability and enhances the greases' high temperature oxidation resistance.

The Mobilux EP greases pass the ASTM Rust Test (D 1743) and are noncorrosive to steel and copper. The latter is of importance because of the use of bronze cages in many anti-friction bearings. The greases show good resistance to bleeding and superior resistance to water washout. Their load carrying and antiwear characteristics are illustrated by their Timken OK load of 40 lbs., 18.2 Kg.

Characteristic	Mobilux EP 0	Mobilux EP 1	Mobilux EP 2
NLGI No.	0	1	2
Structure	smooth	smooth	smooth
Soap Type	Unleaded Lithium 12 Hydroxystearate		
Color	brown	brown	brown
Penetration at 77°F (25°C)			
Unworked, min-max	350-390	305-345	260-300
Worked 60 strokes, min-max	355-385	310-340	265-295
Dropping Point, min. F (C)	340 (171)	340 (171)	350 (177)
Mineral Oil %	92	89	87
Viscosity			
SUS at 100°F	750	750	750
SUS at 210°F	75	75	75
cSt at 40°C	143	143	143
cSt at 100°C	13.8	13.8	13.8
Timken OK Load, min. lb (kg)	40 (18)	40 (18)	40 (18)
Rust Test ASTM D 1743	Pass	Pass	Pass
Bomb Oxidation Stability			
ASTM D942			
PSI Drop, max	10	10	10

Mobilux EP 0, 1, 2

TYPICAL CHARACTERISTICS

Physical and chemical characteristics of the Mobilux EP greases are shown in the data sheet table. Values not shown as maximums or minimums are typical characteristics and may vary slightly.

APPLICATION

Mobilux EP greases are recommended for the lubrication of plain and rolling element bearings in normal through heavy-duty industrial applications. They are particularly recommended where loads are high or shock loads are present, or where severe vibration is a problem. They are also suitable for the lubrication of geared couplings. The softer grade may be considered for the lubrication of gear sets that do not have oil-tight cases.

Mobilux EP 0 and 1 greases have excellent handling and dispensing properties at low temperature. The lowest recommended ambient temperature for operating bearings lubricated with Mobilux EP 0 or 1 is about -20°F (-29°C); and for Mobilux EP 2, a stiffer grease, about -10°F (-23°C).

All Mobilux EP greases are recommended for the lubrication of plain bearings. The highest operating temperature recommended for these greases is 250°F (121°C). For continuous service at temperatures above 200°F, proper purging and relubrication frequencies are critical to maintenance of correct bearing protection.

The excellent water resistance and rust and corrosion protection afforded by the Mobilux EP greases makes them particularly applicable for equipment such as the wet ends of paper machines, steel mill hot strip rolling operations, underground mining equipment, tunneling projects and ore crushing plants where moisture or wet conditions are com-

mon. Their excellent dispensing characteristics will also be advantageous in many of these applications because of the exposed nature of the operations.

Mobilux EP greases are compatible with some other greases, particularly those made with lithium soap. However, the best procedure is not to mix greases of different soap types. When replacing another grease with a Mobilux EP grease, the previously used grease should be completely cleaned or flushed from the system.

In plants where human or animal foods are being processed, Mobilux EP greases, despite their unleaded extreme pressure formulation, are not recommended for applications where contamination of food could result. Mobilux EP greases have U.S. Department of Agriculture (USDA) Category BB approval.

ADVANTAGES

When used as recommended, the Mobilux EP greases will provide the following outstanding benefits and advantages:

Superior lubrication under heavy or shock loading

Good load carrying ability

Longer service life in bearings at temperatures up to 250°F

Good low temperature dispensing characteristics

Excellent resistance to water washing

Good rust protection and corrosion resistance

Extreme pressure protection with an unleaded formulation

Reduction of plant inventories through multipurpose capabilities

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD		OUTSTANDING ITEMS	
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: <i>ESSENTIAL SERVICE WATER</i>	Operating Time	<i>500 hours for Pump</i>	<i>N/A</i>	<i>Mfg. Lit.</i>	<i>—</i>	<i>TESTS + CONSULTATION WITH MOBIL</i>		<i>NONE</i>	
PLANT ID NO: <i>PP-007</i>	Temperature (°F)	<i>110 AMBIENT</i>	<i>250 contin. service 350 drop pt.</i>	<i>FSAR Sect 7.7.2</i>	<i>#48</i>				
COMPONENT: <i>PUMP GEARCASE</i>	Pressure (PSIA)	<i>1500</i>	<i>No effect</i>	<i>Mfg. Lit.</i>	<i>—</i>				
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>N/A</i>	<i>No effect</i>	<i>—</i>	<i>—</i>				
MODEL NUMBER: <i>MOBILUX #2</i>	Chemical Spray	<i>N/A</i>	<i>N/A</i>	<i>—</i>	<i>—</i>				
FUNCTION: <i>Lubrication</i>	Radiation (10 ⁶ rads)	<i>N/A</i>	<i>100</i>	<i>—</i>	<i>#48</i>				
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Aging (years)	<i>N/A</i>	<i>N/A</i>	<i>—</i>	<i>—</i>				
SERVICE: <i>ESW PUMP</i>									
LOCATION: <i>Aux Bldg, 571-D</i>									
FLOOD LEVEL ELEV: <i>N/A</i> ABOVE FLOOD LEVEL: <i>N/A</i>	Submergence	<i>N/A</i>	<i>N/A</i>	<i>—</i>	<i>—</i>				

*Documentation References: 48, Letter of 4-17-80 from J.A. Allen (Mobil) Notes:

*G. A. Feibelman (AEP),
Pump manufacturer recommends the following greases:*

Shell Oil Co. - Darina EP #2
Mobil Oil Co. - Mobilux EP #2
Phillips Petroleum Co. - Philube EP #2
Std. Oil of Co. - Chevron Industrial Grease - Heavy
Union Oil Co. - Royal Unoba #2
Texaco Inc. - Multifak #2
Atlantic Richfield Oil Co. - Rocolube #2 MP

*AEP uses Mobilux No. 2 grease,
recommended by Mobil as
suitable for this application*

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD		OUTSTANDING ITEMS	
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: <i>CONTAINMENT SPRAY</i>	Operating Time	<i>N/A</i>	<i>N/A</i>	<i>—</i>	<i>—</i>	<i>TESTS + CONSULTATION WITH MOBIL</i>		<i>NONE</i>	
PLANT ID NO: <i>PP-009</i>	Temperature (°F)	<i>AMBIENT 110</i>	<i>250 contin. service 400 flash pt.</i>	<i>FSAR Sect. 9.7.2</i>	<i>#48</i>				
COMPONENT: <i>MOTOR OIL</i>	Pressure (PSIA)	<i>N/A</i>	<i>NO EFFECT</i>	<i>—</i>	<i>—</i>				
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>N/A</i>	<i>NO EFFECT</i>	<i>—</i>	<i>—</i>				
MODEL NUMBER: <i>DTE OIL MEDIUM</i>	Chemical Spray	<i>N/A</i>	<i>N/A</i>	<i>—</i>	<i>—</i>				
FUNCTION: <i>LUBRICATION</i>	Radiation (10 ⁶ rads)	<i>1.7</i>	<i>100</i>	<i>AEPSC NS&L CALC. DC-N-6420-2</i>	<i>#48</i>				
ACCURACY: SPEC: <i>N/A</i> DEMON:	Aging (years)	<i>N/A</i>	<i>N/A</i>	<i>—</i>	<i>—</i>				
SERVICE: <i>CTS Pump Motor</i>	Submergence	<i>N/A</i>	<i>N/A</i>	<i>—</i>	<i>—</i>	<i>Y</i>		<i>Y</i>	
LOCATION: <i>Aux Bldg EL. 573'-0"</i>									
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: <i>N/A</i>									

*Documentation References:

Notes:

48. Letter of 4-17-80 from J.M. Allen (Mobil)
to A. Feilbman (AEP).

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD		OUTSTANDING ITEMS	
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: <i>CONTAINMENT SPRAY</i>	Operating Time	<i>N/A</i>	<i>N/A</i>	—	—	<i>TESTS + CONSULTATION WITH MOBIL</i>		<i>MOBIL</i>	
PLANT ID NO: <i>PP-009</i>	Temperature (°F)	<i>AMBIENT 110</i>	<i>250 cont. service 350 drop pt.</i>	<i>FSAR Sect. 9.7.2</i>	<i>#48</i>				
COMPONENT: <i>MOTOR GREASE</i>	Pressure (PSIA)	<i>N/A</i>	<i>No effect</i>	—	—				
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>N/A</i>	<i>No effect</i>	—	—				
MODEL NUMBER: <i>MOBILUX #2</i>	Chemical Spray	<i>N/A</i>	<i>N/A</i>	—	—				
FUNCTION: <i>LUBRICATION</i>	Radiation (10 ⁶ rads)	<i>17</i>	<i>100</i>	<i>AEPSC NSRL calc. De-N-6420-2</i>	<i>#48</i>				
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Aging (years)	<i>N/A</i>	<i>N/A</i>	—	—				
SERVICE: <i>CTS Pump Motor</i>	Submergence	<i>N/A</i>	<i>N/A</i>	—	—				
LOCATION: <i>Aux Bldg El 573'0"</i>									
FLOOD LEVEL ELEV: <i>N/A</i>									
ABOVE FLOOD LEVEL: <i>N/A</i>									

*Documentation References:

Notes:

48. Letter dated 4-17-80 from J. A. Allen (H&I)
to A. Teibelman (AEP).

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS		
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: <i>COMPONENT COOLING WATER</i>	Operating Time	<i>N/A</i>	<i>N/A</i>	—	—	<i>TESTS CONDUCTED WITH N. 201</i>	<i>NONE</i>		
PLANT ID NO: <i>PP-010</i>	Temperature (°F)	<i>AMBIENT 110</i>	<i>Flash pt. 410</i>	<i>FSAR 9.9.2</i>	<i># 48</i>				
COMPONENT: <i>Pump Oil</i>	Pressure (PSIA)	<i>N/A</i>	<i>NO EFFECT</i>	—	—				
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>N/A</i>	<i>NO EFFECT</i>	—	—				
MODEL NUMBER: <i>DTE 797 0.1</i>	Chemical Spray	<i>N/A</i>	<i>N/A</i>	—	—				
FUNCTION: <i>Lubrication</i>	Radiation (10 ⁶ rads)	<i>N/A</i>	<i>100</i>	—	<i># 48</i>				
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Aging (years)	<i>N/A</i>	<i>N/A</i>	—	—				
SERVICE: <i>CCW Pump</i>	Submergence	<i>N/A</i>	<i>N/A</i>	—	—	<i>✓</i>	<i>✓</i>		
LOCATION: <i>Area B106 Fl. 607'-6"</i>									
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: <i>N/A</i>									

*Documentation References: 48. Letter of 4-17-80 from J. M. Allen (1661) Notes:

to A. Feibelman (AEP).
Pump Manufacturer recommends oil with characteristics:

<u>Oil Characteristics</u>	<u>Naphthene Base</u>	<u>Paraffin Base</u>
Flash Point	300°F, min	360°F, min
Saybolt Viscosity 100°F	150 sec, min 200 sec, max	140 sec, min 185 sec, max
Pour Point	50°F max	30°F, max

AEP uses Mobil D.T.E 797 0.1, a paraffinic oil which meets mfg specifications.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD		OUTSTANDING ITEMS	
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: <i>COMPONENT COOLING WATER</i>	Operating Time	<i>N/A</i>	<i>N/A</i>	—	—	<i>TESTS + CONVICTION WITH N/PAIL</i>		<i>NONE</i>	
PLANT ID NO: <i>PP-DID</i>	Temperature (°F)	<i>AMBIENT 110</i>	<i>250 cont. Service 350 drop pt.</i>	<i>FSAR Sect 9.2.2</i>	<i>#48</i>				
COMPONENT: <i>COUPLING GREASE</i>	Pressure (PSIA)	<i>N/A</i>	<i>NO EFFECT</i>	—	—				
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>N/A</i>	<i>NO EFFECT</i>	—	—				
MODEL NUMBER: <i>COUPLING GREASE</i>	Chemical Spray	<i>N/A</i>	<i>N/A</i>	—	—				
FUNCTION: <i>LUBRICATION</i>	Radiation (10 ⁶ rads)	<i>N/A</i>	<i>100</i>	—	<i>#48</i>				
ACCURACY: SPEC: <i>N/A</i> DEMON:	Aging (years)	<i>N/A</i>	<i>N/A</i>	—	—				
SERVICE: <i>CCW Pump Coupling</i>	Submergence	<i>N/A</i>	<i>N/A</i>	—	—	<i>✓</i>		<i>✓</i>	
LOCATION: <i>Area B106 E1 109'-6"</i>									
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: <i>N/A</i>									

*Documentation References: *48. Letter of 4-17-80 from J.M. Allen (Mobil) to A. Feibelman (AEP).* Notes:

Coupling manufacturer recommends grease with NGLI No. 2 with worked penetration value of 250 to 300.

AEP uses Mobilux No. 2 grease which meets mfg specs.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS		
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: SAFETY INJECTION	Operating Time	N/A	N/A	—	—	TESTS + CONSULTATION WITH MOBIL	None		
PLANT ID NO: PP-026	Temperature (°F)	AMBIENT 110	flash pt. 410	FSAR, Sect 7.9.2	# 48				
COMPONENT: Pump Oil	Pressure (PSIA)	N/A	NO EFFECT	—	—				
MANUFACTURER: MOBIL	Relative Humidity (%)	N/A	NO EFFECT	—	—				
MODEL NUMBER: DTE 797 Oil	Chemical Spray	N/A	N/A	—	—				
FUNCTION: Lubrication	Radiation (10 ⁶ rads)	1.7	100	AEPSC NS&L Calc. DC-N-3420-2	# 48				
ACCURACY: SPEC: N/A DEMON:	Aging (years)	N/A	N/A	—	—				
SERVICE: SI Pump									
LOCATION: Avx B106 EL. 587'-0"									
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A	Submergence	N/A	N/A	—	—	▽	▽		

*Documentation References: 48. Letter of 4-17-80 from J. M. Allen Notes:

(Mobil) to A. Teibelman (AEP).
 Pump manufacturer recommends high grade turbine oil with a viscosity of 150 SSU @ 100°F. } AEP uses Mobil DTE 797 oil which meets listed spec.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS		
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: <i>SAFETY INJECTION</i>	Operating Time	<i>N/A</i>	<i>N/A</i>	—	—	<i>TESTS + CONSULTATION WITH AEP</i>	<i>NONE</i>		
PLANT ID NO: <i>PP-026</i>	Temperature (°F)	<i>AMBIENT 110</i>	<i>250 cont. service 400 flash pt.</i>	<i>FSAR Sect 7.7.2</i>	<i># 48</i>				
COMPONENT: <i>MOTOR OIL</i>	Pressure (PSIA)	<i>N/A</i>	<i>NO EFFECT</i>	—	—				
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>N/A</i>	<i>NO EFFECT</i>	—	—				
MODEL NUMBER: <i>DTE OIL Heavy Medium</i>	Chemical Spray	<i>N/A</i>	<i>N/A</i>	—	—				
FUNCTION: <i>Lubrication</i>	Radiation (10 ⁶ rads)	<i>17</i>	<i>100</i>	<i>AEPSC NSRL calc. DC-N. 6420-2</i>	<i># 48</i>				
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Aging (years)	<i>N/A</i>	<i>N/A</i>	—	—				
SERVICE: <i>SI Pump Motor</i>	Submergence	<i>N/A</i>	<i>N/A</i>	—	—				
LOCATION: <i>Avx Bldg Et. 587'-0"</i>									
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: <i>N/A</i>									

*Documentation References: *48, letter of 4-17-80 from J. M. Allen (Mobil) to A. Feibelman (AEP).* Notes:

Motor manufacturer recommends oil with viscosity of 180 to 220 SSV @ 100°F. } AEP uses Mobil DTE Oil Heavy Medium.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS		
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: <i>RESIDUAL HEAT REMOVAL</i>	Operating Time	<i>N/A</i>	<i>N/A</i>	—	—	<i>TESTS + CONSULTATION WITH MOBIL</i>	<i>NONE</i>		
PLANT ID NO: <i>PP-035</i>	Temperature (°F)	<i>110</i> <i>AMBIENT</i>	<i>250 cont. service</i> <i>350 drop pt.</i>	<i>FSAR Sect. 9.9.2</i>	<i>1F</i> <i>48</i>				
COMPONENT: <i>PUMP + MOTOR GREASE</i>	Pressure (PSIA)	<i>N/A</i>	<i>No effect</i>	—	—				
MANUFACTURER: <i>MOBIL</i>	Relative Humidity (%)	<i>N/A</i>	<i>No effect</i>	—	—				
MODEL NUMBER: <i>MOBILUX #2</i>	Chemical Spray	<i>N/A</i>	<i>N/A</i>	—	—				
FUNCTION: <i>Lubrication</i>	Radiation (10 ⁶ rads)	<i>17</i>	<i>100</i>	<i>AEPSC NS&L calc. DC-N-6420-2</i>	<i>118</i>				
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Aging (years)	<i>N/A</i>	<i>N/A</i>	—	—				
SERVICE: <i>RHR Pump</i> <i>RHR Pump Motor</i>	Submergence	<i>N/A</i>	<i>N/A</i>	—	—	<i>↓</i>			<i>↓</i>
LOCATION: <i>Five Sigs.</i> <i>EL. 573'-0"</i>									
FLOOD LEVEL ELEV: <i>N/A</i>									
ABOVE FLOOD LEVEL: <i>N/A</i>									

*Documentation References: *48, Letter of 4-17-80 from J.M. Allen (Mobil) to A. Feibelman (AEP).* Notes:

Motor Manufacturer recommends

Westinghouse Grease #55272-BA

AEP uses Mobilux No. 2 Grease, recommended by Mobil as a suitable substitute.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS		
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: CVCS/ECCS	Operating Time	N/A	N/A	—	—	TEST CONSULTATION WITH MCOIL	NONE		
PLANT ID NO: PP-050	Temperature (°F)	AMBIENT 110	250 cont. service 400 flash pt.	FSAP Section 9.9.2	# 48				
COMPONENT: Pump + Motor Oil	Pressure (PSIA)	N/A	NO EFFECT	—	—				
MANUFACTURER: Mobil	Relative Humidity (%)	N/A	NO EFFECT	—	—				
MODEL NUMBER: D.T.E Oil Heavy Medium	Chemical Spray	N/A	N/A	—	—				
FUNCTION: Lubrication	Radiation (10 ⁶ rads)	17	100	AEPSC NS&L calc. DC-N-6420-2	# 48				
ACCURACY: SPEC: N/A DEMON:	Aging (years)	N/A	N/A	—	—				
SERVICE: CCH ₁ Pump	Submergence	N/A	N/A	—	—	▽	▽		
LOCATION: Aux Bldg. E1 587' 0"									
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A									

*Documentation References: 48. Letter of 4-17-80 from J. M. Allen (Mobil) Notes:

Pump manufacturer recommends using high grade mineral oil of the turbine type, having viscosity of 150-250 SSU @ 100°F.

Motor manufacturer recommends bearing oil with a viscosity of 200 SSU @ 100°F

Gear case manufacturer recommends oil with viscosity of 180-240 SSU @ 100°F

AEP. uses Mobil D.T.E Oil Heavy Medium.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS		
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.				
SYSTEM: CVCS/ECCS	Operating Time	N/A	N/A	—	—	TESTS CONDUCTED WITH MOBIL	NONE		
PLANT ID NO: PP-050	Temperature (°F)	AMBIENT 110	drop pt. 400	ISAP Std 9.9.2	# 48				
COMPONENT: COUPLING BRASS	Pressure (PSIA)	N/A	NO EFFECT	—	—				
MANUFACTURER: Mobil	Relative Humidity (%)	N/A	NO EFFECT	—	—				
MODEL NUMBER: Sovarex L-0	Chemical Spray	N/A	N/A	—	—				
FUNCTION: Lubrication	Radiation (10 ⁶ rads)	17	100	AEPSC NSRL calc. DC-N-6820-2	# 48				
ACCURACY: SPEC: DEMON: N/A	Aging (years)	N/A	N/A	—	—				
SERVICE: Cent. Charging Pump Coupling	Submergence	N/A	N/A			✓			✓
LOCATION: Aux Bldg EL 587'-0"									
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A									

* Documentation References: 48. Letter of 4-17-50 from A.M. Allen (Mobil) to A. Feibelman (AEP). Notes:

Coupling manufacturer recommends the following greases:

ATLANTIC REFINING COMPANY
AMERICAN OIL COMPANY
DOCKS OIL COMPANY
SHELL SERVICE PETROLEUM, Inc.
CONTINENTAL OIL COMPANY
WYVE BROTHERS REFINING COMPANY
ARF OIL CORPORATION
ARABIAN OIL AND REFINING COMPANY
KEystone LUBRICATING COMPANY
WESTER LUBRICANTS COMPANY
ILLIPS PETROLEUM COMPANY
RE OIL COMPANY

ATLANTIC LUBRICANT #17
AMOBAR S
LEADOLINE 375 LIGHT
TROJAN GREASE A-1
CONOCO SUPER LUBE
LUBRIPLATE #630 AA
CROWN #1
FIBRAX 370 OR NEBULA EP 0
KEYSTONE #15 EP XX LIGHT
LUBRIKO GREASE M-34
PHILUBE #1 STOCK 401
POCO FIBRE GREASE #1

RICHFIELD OIL CORPORATION
SHELL OIL COMPANY
SINCLAIR REFINING COMPANY
SOCONY-MOBIL OIL CO., Inc.
STANDARD OIL CO. OF CALIFORNIA
STANDARD OIL CO. OF OHIO
SUN OIL COMPANY
TEXAS COMPANY
TIDEWATER ASSOCIATED OIL CO.
UNION OIL CO. OF CALIFORNIA

ROCOLUBE RR
SHELL ALVANIA GREASE #2
SIMNIA 012
SINCOLUBE #1, OR LITHOLINE
MULTI-PURPOSE GREASE #2
→ SOVAREX L-0
MOBILPLEX EP #0
CALOL SA #1
SOHIO #77
N 751 AND 741 EP
MARFAK #1
TYCOL ALITHO #10
BALL ROLL #1 OR EINOBA #1

AEP uses Mobil Sovarex L-0 grease.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Hydrogen Recombiner	Operating Time	3 months	33mo.	Table 75-2	63 20	Combination	NONE
PLANT ID NO: HR-1 HR-2	Temperature (°F)	Fig 13.13-1	310	FSAR APP D	20	Sep.	NONE
COMPONENT: Hydrogen Recombiners	Pressure (PSIA)	Fig 2 Fig 1	77	AEW 6504	20	Sep.	NONE
MANUFACTURER: Westinghouse	Relative Humidity (%)	100	100		20	Sep.	NONE
MODEL NUMBER: NA	Chemical Spray	2000 ppmB 1.14 wt % Boric PH 9-11 Acid	2500 ppmB 1.143 wt % Boric PH 10 Acid	T.S. 3/4.5 3/4.6	20	Sep.	NONE
FUNCTION: Hydrogen Recombiner	Radiation (10 ⁶ rads)	85	200	WCAP 7410-L Vol 1	20	Sep.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: Hydrogen Recombiner	Submergence	NA	NA		NA	NA	NA
LOCATION: Inside Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: YES							

*Documentation References:

20. Westinghouse Corp. Test Report WCAP-7709-L, Suppl. 2
-63. Req'd Time Qual. Analysis

Notes: 80 heatup and cooldown.

Ref. 20.

Qualified by Westinghouse report WCAP-7709-L, supplement 2 of Sept. 1973.

Type of Test: Separate, seismic steam/chem. spray gamma radiation.

Test Profile:

Horizontal (side-to-side) force = 2g
(back-to-back) force = 2g

Vertical force = 1.33g

Frequencies = 1 through 35 Hz

.33 to .80 Mrads/hr
200-220 Mrads

Assumed (310°F, 77 psia for 4 hrs
saturated) 259°F, 35 psia for 20 hrs
steam. (228°F, 20 psia for 1 hr

Chemical Spray: Sodium thiosulfate 2500 ppm boron as boric acid with Na OH added for a PH = 10.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST H	Operating Time	4 MONTH	4 MONTH	Q ^(B) 030.1	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
PLANT ID NO: BLP-110/111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122	Temperature (°F)	160	160	FIG N 13.13-2	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER	Pressure (PSIA)	26.2	25.12-14.7	FIG N 5.3-11	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
MANUFACTURER: ITT BARTON	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL	NONE
MODEL NUMBER: 764	Chemical Spray	1.14% BOKIC ACID & 15% NHOH pH 8.5	1.14% BOKIC ACID & 11% NHOH pH 8.55	N 5.3.6	REF 30	SEQUENTIAL	NONE
FUNCTION: LONG TERM POST ACCIDENT & NO. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30 ACCURACY: SPEC: +10% DEMON: -5%	Radiation (10 ⁶ rads)	6	50	REF 30	REF 30	COMBINED EFFECTS	NONE
SERVICE: STEAM GENERATOR LEVEL	Aging (years)						
LOCATION: INSIDE CONTAINMENT	Submergence	12 FT	75 PSIG	DRVG 5570E	ENRG JDLMT	ENGINEERING REVIEW	NONE
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO							

*Documentation References: UNLESS OTHERWISE SPECIFIED, ALL REFERENCES ARE TO THE FOLLOWING:
30- WESTINGHOUSE ELECTRIC CORP.
COMMON DATA NS-TM-1750

Notes: (B) REQUIREMENTS ADDRESSED IN PLANS H-1.20
WHICH WERE SUBMITTED IN RESPONSE TO QUESTION 10.1
THESE DEVICES WERE NOT CALIBRATED WITH
ASSUMED OPERATION FOR ANY ACCIDENT ANALYSIS
CONDUCTED IN AN ADVERSE ENVIRONMENT.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST H PLANT ID NO: BLP-110, 111, 112, 120, 121, 122, 130, 131, 132, 140, 141 & 142 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: ITT BARTON MODEL NUMBER: 764 FUNCTION: ACTUATION ACCURACY: SPEC: +10% DEMON: -25% SERVICE: STEAM GENERATOR LEVEL LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO	Operating Time	22.1s 22.1s	41.5s 10 MIN	TABLE 11.2.8-1	TABLE 11.2.8-1 REF 30	RESPONSE TIME TEST SEQUENTIAL	NONE
	Temperature (°F)	328.7	360	Q FIG 022.9-1 E-2	REF 30	SEQUENTIAL	NONE
	Pressure (PSIA)	22	89.7 & 14.7	N13.7-2	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL	NONE
	Chemical Spray	1.14% BORIC ACID & .15% NaOH	1.14% BORIC ACID & .17% NaOH	N 5.2.6	REF 30	SEQUENTIAL	NONE
	Radiation (10 ⁶ rads)	0.6	50	REF 30	REF 30	COMBINED EFFECTS	NONE
	Aging (years)						
	Submergence	12 FT.	75 PSIG	DRWG 5570E	ENGRG JGDMT	ENGINEERING REVIEW	NONE

*Documentation References: UNLESS OTHERWISE NOTED
 ALL REFERENCES ARE FSAR SECTIONS.
 REF 30 = WESTINGHOUSE ELECTRIC CORP
 COMMUNICATION: NS-TMA-1950

Notes: 11.2.8 IS THE ACCIDENT ANALYSIS GENERATING
 AN ADVERSE ENVIRONMENT FOR WHICH CREDIT IS ASSUMED
 FOR OPERATION OF THESE DEVICES.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: AUXILIARY FEEDWATER PLANT ID NO: CLR 110 2 III COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: T: INSTRUMENT MODEL NUMBER: 1100012 FUNCTION: FEEDWATER ACCURACY: SPEC: DEMON: SERVICE: CONDENSATE TANK LEVEL LOCATION: INSIDE PLANT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:

THE TRANSMITTER IS LOCATED SUCH THAT NO SOURCE-TARGET INTERACTION OR ADVERSE ENVIRONMENT WILL EFFECT IT. THE SIGNAL LINES ARE SUBJECT TO MSLE AND MFSLB ENVIRONMENT. IF THE SIGNAL LINE (PNEUMATIC) CAUSES THE SIGNAL TO GO TO ZERO, THE OPERATOR WILL CAUSE THE OPERATOR TO SWITCH TO AUXILIARY FEEDWATER BACKUP SOURCE.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MAIN FEEDWATER PLANT ID NO: FCC 210, 211, 212, 213, 230, 231, 240 COMPONENT: DIFFERENTIAL TRANSMITTER MANUFACTURER: MODEL NUMBER: FUNCTION: NORMAL MONITOR ACCURACY: SPEC: $\pm 16\%$ DEMON: -11.75% SERVICE: MAIN FEEDWATER LOCATION: OUTSIDE FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL:	Operating Time	1.5 ± 75 SEC	≤ 1.5 15 min	TABLE 0-212 0-213	TECH SPEC 0-212 0-213	RESPONSE TIME TEST COMBINED EFFECT	NONE
	Temperature (°F)	223	290	FIG 0-212	WCAP 8541	SEQUENTIAL	NONE
	Pressure (PSIA)	5.8	74.7	FIG 0-212	WCAP 8541	SEQUENTIAL	NONE
	Relative Humidity (%)	100	100	7.5	WCAP 8541	SEQUENTIAL	NONE
	Chemical Spray	NA	NA	NA	NA		NONE
	Radiation (10^6 rads)	NA	NA	NA	NA		NONE
	Aging (years)						
	Submergence	NA	NA	NA	NA		NONE

*Documentation References: UNLESS OTHERWISE NOTED
ALL DATA VALUES ARE EXACT FIGURES.
W. L. BELL - WESTINGHOUSE ELECTRIC CORP.
TYPICAL REPORT FOR ENVIRONMENTAL
TESTING OF TYPE B TRANSMITTERS

Notes: 0.4.2 & 14.2.8 ARE THE REVERSE ENVIRONMENT
GENERATING ACCIDENT ANALYSIS FOR WHICH
CREDIT IS ASSIGNED FOR OPERATION OF THESE
DEVICES.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: AUXILIARY FEEDWATER PLANT ID NO: CLR 110 E III COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: TAYLOR INSTRUMENT MODEL NUMBER: 304 TD 00212 FUNCTION: MONITORING ACCURACY: SPEC: DEMON: SERVICE: CONDENSATE TANK TANK LEVEL LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:

THE TRANSMITTER IS LOCATED SUCH THAT NO SOURCE-TARGET INTERACTION OR ADVERSE ENVIRONMENT WILL EFFECT IT. THE SIGNAL LINES ARE SUBJECT TO MSLB AND MFWLB ENVIRONMENT. HOWEVER, DAMAGE OF THE SIGNAL LINE (PNEUMATIC) CAUSES THE SIGNAL TO GO TO ZERO THEREBY CAUSING THE OPERATOR TO SWITCH TO AUXILIARY FEEDWATER BACKUP SOURCE.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: AUXILIARY FLOW WATER	Operating Time	4 MONTHS	NOTE (L)	14.2.8	NOTE (L)	NOTE (L)	NONE
PLANT ID NO: FFI 210 1 1 230 & 240	Temperature (°F)	230		FIG 0.27			NONE
COMPONENT: DIFFERENTIAL UTILITY TRANSMITTER	Pressure (PSIA)	26.2		FIG 0.27			NONE
MANUFACTURER: FOXBORO	Relative Humidity (%)	100	X	7.5	X	X	NONE
MODEL NUMBER: 1-E13DM-H-T-M1-D	Chemical Spray	NH					NONE
FUNCTION: MONITORING	Radiation (10 ⁶ rads)	NH					NONE
ACCURACY: SPEC: DEMON:	Aging (years)						
SERVICE: AUXILIARY FLOW WATER FLOW	Submergence	NH					NONE
LOCATION: OUTSIDE ATTACHMENT							
FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL:							

*Documentation References: THE FOLLOWING ARE NOTED FOR EACH DEVICE FROM THE TEST CONDITIONS.

Notes: (L) PRESENTLY INSTALLED DEVICES ARE PART OF THE QUALIFICATION TEST PROGRAM FOR UTILITY TRANSMITTER QUALIFICATION GROUP BEING PERFORMED TO MEET THE REQUIREMENTS OF NUREG CR-578 ITEM 2.1.7.b. SEE REF: NRL: 00253 DATED OCT. 24 1979.

THESE DEVICES HAVE NOT EXPOSED TO LONG TERM RADIATION EXPOSURE DOSES.

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TEST COMPLETION IS ANTICIPATED IN SOME TIME.

REF: NRL: 00578



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MAIN FEEDWATER REACTION TRIP DEVIATION	Operating Time	1.5 & 25 SEC	$\leq 1.5s$ 15 min	TABLE 0-27 & 0-28	TECH SPEC 3.35 WCAP 8541	RESPONSE TIME TEST COMBINED EFFECT	NONE
PLANT ID NO: FCC 210, 211, 220, 221, 230, 231, 240 { 241	Temperature (°F)	223	290	FIG 0-26	WCAP 8541	SEQUENTIAL	NONE
COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: FOXBORO	Pressure (PSIA)	5.8	74.7	FIG 0-26	WCAP 8541	SEQUENTIAL	NONE
MODEL NUMBER: E13DM-HSDM1 (MCA)	Relative Humidity (%)	100	100	7.5	WCAP 8541	SEQUENTIAL	NONE
FUNCTION: NORMAL MONITOR & ACTUATION	Chemical Spray	NA	NA	NA	NA		NONE
ACCURACY: SPEC: $\pm 16\%$ DEMON: -11.75%	Radiation (10^6 rads)	NA	NA	NA	NA		NONE
SERVICE: MAIN FEEDWATER 110V	Aging (years)						
LOCATION: OUTSIDE CONTAINMENT	Submergence	NA	NA	NA	NA		NONE
FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A							

*Documentation References: UNLESS OTHERWISE NOTED
ALL REFERENCES ARE FOR SECTIONS.
WCAP 8541 - WESTINGHOUSE ELECTRIC CORP
TOPICAL REPORT FOR ENVIRONMENTAL
TESTING OF FOXBORO TRANSMITTERS

Notes: 0.4.2 & 14.2.8 ARE THE ADVERSE ENVIRONMENT
GENERATING ACCIDENT ANALYSIS FOR WHICH
CREDIT IS ASSUMED FOR OPERATION OF THESE
DEVICES.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY PLANT ID NO: IFC 315 COMPONENT: DIFFERENTIAL MANUFACTURER: MODEL NUMBER: FUNCTION: ACCURACY: SPEC:FUNCTIONAL DEMON: ± 6% SERVICE: RUN DUE TO MINIMUM LOCATION: OUTSIDE FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL:	Operating Time	4 MONTH	4 MONTH	INRG	INRG	ENGINEERING REVIEW	NONE
	Temperature (°F)	110	200	9.9	MMFTR LIT.	ENGINEERING REVIEW	NONE
	Pressure (PSIA)	14.7	14.7	9.9	MMFTR LIT	ENGINEERING REVIEW	NONE
	Relative Humidity (%)	10°F DRY BULB 76°F WET BULB	WEATHER PROOF CASE	9.9	MMFTR LIT	ENGINEERING REVIEW	NONE
	Chemical Spray	NA	NA				NONE
	Radiation (10 ⁶ rads)	NOTE (M)	NI	NOTE (A)	NOTE (M)	ENGINEERING REVIEW	NONE
	Aging (years)						
	Submergence	NA	NA				NONE

* Documentation References: UNLESS OTHERWISE NOTED ALL
 NOTES: (M) LOCATION OF PRESSURE SWITCH IS OUTSIDE
 ROOM CONTAINING RADIATION SOURCE AND IS
 THEREFORE SHIELDED FROM EFFECT.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: AUXILIARY FEEDWATER PLANT ID NO: FFI 210 220 230 & 240 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: FOXBORO MODEL NUMBER: 1-E13DM-H-I-mt-D FUNCTION: MONITORING ACCURACY: SPEC: 525 % DEMON: NOTE (L) SERVICE: AUXILIARY FEEDWATER FLOW LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time	4 MONTHS	NOTE (L)	14.2.8	NOTE (L)	NOTE (L)	NONE
	Temperature (°F)	230		FIG 0.27			NONE
	Pressure (PSIA)	26.2		FIG 0.27			NONE
	Relative Humidity (%)	100	X	7.5	X	X	NONE
	Chemical Spray	NA	NA	NA	NA	NA	NONE
	Radiation (10 ⁶ rads)	NA	NA	NA	NA	NA	NONE
	Aging (years)						
	Submergence	NA	NA	NA	NA	NA	NONE

*Documentation References: UNLESS OTHERWISE NOTED
 ALL REFERENCES ARE PSAR SECTIONS.

Notes: (L) PRESENTLY INSTALLED DEVICES ARE
 PART OF THE QUALIFICATION TEST PROGRAM FOR
 UTILITY TRANSMITTER QUALIFICATION GROUP BEING
 PERFORMED TO MEET THE REQUIREMENTS
 ON NUREG 0578 ITEM 2.1.7.b. SEE HFP:

NRC: 00253 DATED OCT. 24 1979.

THESE DEVICES ARE NOT EXPOSED TO
 LOCAL LONG TERM RESIDUAL RADIATION
 EXPOSURE DOSES.

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 TEST COMPLETION IS ANTICIPATED IN JUNE
 1982.

AEP: NRC: 00578



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING	Operating Time	< 60 MIN	90 MIN	TABLE 7.5-2	WCNP 8541	SEPARATE EFFECTS	NONE
PLANT ID NO: I FI 51, 52, 53 & 54	Temperature (°F)	250	790	NO. 3.1-31 FIG NB.13-1	WCNP 8541	SEQUENTIAL	NONE
COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER	Pressure (PSIA)	28.8	74.7	N13.2	WCNP 8541	SEQUENTIAL	NONE
MANUFACTURER: FOXBORO	Relative Humidity (%)	100	100	7.5	WCNP 8541	SEQUENTIAL	NONE
MODEL NUMBER: E120H-USAHI MCR	Chemical Spray	1.14% BORIC ACID & 15% MECH 8.4	1.5% BORIC ACID @ 725 TO 1000 HIGH	N 5.3.6	WCNP 8541	SEQUENTIAL	NONE
FUNCTION: MONITORING	Radiation (10 ⁶ rads)	3.9	76	WCNP 7410-L Vol. I	WCNP 8541	SEPARATE EFFECTS	NONE
ACCURACY: SPEC: FUNCTIONING DEMON: ± 6%	Aging (years)						
SERVICE: BORON INJECTION TANK CLADDING FLAT	Submergence	11'-6"	60 PSIG	BRWG 5570B C.D.E.	ENGEG 196MT	ENGINEERING REVIEW	NONE
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO							

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FOR SECTIONS
 AEW-8541 WESTINGHOUSE ELECTRIC CORP
 TOPICAL REPORT FOR ENVIRONMENTAL
 TESTING OF FOXBORO TRANSMITTERS

Notes: NO SPECIFIC ACCIDENT ANALYSIS TAKES CREDIT FOR ASSUMED OPERATION OF THESE DEVICES. THEIR USE IS REFERENCED BY EMERGENCY OPERATING PROCEDURES.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING PLANT ID NO: ISI 51, 52, 53 & 54 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: WESTINGHOUSE MODEL: 45741 MCB FUNCTION: LONG TERM MONITORING ACCURACY: SPEC: FUNCTIONAL DEMON: $\pm 6\%$ SERVICE: BORON INJECTION TANK DISCHARGE FLOW LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO	Operating Time	460 MIN	90 MIN	TABLE 7.5-1	WCBP 8541	SEPARATE EFFECTS	NONE
	Temperature (°F)	160	790	FIG N 13.13-2	WCBP 8541	SEQUENTIAL	NONE
	Pressure (PSIA)	26.2	74.7	FIG N 5.3-11	WCBP 8541	SEQUENTIAL	NONE
	Relative Humidity (%)	100	100	7.5	WCBP 8541	SEQUENTIAL	NONE
	Chemical Spray	1.14% BORIC ACID & 1.5% NaOH	1.5% BORIC ACID & 1.5% NaOH	N 5.3.6	WCBP 8541	SEQUENTIAL	NONE
	Radiation (10 ⁶ rads)	40	76	REF 30	WCBP 8541	SEPARATE EFFECTS	NONE
	Aging (years)						
	Submergence	11'-6"	60 PSIG	DRWG 55766 C. USE	ENGGR ASMT	ENGINEERING LEVW	NONE

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS
 AEW-8541 WESTINGHOUSE ELECTRIC CORP
 TOPICAL REPORT FOR ENVIRONMENTAL
 TESTING OF FOXBORO TRANSMITTERS

Notes: NO SPECIFIC ACCIDENT ANALYSIS TAKES CREDIT FOR ASSUMED OPERATION OF THESE DEVICES. THEIR USE IS REFERENCED BY EMERGENCY OPERATING PROCEDURES.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING	Operating Time	4 60 MIN	90 MIN	TABLE 7.5-2	WCHP 8541	SEPARATE EFFECTS	NONE
PLANT ID NO: IFI 51, 52, 53 & 54	Temperature (°F)	233 330	290	N13.7 N13.6	WCHP 8541	SEQUENTIAL	NONE
COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER	Pressure (PSIA)	35.5	74.7	N13.8	WCHP 8541	SEQUENTIAL	NONE
MANUFACTURER: FOXBORO	Relative Humidity (%)	100	100	7.5	WCHP 8541	SEQUENTIAL	NONE
MODEL NUMBER: E13CH-HSANN-MED	Chemical Spray	1.14% BOKIC ACIDE 15% N100H 8.4	1.5% BOKIC ACIDE 12.5% 100H N100H	N 5.3.6	WCHP 8541	SEQUENTIAL	NONE
FUNCTION: MONITORING	Radiation (10 ⁶ rads)	.6	76	REF 30	WCHP 8541	SEPARATE EFFECTS	NONE
ACCURACY: SPEC: FUNCTIONAL DEMON: ± 6%	Aging (years)						
SERVICE: BOKIN INJECTION TANK DISCHARGE FLOW	Submergence	11'-6"	60 PSIG	DRWG 5708 C.D.E.	ENGRG JGUNT	ENGINEERING REVIEW	NONE
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO							

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FOR SECTIONS
AEW-8541 WESTINGHOUSE ELECTRIC CORP
TOPICAL REPORT FOR ENVIRONMENTAL
TESTING OF FOXBORO TRANSMITTERS

Notes: NO SPECIFIC ACCIDENT ANALYSIS TAKES CREDIT FOR ASSUMED OPERATION OF THESE DEVICES. THEIR USE IS REFERENCED BY EMERGENCY OPERATING PROCEDURES. INDICATIONS FROM OTHER, DIVERSE INSTRUMENTS CAN SERVE OR CORROBORATE THE INTENDED FUNCTION.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING PLANT ID NO: ISI 51.52 53 & 54 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: WESTINGHOUSE ELECTRIC CORP FUNCTION: LONG TERM MONITORING ACCURACY: SPEC: FUNCTIONAL DEMON: $\pm 10\%$ SERVICE: BORON INJECTION TANK DISCHARGE FLOW LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO	Operating Time	460 MIN	90 MIN	TABLE 7.5-1	WCNP 8541	SEPARATE EFFECTS	NONE
	Temperature ($^{\circ}$ F)	160	790	FIG N 13.13-2	WCNP 8541	SEQUENTIAL	NONE
	Pressure (PSIA)	26.2	74.7	FIG N 5.3-11	WCNP 8541	SEQUENTIAL	NONE
	Relative Humidity (%)	100	100	7.5	WCNP 8541	SEQUENTIAL	NONE
	Chemical Spray	1.14% BORIC ACID & 1.15% PH 8.4	1.5% BORIC ACID & 1.25% PH 10 PH HIGH	N 5.3.6	WCNP 8541	SEQUENTIAL	NONE
	Radiation (10^6 rads)	40	76	REF 30	WCNP 8541	SEPARATE EFFECTS	NONE
	Aging (years)						
	Submergence	11'-6"	60 PSIG	DRWG 55706 C. USE	ENGEG ASUMT	ENGINEERING REVIEW	NONE

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS
 AEW-8541 WESTINGHOUSE ELECTRIC CORP
 TOPICAL REPORT FOR ENVIRONMENTAL
 TESTING OF FOXBORO TRANSMITTERS

Notes: NO SPECIFIC ACCIDENT ANALYSIS TAKES CREDIT FOR ASSUMED OPERATION OF THESE DEVICES. THEIR USE IS REFERENCED BY EMERGENCY OPERATING PROCEDURES.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING	Operating Time	< 60 MIN	90 MIN	TABLE 7.5-2	WCHP 8541	SEPARATE EFFECTS	NONE
PLANT ID NO: IFI 51, 52, 53 & 54	Temperature (°F)	233 330	290	N13.7 N13.6	WCHP 8541	SEQUENTIAL	NONE
COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER	Pressure (PSIA)	35.5	74.7	N13.8	WCHP 8541	SEQUENTIAL	NONE
MANUFACTURER: FOXBORO	Relative Humidity (%)	100	100	7.5	WCHP 8541	SEQUENTIAL	NONE
MODEL NUMBER: E13 CH-HSAH-MCD	Chemical Spray	1.1% BORIC ACID & 15% NH4OH	1.5% BORIC ACID & 12.5% NH4OH	N 53.6	WCHP 8541	SEQUENTIAL	NONE
FUNCTION: MONITORING	Radiation (10 ⁶ rads)	.6	76	REF 30	WCHP 8541	SEPARATE EFFECTS	NONE
ACCURACY: SPEC: FUNCTIONAL DEMON: ± 6%	Aging (years)						
SERVICE: BORON INJECTION TANK DISCHARGE FLOW	Submergence	11'-6"	60 PSIG	DRWG 5570B C.D.E.	ENGRG ASGHT	ENGINEERING REVIEW	NONE
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO							

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FEAR SECTIONS
 AEW-8541 WESTINGHOUSE ELECTRIC CORP
 TOPICAL REPORT FOR ENVIRONMENTAL
 TESTING OF FOXBORO TRANSMITTERS

Notes: NO SPECIFIC ACCIDENT ANALYSIS TAKES CREDIT FOR ASSUMED OPERATION OF THESE DEVICES. THEIR USE IS REFERENCED BY EMERGENCY OPERATING PROCEDURES. INDICATIONS FROM OTHER, DIVERSE INSTRUMENTS CAN SERVE OR CORROBORATE THE INTENDED FUNCTION.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY OF COOLING PLANT ID NO: IFI-260 & 266 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: IIT EARTON MODEL NUMBER: 332 FUNCTION: MONITORING ACCURACY: SPEC: FUNCTIONAL DEMON: FUNCTIONAL SERVICE: SIS PUMP DRAINAGE FLOW LOCATION: OUTSIDE PLANT UNIT FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A	Operating Time	4 MONTH	4 MONTH	EMRGY PROCS	ENGRG JOGMT	ENG'G REVIEW	NONE
	Temperature (°F)	110	160	9.9	MANFTR LIT.	ENG'G REVIEW	NONE
	Pressure (PSIA)	14.7	14.7	9.9	MANFTR LIT.	ENG'G REVIEW	NONE
	Relative Humidity (%)	90°F DRY BULB 76°F WET BULB	99+	9.9	MANFTR LIT.	ENG'G REVIEW	NONE
	Chemical Spray	NA	NA				NONE
	Radiation (10 ⁶ rads)	NA(M)	NA (M)	NA (M)	NOTE (M)	ENG'G REVIEW	NONE
	Aging (years)						
	Submergence	NA	NA				NONE

*Documentation References:

 ALL REFS ARE TO FSAR SECTIONS
 UNLESS OTHERWISE NOTED

 Notes: (M) TRANSMITTER IS LOCATED OUTSIDE
 ROOM CONTAINING RADIATION SOURCE
 & IS THUS SHIELDED FROM EFFECT.

 MANFTR LIT: IIT EARTON PRODUCT/BULLETIN
 G1-23-3



*Documentation References: UNLESS OTHERWISE NOTED IN THE
1. REFERENCES ARE FOR THE PSAR SECTIONS.
2. FOR THE FOXBORO GENERAL SPECIFICATION GS-2A-1C1E
Notes: (1) LOCATION OF TRANSMITTER IS OUTSIDE
ROOM FOR WHICH RADIATION SOURCE IS GENERATED
THEREFORE SHIELDED FROM EFFECT

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING PLANT ID NO: IFI-260 & 266 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: JET KANTON MODEL NUMBER: 332 FUNCTION: MONITORING ACCURACY: SPEC: FUNCTIONAL DEMON: FUNCTIONAL SERVICE: SIS PUMP DISCHARGE FLOW LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A	Operating Time	4 MONTHS	4 MONTHS	EMRGY PROCS	ENGRG JOGMT	ENG'G REVIEW	NONE
	Temperature (°F)	110	160	9.9	MNFTR LIT.	ENG'G REVIEW	NONE
	Pressure (PSIA)	14.7	14.7	9.9	MNFTR LIT.	ENG'G REVIEW	NONE
	Relative Humidity (%)	90°F DRY BULB 76°F WET BULB	99+%	9.9	MNFTR LIT.	ENG'G REVIEW	NONE
	Chemical Spray	NA	NA				NONE
	Radiation (10 ⁶ rads)	NA(M)	NA (M)	NA (M)	NOTE (M)	ENG'G REVIEW	NONE
	Aging (years)						
	Submergence	NA	NA				NONE

*Documentation References:

ALL REFS ARE TO FSAR SECTIONS
 UNLESS OTHERWISE NOTED

Notes: (M) TRANSMITTER IS LOCATED OUTSIDE
 ROOM CONTAINING RADIATION SOURCE
 & IS THUS SHIELDED FROM EFFECT.

MNFTR LIT: JET KANTON PRODUCT/BULLETIN
 G1-23-3



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING PLANT ID NO: IFC 311 E 321 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: ITT BARTON MODEL NUMBER: 332 FUNCTION: MONITORING ACCURACY: SPEC: FUNCTIONAL DEMON: FUNCTIONAL SERVICE: KHE FLOW : : EXCHANGER OUTLET LOCATION: OUTSIDE : : PLANTMENT FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A	Operating Time	4 MONTH	4 MONTH	EMER PROC.	FFRAG JDMT	ENGINEERING REVIEW	NONE
	Temperature (°F)	110	160	9.9	MNFTR LIT.	ENGINEERING REVIEW	NONE
	Pressure (PSIA)	14.7	14.7	9.9	MNFTR LIT.	ENGINEERING REVIEW	NONE
	Relative Humidity (%)	10°F DRY BULB 76°F WET BULB	99+	9.9	MNFTR LIT.	ENGINEERING REVIEW	NONE
	Chemical Spray	NA	NA				NONE
	Radiation (10 ⁶ rads)	NA (M)	NA (LM)	NA	NOTE LM)	ENGINEERING REVIEW	NONE
	Aging (years)						
	Submergence	NA	NA				NONE

*Documentation References: ALL REFERENCES ARE PSAR
 UNLESS OTHERWISE NOTED
 MINOR LIT. ITT BARTON PRODUCT/BULLETIN
 61-23-3

Notes: (LM) LOCATION OF TRANSMITTER IS OUTSIDE
 ROOM FOR WHICH RADIATION SOURCE IS GENERATED
 THEREFORE SHIELDED FROM EFFECT.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING PLANT ID NO: I.F.I 310 & 320 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: FOXBORO MODEL NUMBER: E13DM-HSAM1 FUNCTION: MONITORING ACCURACY: SPEC: FUNCTIONAL DEMON: 1 1/2 % SERVICE: RHR FLOW HEAT EXCHANGER OUTLET LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL:	Operating Time	4 MONTHS	4 MONTHS	ENRKY PROCS	MNFTK LIT & VIA P85-91	SEPARATE EFFECTS & ENGINEERING REVIEW	NONE
	Temperature (°F)	110	180	9.9	MNFTK LIT	ENGINEERING REVIEW	NONE
	Pressure (PSIA)	14.7	14.7	9.9	MNFTK LIT	ENGINEERING REVIEW	NONE
	Relative Humidity (%)	90°F DRY BULB 76°F WET BULB	NEMA 4 WATER TIGHT	9.9	MNFTK LIT	ENGINEERING REVIEW	NONE
	Chemical Spray	NA	NA				NONE
	Radiation (10 ⁶ rads)	NA (M)	NA (M)	NA (M)	NOTE (M)	ENGINEERING REVIEW	NONE
	Aging (years)						
	Submergence	NA	NA				NONE

*Documentation References: UNLESS OTHERWISE NOTED ALL
REFERENCES ARE PSAR SECTIONS.

Notes: (M) LOCATION OF TRANSMITTER IS OUTSIDE
ROOM FOR WHICH RADIATION SOURCE IS GENERATED
MNFTR-LIT - FOXBORO GENERAL SPECIFICATION THEREFORE SHIELDED FROM EFFECT

GS-2A-1C1E

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST A PLANT ID NO: MFC-110, 111, 120, 121, 130, 131, 140 & 141 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: IIT BAKTON MODEL NUMBER: 764 FUNCTION: ACTUATION & NORMAL MONITORING ACCURACY: SPEC: -10% DEMON: +5% SERVICE: MAIN STEAM FLOW LOCATION: IN CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO	Operating Time	5 SEC	2 3 sec / 10 MIN	N 13.7	REF 30	RESPONSE TIME TEST SEQUENTIAL	NONE
	Temperature (°F)	233 330	360 & 250	N13.7 N13.6	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Pressure (PSIA)	35.5	8.17 & 14.7	N13.8	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL	NONE
	Chemical Spray	1.14% BORIC ACID & .15% NaOH pH 8.4	1.14% BORIC ACID & .17% NaOH pH 8.5	N 5.3.6	REF 30	SEQUENTIAL	NONE
	Radiation (10 ⁶ rads)	.04	50 @ 2.5 / HR	REF 30	REF 30	COMBINED EFFECTS	NONE
	Aging (years)						
	Submergence	18 ft	75 PSIG	DRWG 5570D	ENGR JDGMT	ENGINEERING REVIEW	NONE

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS.
 30 - WESTINGHOUSE ELECTRIC CORP.
 COMMUNICATION NS-TMA-1950.

Notes: ADVERSE ENVIRONMENT GENERATING ACCIDENT ANALYSIS FOR WHICH CREDIT IS ASSUMED FOR OPERATION OF THESE DEVICES IS 14.2.5



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: EMERGENCY CORE COOLING PLANT ID NO: IFI 311 & 321 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: ITT BARTON MODEL NUMBER: 332 FUNCTION: MONITORING ACCURACY: SPEC: FUNCTIONAL DEMON: FUNCTIONAL SERVICE: KHK FLOW HEAT EXCHANGER OUTLET LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A	Operating Time	4 MONTHS	4 MONTHS	EMRGY PROC.	ENGRG JDMT	ENGINEERING REVIEW	NONE
	Temperature (°F)	110	160	9.9	MNFR LIT.	ENGINEERING REVIEW	NONE
	Pressure (PSIA)	14.7	14.7	9.9	MNFR LIT.	ENGINEERING REVIEW	NONE
	Relative Humidity (%)	90°F DRY BULB 76°F WET BULB	99+	9.9	MNFR LIT.	ENGINEERING REVIEW	NONE
	Chemical Spray	NA	NA				NONE
	Radiation (10 ⁶ rads)	NA (M)	NA (M)	NA	NOTE (M)	ENGINEERING REVIEW	NONE
	Aging (years)						
	Submergence	NA	NA				NONE

*Documentation References: ALL REFERENCES ARE FOR SECTIONS UNLESS OTHERWISE NOTED
 MNFR LIT. ITT BARTON PRODUCT/BULLETIN
 61-23-3

Notes: (M) LOCATION OF TRANSMITTER IS OUTSIDE ROOM FOR WHICH RADIATION SOURCE IS GENERATED THEREFORE SHIELDED FROM EFFECT.



NOT APPLICABLE

Holes:

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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST B PLANT ID NO: MPP 210, 211 212, 221, 230, 231, 240 211 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: FAY BORO MODEL NUMBER: 11-11-11-11 (MCA) FUNCTION: POST ACCIDENT INJECTION & ACTIVATION ACCURACY: SPEC: +10% DEMON: -10.5% SERVICE: MAIN STEAM PRESSURE LOCATION: OUTSIDE PLANT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time	5 sec 4 MONTHS	< 3 sec 4 MONTHS	N13.7-1	PLC-5023 100% TEST	RESPONSE TIME TEST SEQUENTIAL	NONE
	Temperature (°F)	230	318	FIG. 0-27	NS-PLC-5023	SEQUENTIAL	NONE
	Pressure (PSIA)	26.2	90	FIG. 0-27	NS-PLC-5023	SEQUENTIAL	NONE
	Relative Humidity (%)	100	100	7.5	NS-PLC-5023	SEQUENTIAL	NONE
	Chemical Spray	NONE	NONE	N/A	N/A	N/A	NONE
	Radiation (10 ⁶ rads)	N/A	50	N/A	NS-PLC-5023	SEPARATE EFFECTS	NONE
	Aging (years)						
	Submergence	N/A	N/A				

*Documentation References: UNLESS OTHERWISE NOTED
ALL REFERENCES ARE TO FSAR SECTIONS

Notes: ADVERSE ENVIRONMENT GENERATING ACCIDENT
ANALYSIS FOR WHICH CREDIT IS ASSUMED FOR
OPERATION OF THESE DEVICES IS 14.2.5

N 11-11-11-11 WESTINGHOUSE ELECTRIC CORP.
CORRESPONDENCE WITH AS NOTED
IDENTITY.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MAIN STEAM & REACTOR TRIP DETECTION PLANT ID NO: MPC 253 & 254 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: FOXBORO MODEL NUMBER: E11GM-HSND1 FUNCTION: NORMAL MONITOR & DETECTION ACCURACY: SPEC: DEMON: SERVICE: FIRST STAGE TURBINE PRESSURE LOCATION: OUTSIDE CONFINEMENT FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:

THESE DEVICES WERE INCLUDED IN THE FIRST SUBMITTAL OF IEB 79-01B TO ACCOUNT FOR DEVICES REFERENCED BY 14.2.5 ACCIDENT ANALYSIS. THESE DEVICES ARE NOT REQUIRED EQUIPMENT DUE TO THE 4022.16 EXCLUSION OF THE NEUTRON DETECTORS. THE DETECTORS AND THESE DEVICES FORMED A COINCIDENCE LOGIC FOR REACTOR TRIP. THEREFORE, EXCLUSION OF THE DETECTORS CAUSES EXCLUSION OF THESE DEVICES.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST C PLANT ID NO: MPP-212, 222, 242 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: FOXBORO MODEL NUMBER: 11-11-HSAE1 FUNCTION: POST ACCIDENT MONITOR & ACTION ACCURACY: SPEC: +10% DEMON: ± 2.5% SERVICE: MAIN STEAM PRESSURE LOCATION: OUTSIDE PLANT FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: N/A	Operating Time	5 SEC 4 MONTH	4.3 SEC 4 MONTH	N13.7	FIG. 0-27 MINF. LIT.	RESPONSE TIME TEST ENGINEERING REVIEW	NONE
	Temperature (°F)	230	180	FIG. 0-27	MINF. LIT.	ENGINEERING REVIEW	NONE
	Pressure (PSIA)	26.2	14.7	FIG. 0-27	NONE	ENGINEERING REVIEW	NONE
	Relative Humidity (%)	100	HEAVY WATER-TIGHT	7.5	MINF. LIT.	ENGINEERING REVIEW	NONE
	Chemical Spray	NONE	NONE	N/A	N/A	N/A	NONE
	Radiation (10 ⁶ rads)	N/A	N/A	N/A	N/A	N/A	NONE
	Aging (years)						
	Submergence	N/A	N/A				

*Documentation References: UNLESS OTHERWISE NOTED
 IN DIFFERENCES ARE TO FOUR SECTIONS.
 FIG. 0-27 FOXBORO PRODUCT SPECIFICATION
 PSS 70-113A

Notes: THE ARRANGEMENT OF THE DIFFERENTIAL
 PRESSURE BETWEEN STEAMLINES LOGIC IS SUCH
 THAT FAILURE OF THESE DEVICES COUPLED WITH
 A SINGLE FAILURE WILL STILL GENERATE THE
 ACCIDENT IMITATION ASSUMED OPERATION. THERE-
 FORE CONTROL GRADE HARDWARE IS ACCEPTABLE.
 ACCIDENT ANALYSIS SECTION IS 14.2.5.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST B PLANT ID NO: MPP 210, 211 220, 221, 230, 231, 240 & 241 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: FOXBORO MODEL NUMBER: E11GM-115AE1 (11CA1) FUNCTION: POST ACCIDENT NORMAL MONITOR & DETECTION ACCURACY: SPEC: + 10% DEMON: - 12.5% SERVICE: MAIN STEAM PRESSURE LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time	5 sec 4 MONTHS	4.3 sec 4 MONTHS	N13.7-1	TECH SPEC NS 1.37 PLC 5023	RESPONSE TIME TEST SEQUENTIAL	NONE
	Temperature (°F)	230	318	FIG. 0-27	NS-PLC-5023	SEQUENTIAL	NONE
	Pressure (PSIA)	26.2	90	FIG. 0-27	NS-PLC-5023	SEQUENTIAL	NONE
	Relative Humidity (%)	100	100	7.5	NS-PLC-5023	SEQUENTIAL	NONE
	Chemical Spray	NONE	NONE	N/A	N/A	N/A	NONE
	Radiation (10 ⁶ rads)	N/A	50	N/A	NS-PLC-5023	SEPARATE EFFECTS	NONE
	Aging (years)						
	Submergence	N/A	N/A				

*Documentation References: UNLESS OTHERWISE NOTED
ALL REFERENCES ARE TO FSAR SECTIONS

Notes: ADVERSE ENVIRONMENT GENERATING ACCIDENT
ANALYSIS FOR WHICH CREDIT IS ASSUMED FOR
OPERATION OF THESE DEVICES IS 14.2.5

NS-PLC-5023 . WESTINGHOUSE ELECTRIC CORP.
CORRESPONDENCE WITH AS NOTED
IDENTITY.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR MONITORING ACTUATION	Operating Time						
PLANT ID NO: 236	Temperature (°F)						
COMPONENT: 10N CHAMBER	Pressure (PSIA)						
MANUFACTURER: ROCKINGHOUSE	Relative Humidity (%)						
MODEL NUMBER: 23620	Chemical Spray						
FUNCTION: NORMAL MONITORING (D) ACTUATION (D)	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: DEMON:	Aging (years)						
SERVICE: INTERMEDIATE HEATREX FLUX	Submergence						
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL:							

NOT APPLICABLE

*Documentation References:

Notes: (D) ACTUATION REQUIREMENTS ARE FOR NON-REVERSE ENVIRONMENT ACCIDENT ANALYSIS. CREDIT FOR FUNCTION OF DEVICE REFERENCED BY P.1, 14.3.1, 14.2.5 & 14.2.8 ANALYSIS. AS PER Q02.2.16, OPERATION IS NOT ASSUMED IN LOCA OR HCLB ANALYSIS.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST C PLANT ID NO: MPP-212, 222, 232 & 242 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: FOXBORO MODEL NUMBER: E11GM-HSAE1 FUNCTION: POST ACCIDENT & NORMAL MONITOR & ACTUATION ACCURACY: SPEC: +10 % DEMON: ± 2.5 % SERVICE: MAIN STEAM PRESSURE LOCATION: OUTSIDE CONFINEMENT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time	5 SEC 4 MONTH	2.3 SEC 4 MONTH	N13.7	TOTAL SPEC 1.37 MANF. LIT.	RESPONSE TIME TEST ENGINEERING REVIEW	NONE
	Temperature (°F)	230	180	FIG. 0-27	MANFTR LIT.	ENGINEERING REVIEW	NONE
	Pressure (PSIA)	26.2	14.7	FIG 0-27	NONE	ENGINEERING REVIEW	NONE
	Relative Humidity (%)	100	NEMA 4 WATER-TIGHT	7.5	MANFTR LIT.	ENGINEERING REVIEW	NONE
	Chemical Spray	NONE	NONE	N/A	N/A	N/A	NONE
	Radiation (10 ⁶ rads)	N/A	N/A	N/A	N/A	N/A	NONE
	Aging (years)						
	Submergence	N/A	N/A				

*Documentation References: UNLESS OTHERWISE NOTED
 ALL REFERENCES LIKE TO FSAR SECTIONS.
 MANFTR LIT FOXBORO PRODUCT SPECIFICATION
 PSS 711-1153 H

Notes: THE ARRANGEMENT OF THE DIFFERENTIAL PRESSURE BETWEEN STEAMLINES LOGIC IS SUCH THAT FAILURE OF THESE DEVICES COUPLED WITH A SINGLE FAILURE WILL STILL GENERATE THE ACCIDENT INITIATION ASSUMED OPERATION. THEREFORE CONTROL GRADE HARDWARE IS ACCEPTABLE. ACCIDENT ANALYSIS SECTION IS 14.2.5.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR TRIP FUNCTION	Operating Time						
PLANT ID NO: N 411, 412, 420, 421, 430, 431, 440, 441	Temperature (°F)						
COMPONENT: 10N NUMBER	Pressure (PSIA)						
MANUFACTURER: ENGINEERING HOUSE	Relative Humidity (%)						
MODEL NUMBER: 1113686	Chemical Spray						
FUNCTION: IDEAL MONITORING FUNCTION (D)	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: DEMON:	Aging (years)						
SERVICE: POWER RANGE NEUTRON FLUX							
LOCATION: REACTOR CONTAINMENT							
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL:	Submergence						

*Documentation References:

Notes: (D) ACTIVATION REQUIREMENTS ARE FOR
NON-ADVERSE ENVIRONMENT ACCIDENT ANALYSIS.
CREDIT FOR FUNCTION OF DEVICE REFERENCED
BY P.1, 14.3.1, 14.2.5 & 14.2.8 ANALYSIS. AS PER
Q022.16, OPERATION IS NOT ASSUMED
IN LOCA OR HELB ANALYSIS.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: KRB TRIP ACTUATION PLANT ID NO: N 75 & 36 COMPONENT: 10N CHAMBER MANUFACTURER: WESTINGHOUSE MODEL NUMBER: WL 23690 FUNCTION: NORMAL MONITORING & ACTUATION (D) ACCURACY: SPEC: DEMON: SERVICE: INTERMEDIATE RANGE: NEUTRON FLUX LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL:	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

NOT APPLICABLE

*Documentation References:

Notes: (D) ACTUATION REQUIREMENTS ARE FOR NON-ADVERSE ENVIRONMENT ACCIDENT ANALYSIS. CREDIT FOR FUNCTION OF DEVICE REFERENCED BY P1, 14.3.1, 14.2.5 & 14.2.8 ANALYSIS. A 15% CREDIT, OPERATION IS NOT ASSUMED IN LOCA OR HELB ANALYSIS.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST J PLANT ID NO: NLP-151 NLP-152 NLP-153 COMPONENT: DIFFERENTIAL PRESSURE TRANSMITTER MANUFACTURER: ITT BARTON MODEL NUMBER: 764 LONG TERM FUNCTION: POST ACCIDENT & NORMAL MONITORING.* ACCURACY: SPEC: + 25 % DEMON: -5 % SERVICE: MINIMIZE LEVEL LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Operating Time	4 MONTHS	4 MONTHS	(F) Q Q30.1	REF. 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Temperature (°F)	160	160	FIG N 13.13.2	II	II	II
	Pressure (PSIA)	26.2	89.7 & 14.17	FIG N 5.3-II	II	II	II
	Relative Humidity (%)	100	100	7.5	II	II	II
	Chemical Spray	1.11% BOPIC ACID & 0.15% NaOH PH 8.4	1.14% BOPIC ACID & 0.17% NaOH PH 8.55	N 5.3.6	II	SEQUENTIAL	II
	Radiation (10 ⁶ rads)	40	50 AT 2.5 / HR.	Q (B) Q30.1	II	COMBINED EFFECTS	II
	Aging (years)						
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Submergence	NA	NA	DRWG 5581B	NA	NA	NONE

*Documentation References: UNLESS OTHERWISE NOTED
 ALL REFERENCES ARE FSNR SECTIONS.
 REF 30= WESTINGHOUSE ELECTRIC CORP.
 COMMUNICATION NS-TMD-1957

Notes: (B) REQUIREMENT ADDRESSED IN REF. 30
 WHICH WAS SUBMITTED IN RESPONSE TO
 QUESTION Q30.1

*ACTIONION FUNCTION IN 14.2.5 ANALYSIS REMOVED
 PER OUR RESPONSE TO IEB 79-06A WHICH
 REPLACED LEVEL CONTRIBUTION TO ACTIONION
 LOGIC WITH A CONSTANT "TRIP" SIGNAL.



NOT APPLICABLE

Notes: (D) ACTUATION REQUIREMENTS ARE FOR
NON-ADVERSE ENVIRONMENT ACCIDENT ANALYSIS.
CREDIT FOR FUNCTION OF DEVICE REFERENCED
BY P.1, 14.3.1, 14.2.5 & 14.2.8 ANALYSIS. A. P. 1.
14.2.13, OPERATION IS NOT ASSUMED
IN LOCA OR HELB ANALYSIS.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST E	Operating Time	5 SEC E 4 MONTH	23 SEC E 4 MONTH	(2) (U) 030.11 N13.7-1	REF 30 SPEC 3-5 REF 30	RESPONSE TIME TESTING AND SEQUENTIAL	NONE
PLANT ID NO: NPP-151, 152 153	Temperature (°F)	233	360 E 250	N13.7	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)	35.5	89.7 E 14.7	N13.8	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
MANUFACTURER: ITT BAXTON	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
MODEL NUMBER: 763	Chemical Spray	1.14% BORIC ACID + .15% NaOH PH 8.4	1.14% BORIC ACID + .15% NaOH PH 8.5	N5.3.6	REF 30	SEQUENTIAL	NONE
FUNCTION: POST ACCIDENT & NORMAL MONITOR & ACTUATION	Radiation (10 ⁶ rads)	.6	50 E 2.5/HR	WCAP 7410-L VOL I	REF 30	COMBINED EFFECTS	NONE
ACCURACY: SPEC: ±10% DEMON: +14% (A) -5%	Aging (years)						
SERVICE: PRESSURIZER PRESSURE	Submergence	NA	NA	NA	DRWG 55818	NA	NONE
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 614'-0"							
ABOVE FLOOD LEVEL: YES							

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS.

REF. 30 - WESTINGHOUSE ELECTRIC CORP.
CORRESPONDENCE NS-TMA-1950

Notes: (B) REQUIREMENTS ADDRESSED IN REFERENCE 30 WHICH WAS SUBMITTED IN RESPONSE TO THIS QUESTION 030.114.2.5 IS THE ACCIDENT ANALYSIS GENERATING THE ADVERSE ENVIRONMENT IN WHICH CREDIT IS ASSUMED FOR OPERATION OF THESE DEVICES.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST E PLANT ID NO: N14-131, 12.4.5 15.3 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: I T T BARTON MODEL NUMBER: 763 FUNCTION: POST ACCIDENT & NORMAL MONITOR ACTUATION ACCURACY: SPEC: $\pm 10\%$ DEMON: $\pm 14\%$ (A) SERVICE: PRESSURIZER PRESSURE LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Operating Time	3.25 SEC. 37 SEC. 37 SEC. 37 SEC.	± 3.0 SEC 4 MONTH	P.1-5 TABLE P.1-1	REF 30 REF 30	RESPONSE TIME TEST AND SEQUENTIAL	NONE
	Temperature ($^{\circ}$ F)	250	320 & 250	N0.3.1-3E FIG N13.13-1	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Pressure (PSIA)	28.8	89.7 & 14.7	N13.2	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Chemical Spray	1.14% BOKIC ACIDE 1.15% NADH P.H. 8.4	1.14% BOKIC ACIDE 1.17% NADH P.H. 8.5	N5.3.6	REF 30	SEQUENTIAL	NONE
	Radiation (10^6 rads)	.07	50 @ 25/HK	WCRP 74110-L VOL I	REF 30	COMBINED EFFECTS	NONE
	Aging (years)						
	Submergence	NA	NA	NA	DRWG 5581B	NA	NONE

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS.

REF. 30 - WESTINGHOUSE ELECTRIC CORP.
CORRESPONDENCE NS-TMA-1950

Notes: P.1 IS THE ACCIDENT ANALYSIS GENERATING AN ADVERSE ENVIRONMENT IN WHICH CREDIT IS ASSUMED FOR OPERATION OF THESE DEVICES.
(A) FRACTURE MECHANICS ANALYSIS HAS SHOWN THIS VALUE TO BE ACCEPTABLE
REFERENCE AEP : NRC:00192

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST E PLANT ID NO: NPP 151, 152 & 153 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: ITT BARTON MODEL NUMBER: 763 FUNCTION: LONG TERM POST ACCIDENT + NORMAL MONITOR + ACTUATION ACCURACY: SPEC: $\pm 10\%$ DEMON: -5% SERVICE: PRESSURIZER PRESSURE LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Operating Time	4 MONTH	4 MONTH	Q ^(B) 030.1	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Temperature (°F)	160	160	FIG N 13.15-2	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Pressure (PSIA)	26.2	89.7	FIG N 5.3-11	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Chemical Spray	1.14% BORIC ACID + .15% NaOH pH 8.4	1.14% BORIC ACID + .17% NaOH pH 8.55	N5.3.6	REF 30	SEQUENTIAL	NONE
	Radiation (10 ⁶ rads)	40	50 @ 2.5/HR	Q ^(B) 030.1	REF 30	COMBINED EFFECTS	NONE
	Aging (years)						
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Submergence	NA	NA	NA	DRWG 5581B	NA	NONE

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS.

REF. 30 - WESTINGHOUSE ELECTRIC CORP.
CORRESPONDENCE NS-TMA-1950

Notes: (B) REQUIREMENTS APPLICABLE TO THE P.I. P.I. IS THE ACCIDENT ANALYSIS GENERATING AN ADVERSE ENVIRONMENT IN WHICH CREDIT IS ASSUMED FOR OPERATION OF THESE DEVICES.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR COOLANT + POST ACCIDENT MONITOR	Operating Time	4 MONTHS	4 MONTHS	REF 30	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
PLANT ID NO: NPS 121 + 122	Temperature (°F)	233 330	330 ± 320	N13.7 N13.6	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)	35.5	89.7 ± 14.7	N13.8	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
MANUFACTURER: ITT BARTON	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL	NONE
MODEL NUMBER: 763	Chemical Spray	1.14% BORIC ACID + .015% NAOH PH 8.1	1.14% BORIC ACID + .017% NAOH PH 8.5	N 5.3.6	REF 30	SEQUENTIAL	NONE
FUNCTION: MONITORING	Radiation (10 ⁶ rads)	4.6	.76	REF 30	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
ACCURACY: SPEC: ± 10% DEMON: ± 10%	Aging (years)						
SERVICE: REACTOR COOLANT PRESSURE	Submergence	12 FT	75 PSIG	DRWG 55708-C	ENGR JDGMT	ENGINEERING REVIEW	NONE
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO							

*Documentation References: UNLESS OTHERWISE NOTED
ALL REFERENCES ARE FSAR SECTIONS.

REF 30 - WESTINGHOUSE ELECTRIC CORP.
COMMUNICATION NSTMA-1950.

Notes: Q022.8, Q022.16 + Q212.35 ARE THE
ADVERSE ENVIRONMENT GENERATING ACCIDENT
ANALYSIS FOR WHICH CREDIT IS ASSUMED
FOR OPERATION OF THESE DEVICES.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR COOLANT + POST ACCIDENT MONITOR	Operating Time	4 MONTHS	4 MONTHS	REF 30	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
PLANT ID NO: NPS 121 & 122	Temperature (°F)	250 & 160	280	F16SN 13.13-1 & -2	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)	28.8 & 26.2	89.7 & 14.7	N13.2 & F16 N5.3-II	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
MANUFACTURER: ITT BARTON	Relative Humidity (%)	100	100	7.5	REF 30	SEQUENTIAL	NONE
MODEL NUMBER: 763	Chemical Spray	1.14% BORIC ACID + .015% NaOH ^{PH} R-1	1.14% BORIC ACID + .017% NaOH ^{PH} R-1	N 5.3.6	REF 30	SEQUENTIAL	NONE
FUNCTION: LONG TERM MONITORING	Radiation (10 ⁶ rads)	40	50	REF 30	REF 30	SEQUENTIAL + COMBINED EFFECTS	NONE
ACCURACY: SPEC: ±10% DEMON: ±10%	Aging (years)						
SERVICE: REACTOR COOLANT PRESSURE	Submergence	12 FT	75 PSIG	DRWG 55708-10	ENGR JUGMT	ENGINEERING REVIEW	NONE
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: NO							

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS.

Notes: Q022.8, Q022.16 + Q212.35 ARE THE ADVERSE ENVIRONMENT GENERATING ACCIDENT ANALYSIS FOR WHICH CREDIT IS ASSUMED FOR OPERATION OF THESE DEVICES.

REF 30 - WESTINGHOUSE ELECTRIC CORP.
COMMUNICATION NS-TMA-1950.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: ELECTRIC CONTROL PLANT ID NO: NPS 153 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: ITT CARTON MODEL NUMBER: 763 FUNCTION: LONG TERM MONITORING ACCURACY: SPEC: $\pm 10\%$ DEMON: -5% SERVICE: PRESSURIZED PRESSURE LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Operating Time	4 MONTH	4 MONTH	Q030.1 NRC	REF. 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Temperature (°F)	160	160	FIG. 14.3.1	REF. 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Pressure (PSIA)	27.2	89.7	ACW G504	REF. 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Relative Humidity (%)	100	100 & 0	7.5	REF. 30	SEQUENTIAL	NONE
	Chemical Spray	1.14% boric ACID & .15% NITROGEN PHOSPH.	1.14% boric ACID & .17% NITROGEN PHOSPH.	N 5.3.6	REF. 30	SEQUENTIAL	NONE
	Radiation (10 ⁶ rads)	40	50 @ 2.5/Hr	Q030.1 NRC	REF. 30	COMBINED EFFECTS	NONE
	Aging (years)						
	Submergence	NA	NA	DRWG 5581B	ENGRS REVIEW	ENGINEERING REVIEW	NONE

*Documentation References:

UNLESS OTHERWISE NOTED, ALL
 REFERENCES ARE TO FSAR SECTIONS.

FIG. 10: WESTINGHOUSE ELECTRIC CORP.
 CORRESPONDENCE NS-TMA-1950.

Notes: REQUIREMENT & QUALIFICATIONS SHOWN AS
 MONITORING PHASE REQUIREMENTS AND QUALI-
 FICATIONS OF NPP-151, 152 & 153 DEVICES.

(B) REQUIREMENTS ADDRESSED IN REF. 30
 WHICH WAS SUBMITTED IN RESPONSE
 TO FSAR QUESTION Q030.1.
 14.3.1 IS THE ACCIDENT ANALYSIS.
 Page 124

REP:NRC:00578



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST D	Operating Time	3.4 SEC. LOCK 32 SEC. SLACK	4.5 SEC. 2 WEEKS	P.1-5 & TABLE P.1-1	TECH SPEC 1.3 REF 28	RESPONSE TIME TEST SEQUENTIAL	NONE
PLANT ID NO: NTP-III, 121, 131, 141, 211, 221, 231 & 241	Temperature (°F)	250	320	N03.1- 3.8 FIG N13.13-1	REF 28	SEQUENTIAL	NONE
COMPONENT: RESISTANCE TEMPERATURE DETECTOR	Pressure (PSIA)	28.8	89.7	N13.2	REF 28	SEQUENTIAL	NONE
MANUFACTURER: SOSTMAN OR ROSEMOUNT	Relative Humidity (%)	100	100	7.5	REF 28	SEQUENTIAL	NONE
MODEL NUMBER: 118348 OR 176 KF RESPECTIVELY	Chemical Spray	1.14% BORIC ACID & .15% NAOH PH 8.4	1.14% BORIC ACID & .15% NAOH PH 8.4	N5.3.6	REF 28	SEQUENTIAL	NONE
FUNCTION: ACTUATION & NORMAL MONITOR	Radiation (10 ⁶ rads)	.07	100	WCNP 7410-L VOL I	REF 28	SEQUENTIAL	NONE
ACCURACY: SPEC: ± 7.3 % DEMON: ± 2.29 %	Aging (years)						
SERVICE: REACTOR COOLANT TEMPERATURE	Submergence	NA	NA	NA	DRWG 5507		
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES							

*Documentation References: UNLESS OTHERWISE NOTED
ALL REFERENCES ARE TO THE SECTIONS.

Notes: ADVERSE ENVIRONMENT GENERATING ACCIDENT
ANALYSIS FOR WHICH CREDIT IS ASSUMED FOR
OPERATION OF THESE DEVICES IS P.1.

28 - WESTINGHOUSE ELECTRIC CO. INC.
ENVIRONMENTAL CONTROLS DIV.
WCNP-5157.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR COOLANT & REMOTE SHUTDOWN MONITORING PLANT ID NO: NPS 153 COMPONENT: PRESSURE TRANSMITTER MANUFACTURER: I. T. BURTON MODEL NUMBER: 743 FUNCTION: LONG TERM MONITORING ACCURACY: SPEC: $\pm 10\%$ DEMON: $\sim 5\%$ SERVICE: PRESSURIZER PRESSURE LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Operating Time	4 MONTH	4 MONTH	Q030.1 NOTE(B)	REF. 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Temperature (°F)	160	160	FIG. 14.3.42	REF. 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Pressure (PSIA)	27.2	89.7	ACW 6504	REF. 30	SEQUENTIAL & COMBINED EFFECTS	NONE
	Relative Humidity (%)	100	100 & 0	7.5	REF. 30	SEQUENTIAL	NONE
	Chemical Spray	1.14% boric acid & .015% NaOH pH 8.7	1.14% boric acid & .017% NaOH pH 8.55	N 5.3.6	REF. 30	SEQUENTIAL	NONE
	Radiation (10 ⁶ rads)	40	50 @ 2.5/HR	Q030.1 NOTE(B)	REF. 30	COMBINED EFFECTS	NONE
	Aging (years)						
	Submergence	NA	NA	DRNG 5581B	ENGRG REVIEW	ENGINEERING REVIEW	NONE

*Documentation References:

UNLESS OTHERWISE NOTED, ALL
 REFS ARE TO FSAR SECTIONS.

REF 30: WESTINGHOUSE ELECTRIC CORP.
 CORRESPONDENCE NS-TIA-1930.

Notes: REQUIREMENT EQUIVIFICATIONS SAME AS
 MONITORING PHASE REQUIREMENTS AND EQUIV-
 IFICATIONS OF NPP-151, 152 & 153 DEVICES.

(B) REQUIREMENTS ADDRESSED IN REF. 30
 WHICH WAS SUBMITTED IN RESPONSE
 TO FSAR QUESTION Q030.1.
 14.3.1 IS THE ACCIDENT ANALYSIS.
 Page 115

REF: NRC: 00578

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST D	Operating Time	10 SEC	45 SEC 2 WEEKS	N13.7	REF 28 SPEC 3.3	RESPONSE TIME TEST SEQUENTIAL	NONE
PLANT ID NO: NTP-III, 121, 121, 141, 211, 211, 211, 211	Temperature (°F)	233 330	330	N13.7 N13.6	REF 28	SEQUENTIAL	NONE
COMPONENT: RESISTANCE TEMPERATURE DETECTOR MANUFACTURER: SOSTMAN OR ROSEMOUNT	Pressure (PSIA)	15.5	89.7	N13.7	REF 28	SEQUENTIAL	NONE
MODEL NUMBER: 11834B OR 176 KF RESPECTIVELY	Relative Humidity (%)	100	100	7.5	REF 28	SEQUENTIAL	NONE
FUNCTION: ACTUATION & NORMAL MONITOR	Chemical Spray	1.14% BORIC ACID ±.15% NaOH pH 8.4	1.14% BORIC ACID ±.15% NaOH pH 8.4	N5.3.6	REF 28	SEQUENTIAL	NONE
ACCURACY: SPEC: ±7.3% DEMON: -2.29%	Radiation (10 ⁶ rads)	.04	100	WCAP 7410-L VOL I	REF 28	SEQUENTIAL	NONE
SERVICE: REACTOR COOLANT TEMPERATURE	Aging (years)						
LOCATION: INSIDE CONTAINMENT	Submergence	NA	NA	NA	DRWG 5507		
FLOOD LEVEL ELEV: 614'-0"							
ABOVE FLOOD LEVEL: YES							

*Documentation References: UNLESS OTHERWISE NOTED
ALL REFERENCES ARE FSAR SECTIONS.

28 - WESTINGHOUSE ELECTRIC CORP.
ENVIRONMENTAL QUALIFICATIONS
WCAP - 9157.

Notes: ADVERSE ENVIRONMENT GENERATING ACCIDENT
ANALYSIS FOR WHICH CREDIT IS PLACED FOR
OPERATION OF THE UNIT IS N13.7.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR SYSTEM	Operating Time						
PLANT ID NO: NTP 110 120 1 110 210 220 230 E	Temperature (°F)						
COMPONENT: RESISTANCE MANUFACTURER:	Pressure (PSIA)						
MODEL NUMBER: 11834B OF 1 EACH RESPECTIVELY	Relative Humidity (%)						
FUNCTION: 11 PLACE SPARES	Chemical Spray						
ACCURACY: SPEC: N H DEMON:	Radiation (10 ⁶ rads)						
SERVICE: REACTOR COOLING TEMPERATURE	Aging (years)						
LOCATION: INSIDE COMPONENT	Submergence						
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL:							

*Documentation References:

Notes: REQUIREMENTS AND QUALIFICATION FOR
THESE DEVICES IDENTICAL TO NTP-III ETC.
REQUIREMENTS AND QUALIFICATIONS

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR COOLANT	Operating Time						
PLANT ID NO: NTP 110 120 130 140 210 220 230 & 240	Temperature (°F)						
COMPONENT: RESISTANCE TEMPERATURE DETECTOR	Pressure (PSIA)						
MANUFACTURER: COSTMAN OR ROSEMOUNT	Relative Humidity (%)						
MODEL NUMBER: 11834B OR 176KF RESPECTIVELY	Chemical Spray						
FUNCTION: IN PLACE SPARES	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: N/A DEMON:	Aging (years)						
SERVICE: REACTOR COOLANT TEMPERATURE	Submergence						
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV:							
ABOVE FLOOD LEVEL:							

SEE NTP-III, 121, 131, 141, 211, 221, 231 & 241 SHEETS

*Documentation References:

Notes: REQUIREMENTS AND QUALIFICATION FOR THESE DEVICES IDENTICAL TO NTP-III ETC. REQUIREMENTS AND QUALIFICATIONS



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR COOLANT POST ACCIDENT MONITORING	Operating Time	4 MONTHS	4 MONTHS	NOTE (E)	REF. 28	SEQUENTIAL, COMBINED EFFECTS & ENGINEERING ANALYSIS	NONE
PLANT ID NO: NTR 110, 120, 130, 140, 210, 220, 230 & 240	Temperature (°F)	160 & 233/330	160 & 330	FIG N 13.13-2 EN13.7/13.6	II	SEQUENTIAL	II
COMPONENT: RESISTANCE HEAT EXCHANGER DETECTOR	Pressure (PSIA)	26.2 & 35.5	89.7	FIG N 5.3-11 EN13.8	II	II	II
MANUFACTURER: SOSTONIAN & ROSENKRANTZ	Relative Humidity (%)	100	100	7.5	II	II	II
MODEL NUMBER: 11901B OR 174KS, RESPECTIVELY	Chemical Spray	1.14% BORIC ACID & .15% NaOH pH 8.4	1.14% BORIC ACID & .17% NaOH pH 8.55	N 5.3.6	II	II	II
FUNCTION: NOMINAL & ACCIDENT MONITORING	Radiation (10 ⁶ rads)	40	100	NOTE (E)	II	COMBINED EFFECTS AND ENGINEERING ANALYSIS	II
ACCURACY: SPECIFIC FUNCTIONAL DEMON: -7.5%	Aging (years)						
SERVICE: REACTOR COOLANT TEMPERATURE	Submergence	NA	NA	NA	DRWG-SS07	ENGINEERING REVIEW	NONE
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV. ABOVE FLOOD LEVEL:							

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FSAR SECTIONS.
REF 28= WESTINGHOUSE IN-CHARGE OF ENVIRONMENTAL QUALIFICATION REPORT: WCAP-9157

Notes: 4-122.8 & 22.16 & 22.35 ARE THE ADVERSE ENVIRONMENT GENERATING ACCIDENT ANALYSES FOR WHICH CREDIT IS ASSUMED FOR THE OPERATION OF THESE DEVICES.
CE1 REF. 28 STATES THAT A RADIATION DOSE OF 1000 RADS IS EQUIVALENT TO 12 YEARS OF OPERATION PLUS 2 WEEKS OF MONITORING. REVIEW OF FIG. 2-1 IN REF. 28 SHOWS THAT FOR THE ACCIDENT DOSE OF 40x10⁶ RADS SPECIFIED FOR OTHER ACCIDENT MONITORING DEVICES AT 4 MONTHS, THESE DEVICES WOULD QUALIFY FOR A NOMINAL 8 YEARS OF OPERATION.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST F	Operating Time						
PLANT ID NO: PPP-300, 001 & 302.	Temperature (°F)						
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)						
MANUFACTURER: PYLORO	Relative Humidity (%)						
MODEL NUMBER: HGM-HSBAI	Chemical Spray						
FUNCTION: ACCIDENT THROTTLE ACTUATION	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: DEMON:	Aging (years)						
SERVICE: CONTAINMENT RESERVE	Submergence						
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A							

*Documentation References:

Notes:

THESE DEVICES WERE INCLUDED IN THE FIRST SUBMITTAL OF 79-013 TO ACCOUNT FOR DEVICES REFERENCED BY ACCIDENT ANALYSIS 14.1, 14.2.5, 14.2.8 & 14.3.1.

AS SHOWN IN 8.00.16 & 8.00.35 THESE DEVICES ARE NOT EXPOSED TO AN ADVERSE ENVIRONMENT FOR AN IN-CONTAINMENT EVENT AND FOR AN ACCIDENT EVENT OUTSIDE CONTAINMENT. IN-CONTAINMENT PRESSURE SUPPRESSION IS REQUIRED. THESE DEVICES THEREFORE ARE PROBABLY PROTECTED FROM THE ACCIDENT EVENT.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST F	Operating Time						
PLANT ID NO: PPP - 300, 301 & 302	Temperature (°F)						
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)						
MANUFACTURER: FOXBORO	Relative Humidity (%)						
MODEL NUMBER: E11GM-HSAH	Chemical Spray						
FUNCTION: ACCIDENT MONITORING & ACTUATION	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: DEMON:	Aging (years)						
SERVICE: CONTAINMENT PRESSURE	Submergence						
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A							
ABOVE FLOOD LEVEL:							

*Documentation References:

Notes:

THESE DEVICES WERE INCLUDED IN THE FIRST SUBMITTAL OF 79-013 TO ACCOUNT FOR DEVICES REFERENCED BY ACCIDENT ANALYSIS P.1, 14.2.5, 14.2.8 & 14.3.1. AS DECIDED IN G.O. 2.16 & 2.12.35 THESE DEVICES ARE NOT EXPOSED TO AN ADVERSE ENVIRONMENT FOR AN IN CONTAINMENT EVENT AND FOR AN ACCIDENT EVENT OUTSIDE CONTAINMENT. NO CONTAINMENT PRESSURE SUPPRESSION IS REQUIRED. THESE DEVICES ARE ADEQUATELY PROTECTED FROM THE ACCIDENT EVENT.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST G	Operating Time						
PLANT ID NO: PPP-302.	Temperature (°F)						
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)						
MANUFACTURER: FOXBORO	Relative Humidity (%)						
MODEL NUMBER: 11-31-115001	Chemical Spray						
FUNCTION: ACCIDENT MONITORING	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: DEMON: -	Aging (years)						
SERVICE: CONTAINMENT	Submergence						
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A							
ABOVE FLOOD LEVEL: /							

*Documentation References:

Notes:

THESE DEVICES WERE INCLUDED IN THE FIRST SUBMITTAL OF 79-DIB TO ACCOUNT FOR DEVICES REFERENCED BY ACCIDENT ANALYSIS PAR. 14.2.5, 14.2.8, & 14.3.1.

AS SHOWN IN Q 072.16 & Q 072.35; THESE DEVICES ARE NOT EXPOSED TO AN ADVERSE ENVIRONMENT FOR AN INCONTAINMENT EVENT AND FOR AN ACCIDENT EVENT OUTSIDE CONTAINMENT NO CONTAINMENT PRESSURE SUPPRESSION IS REQUIRED. THESE DEVICES THEREFORE ARE ADEQUATELY PROTECTED FROM THE ACCIDENT EVENT.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST G	Operating Time						
PLANT ID NO: PPP-303	Temperature (°F)						
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)						
MANUFACTURER: FOXBORO	Relative Humidity (%)						
MODEL NUMBER: E11GM-HSARI	Chemical Spray						
FUNCTION: ACCIDENT MONITORING	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: DEMON:	Aging (years)						
SERVICE: CONTAINMENT PRESSURE	Submergence						
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL:							

*Documentation References:

Notes:

THESE DEVICES WERE INCLUDED IN THE FIRST SUBMITTAL OF 79-DIB TO ACCOUNT FOR DEVICES REFERENCED BY ACCIDENT ANALYSIS PAR. 14.2.5, 14.2.8, & 14.3.1.

AS DISCUSSED IN Q 022.16 & Q 212.35, THESE DEVICES ARE NOT EXPOSED TO AN ADVERSE ENVIRONMENT FOR AN INCONTAINMENT EVENT AND FOR AN ACCIDENT EVENT OUTSIDE CONTAINMENT NO CONTAINMENT PRESSURE SUPPRESSION IS REQUIRED. THESE DEVICES THEREFORE WERE ADEQUATELY PROTECTED FROM THE ACCIDENT EVENT.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: LIST G	Operating Time						
PLANT ID NO: PPP-303	Temperature (°F)						
COMPONENT: PRESSURE TRANSMITTER	Pressure (PSIA)						
MANUFACTURER: FOXBORO	Relative Humidity (%)						
MODEL NUMBER: E11GM-HSAB1	Chemical Spray						
FUNCTION: ACCIDENT MONITORING	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: DEMON:	Aging (years)						
SERVICE: CONTAINMENT PRESCHIE	Submergence						
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A							
ABOVE FLOOD LEVEL:							

*Documentation References:

Notes:

THESE DEVICES WERE INCLUDED IN THE FIRST SUBMITTAL OF 79-DIB TO ACCOUNT FOR DEVICES REFERENCED BY ACCIDENT ANALYSIS P.14.2.5, 14.2.8, & 14.3.1.

AS DISCUSSED IN Q 022.16 & Q 212.35, THESE DEVICES ARE NOT EXPOSED TO AN ADVERSE ENVIRONMENT FOR IN INCONTAINMENT EVENT AND FOR AN ACCIDENT EVENT OUTSIDE CONTAINMENT NO CONTAINMENT PRESSURE SUPPRESSION IS REQUIRED. THESE DEVICES THEREFORE WERE ADEQUATELY PROTECTED FROM THE ACCIDENT EVENT.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CONTAINMENT ISOLATION ISOLATION PLANT ID NO: VRC-302	Operating Time	NA	NA				
COMPONENT: RADIATION MONITOR MANUFACTURER: MODEL NUMBER: FUNCTION: ACCURACY: SPEC: $\pm 6\%$ DEMON: $\pm 10\%$	Temperature (°F)	250	120	FIG. 13-1E 103.1-3	E SPEC 677271		NONE (C)
	Pressure (PSIA)	28.8 & 29.1	28.7	113.2 & 143.4	E SPEC 677271		NONE (C)
	Relative Humidity (%)	100	100	7.5	E SPEC 677271		NONE (C)
	Chemical Spray	1.14% BORIC ACID & 15% NAOH & 4	NONE	253.6			NONE (C)
SERVICE: CONTAINMENT RADIATION	Radiation (10^6 rads)	.07	10 mK/HR	WLOP 1110-1 VOL. I	E SPEC 677271		NONE (C)
LOCATION: INSIDE CONTAINMENT	Aging (years)						
FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Submergence	NA	NA				

*Documentation References:

Notes:

(C) E. PROVIDED IN FIRST SUBMITTAL OF 77-013 TO ACCOUNT FOR DEVICES WHICH ARE A CONTAINMENT MONITORING ISOLATION ACTIVITY DEVICE. THIS DEVICE IS ONE OF THE "DEFENSE IN DEPTH" DEVICES FOR ISOLATION WHICH INCLUDES ALL ESP DETECTION DEVICES, THE CONTAINMENT AIR PARTICULATE & RADIOLOGICAL DETECTOR, CONTAINMENT PRESSURE MONITOR AND THIS PRESSURE MONITOR. SINCE FOR AN INCONTAINMENT ACCIDENT EVENT THE DEVICE SERVES A SECONDARY FUNCTION IN RELATION TO THE ESP DETECTION AND CONTAINMENT PRESSURE DEVICES THE TYPE OF CONTROL GRADE EQUIPMENT IS CONSIDERED ADEQUATE. IN THE FUTURE THIS DEVICE IS TO BE UPGRADED AS REQUIRED BY OUR COMMITMENT TO NUREG 0512. THEREFORE THIS DOES NOT REPRESENT AN OUTSTANDING ITEM. Page 131

E SPEC: V. J. J. EQUIPMENT SPECIFICATION 677271.

REPLACEMENT IS SCHEDULED FOR 1982 REFUELING OUTAGE

AEP: NRC: 00578

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CONTAINMENT VENTILATION ISOLATION PLANT ID NO: VRC-302 COMPONENT: RADIATION MONITOR MANUFACTURER: WESTINGHOUSE MODEL NUMBER: 1101 FUNCTION: ACTUATION ACCURACY: SPEC: $\pm 6\%$ DEMON: $\pm 1\%$ SERVICE: CONTAINMENT AREA RADIATION LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 614'-0" ABOVE FLOOD LEVEL: YES	Operating Time	NR	NR				
	Temperature (°F)	250	120	FIG 113. B-1E No. 3.1-3	E SPEC 677271		NONE (C)
	Pressure (PSIA)	28.8 \pm 29.1	28.7	N13.2 \pm 14.3. 4	E SPEC 677271		NONE (C)
	Relative Humidity (%)	100	100	7.5	E SPEC 677271		NONE (C)
	Chemical Spray	1.14% BORIC ACID \pm .15% N11011 PH 8.4	NONE	N53.6			NONE (C)
	Radiation (10 ⁶ rads)	.07	10 mR/HR	WLHP 7410-1 VOL I	E SPEC 677271		NONE (C)
	Aging (years)						
	Submergence	NR	NR				

*Documentation References:

Notes:

(C) INCLUDED IN FIRST SUBMITTAL OF 79-01B TO ACCOUNT FOR DEVICES WHICH ARE A CONTAINMENT PURGING ISOLATION ACTUATION DEVICE. THIS DEVICE IS ONE OF THE "DEFENSE IN DEPTH" DEVICES FOR ISOLATION WHICH INCLUDES ALL ESF ACTUATION DEVICES, THE CONTAINMENT AIR PARTICULATE & RADIOGAS DETECTOR, CONTAINMENT PRESSURE AND THIS AREA MONITOR. SINCE FOR AN INCONTAINMENT ACCIDENT EVENT THIS DEVICE SERVES A SECONDARY FUNCTION IN RELATION TO THE ESF ACTUATION AND CONTAINMENT PRESSURE DEVICES THE USE OF CONTROL GRADE EQUIPMENT IS CONSIDERED ADEQUATE. FURTHER THIS DEVICE IS TO BE UPGRADED AS REQUIRED BY OUR COMMITMENT TO NUCLEAR 0578 ITEMS. THEREFORE THIS DOES NOT REPRESENT AN OUTSTANDING ITEM. Page 121

E SPEC: WESTINGHOUSE EQUIPMENT SPECIFICATION 677271.

REPLACEMENT IS SCHEDULED FOR 1982 REFUELING OUTAGE

REP: NRC: 00578

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: ESW	Operating Time	1 day		WCAP 9600			NONE
PLANT ID NO: WPS702, 706	Temperature (°F)	Fig 0-27	See note below	FSAR APP 0			NONE
COMPONENT: Pressure switch	Pressure (PSIA)	Fig 0-27	See note below	FSAR APP 0			NONE
MANUFACTURER: Mercooid	Relative Humidity (%)	NA	NA	NA	NA	NA	NA
MODEL NUMBER: DA-7031-153	Chemical Spray	NA	NA	NA	NA	NA	NA
FUNCTION: Auto. pump Start	Radiation (10 ⁶ rads)	NA	NA	NA	NA	NA	NA
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: ESW pressure	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: Outside containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA							

*Documentation References:

Notes: Justification for not having these switches qualified is as follows: The normally closed contact of these switches allows automatic starting of the ESW pump motors. Should the accident disable the switch making its contact go open (and stay open), the motor can be started by manually placing the control switch in the "close" position. We intend to replace these switches with ones that are qualified to survive the HEBB environment.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Reactor Coolant	Operating Time	1 DAY	30 DAYS	Table 7.5-2 FSAR	43	Seq.	NONE
PLANT ID NO.: Same as valve served	Temperature (°F)	Fig 022.9-1, -2	340	FSAR PIP P	43	Seq.	NONE
COMPONENT: Limit Switch	Pressure (PSIA)	Fig 1 Fig 2	84.7	ASME 6504	43	Seq.	NONE
MANUFACTURER: Namco	Relative Humidity (%)	100	100		43	Seq.	NONE
MODEL NUMBER: EA 180 *	Chemical Spray	2000 ppm B 1.14 wt % Boric PH 9-11 Acid	3000 ppm B 1.72 wt % Boric PH 10.5 Acid	T.S. 314.5 314.5.6	43	Seq.	NONE
FUNCTION: valve position indication	Radiation (10 ⁶ rads)	28	204	WCAP 7410-L Vol 1	43	Seq.	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)				1	Seq.	NONE
SERVICE: Per PORV's: NRV-151, 152, -153	Submergence	NA	NA	NA	NA	NA	NONE
LOCATION: In Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: yes							

*Documentation References:

43. Acme-Cleveland Development Co: Qual of Namco Controls
Limit Switch, Sept 5, 1978

Notes:

* to be installed as per NUREG 578

from Ref. 43. QUAL. OF NAMCO CONTROLS Limit Switch

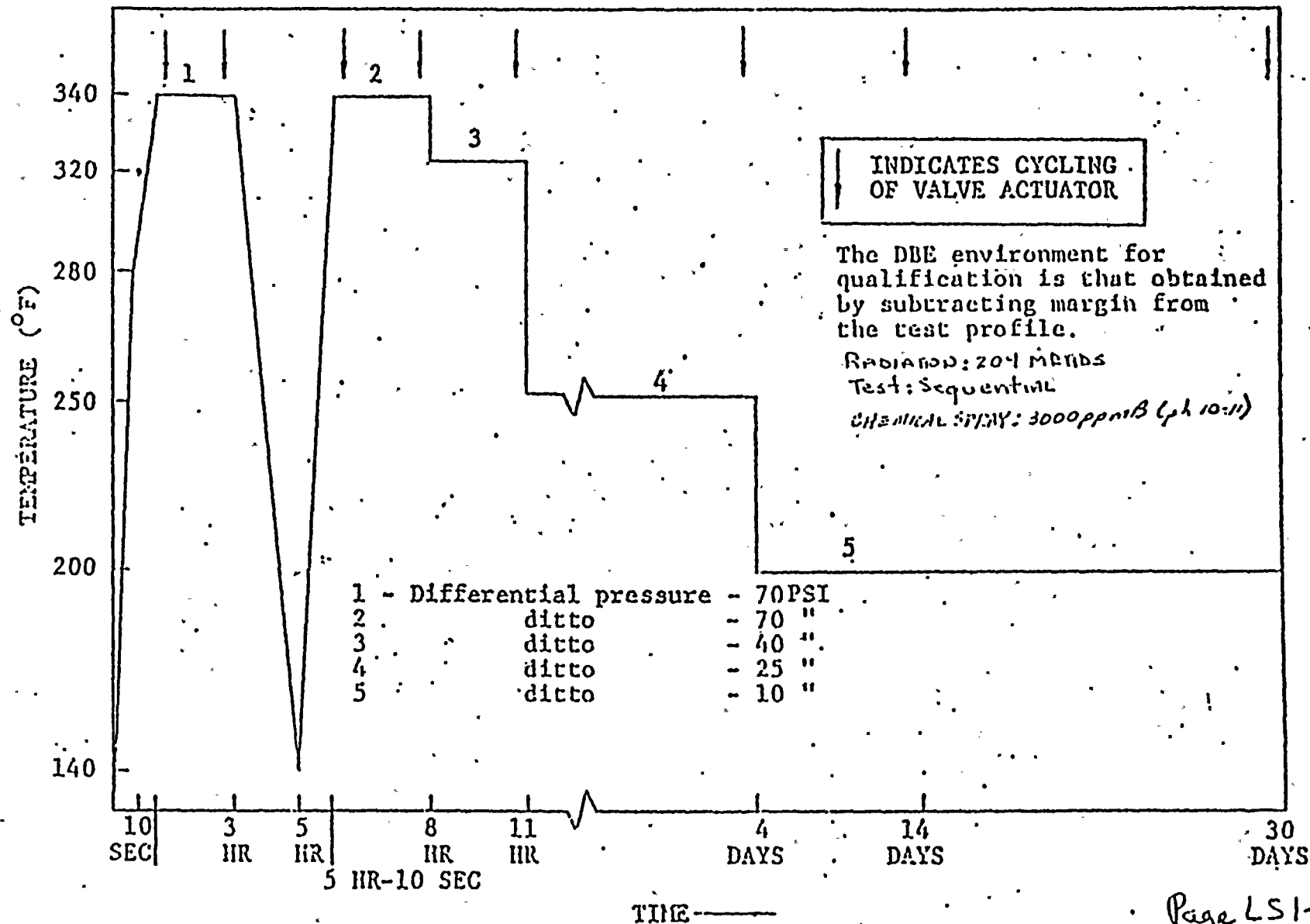


Fig 1
Test Chamber Temperature Profile for Accident Environment Simulation.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CYC S, SI, RIR	Operating Time	1 YEAR	≤ 1.1 yr		See Note B.	Engineering Review	NONE
PLANT ID NO: PP-050,026, 035	Temperature (°F)	NA	NA	NA	NA	NA	NA
COMPONENT: Pump Motor	Pressure (PSIA)	NA	NA	NA	NA	NA	NA
MANUFACTURER: WESTINGHOUSE	Relative Humidity (%)	NA	NA	NA	NA	NA	NA
MODEL NUMBER: 5808Z, 5009H, 5009-P24	Chemical Spray	NA	NA	NA	NA	NA	NA
FUNCTION: Emergency Core Cooling	Radiation (10 ⁶ rads)	16.6	200	See Note A	See Note B	Engineering Review	NONE
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: Condensate Charging, Safety Injection & Residual Heat Removal Pumps	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: Outside Containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA							

*Documentation References:

Notes:

- A) AEPSC NSRL calculation DC-N-6520-2.
- B) Westinghouse Test Report WCAP 2829.
 letter of LFCISO(AEP) to F.Noon(WEL) of 3-20-80.
 letter of F.Noon(WEL) to LFCISO(AEP) of 4-21-80.

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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Containment Spray PLANT ID NO: PP-009 COMPONENT: Pump Motor MANUFACTURER: Reliance MODEL NUMBER: Frame # 5810 P FUNCTION: CT Spray ACCURACY: SPEC: NA DEMON: NA SERVICE: Containment Spray Pump LOCATION: Outside CT FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Operating Time	1 year	71.1% C		64	Engineering Review	NONE
	Temperature (°F)	NA	NA	NA	NA	NA	NA
	Pressure (PSIA)	NA	NA	NA	NA	NA	NA
	Relative Humidity (%)	NA	NA	NA	NA	NA	NA
	Chemical Spray	NA	NA	NA	NA	NA	NA
	Radiation (10 ⁶ rads)	17	100	AEPSC NS&L Calc. DC-2 6420-2	64	Engineering Review	NONE
	Aging (years)						
	Submergence	NA	NA	NA	NA	NA	NA

*Documentation References:

Notes:

64: Letter of 4/28/80

From: PK Eapin

To: AEP-NRC-00344D

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OF EQUIP.
(Page)

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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MAIN FEEDWATER & CONTAINMENT ISOLATION PLANT ID NO: FKV-210,220, 230 & 240 COMPONENT: DIAPHRAM FOR AIR OPERATOR MANUFACTURER: FISHER CONTROLS CO. MODEL NUMBER: 667 FUNCTION: SHUTOFF & REGULATION ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED SERVICE: FEEDWATER FLOW REGULATION LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: FRV-210,220,230, 240	Operating Time	NA	NA	EMRGY PKDCS	ENGRG ADGNT		NONE
PLANT ID NO: EPT 210,220, 230 & 240	Temperature (°F)	223	320/288	FIG D-26	MNFTR LIT	SEQUENTIAL	NONE
COMPONENT: ELECTRO- PNEUMATIC TRANSDUCER	Pressure (PSIA)	20.5	90/59	FIG D-26	MNFTR LIT	SEQUENTIAL	NONE
MANUFACTURER: FISHER CONTROLS COMPANY	Relative Humidity (%)	100	100	FIG D-26	MNFTR LIT	SEQUENTIAL	NONE
MODEL NUMBER: 546	Chemical Spray	NA	NA				NONE
FUNCTION: VALVE MODULATION CONTROL	Radiation (10 ⁶ rads)	NA	NA				NONE
ACCURACY: SPEC: FUNCTIONAL DEMON: FUNCTIONAL	Aging (years)						
SERVICE: MAIN FEEDWATER FLOW CONTROL	Submergence	NA	NA				NONE
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL:							

*Documentation References: FSAK APPENDIX D:

MNFTR LIT - FISHER CONTROLS COMPANY

OPERATIONAL TESTS OF FISHER

TYPE 546 ELECTRO-PNEUMATIC TRANSDUCER

Notes:

The subject transducer is not required for the FRV to perform its safety function in the case of a lock or



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: FV-210, FRV-220, FRV-230, FRV-240	Operating Time	25 SEC.	5 SEC.	D.4.2		VALVE TESTING	NONE
PLANT ID NO: X50-241, 242, 243, 244, 245, 246, 247, 248	Temperature (°F)	223	140	FIG. 7-26	MANF. LIT.	ANALYSIS, FASID, AND MEASURED DATA & MANF. LIT.	YES (F) REPLACE WITH MODEL 206-381-28VU
COMPONENT: SOLENOID VALVE	Pressure (PSIA)	20.5	NA	FIG 0-26			II
MANUFACTURER: AUTOMATIC SWITCH COMPANY	Relative Humidity (%)	100	NA	FIG 0-26			II
MODEL NUMBER: H1-830058RU OR H1-830058RU	Chemical Spray	NR	NR				
FUNCTION: TRIP REGULATOR VALVE CLOSED.	Radiation (10 ⁶ rads)	NR	NR				
ACCURACY: SPEC: FUNCTIONAL DEMONSTRATION	Aging (years)	NR	NR				
SERVICE: MAIN FLOWMETER REGULATING VALVES, TRIP VALVES	Submergence	NR	NR				
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A							
ABOVE FLOOD LEVEL: N/A							

*Documentation References: UNLESS OTHERWISE NOTED REFERENCES ARE FSAR SECTIONS

Notes: D.4.2, H.2.5 & H.2.8 ARE THE ADVERSE ENVIRONMENT ACCIDENT ANALYSES FOR WHICH CREDIT FOR FUNCTION IS ASSUMED.

PRESSANT CONFIGURATION ACCEPTABLE PENDING
 EQUIPMENT REPLACEMENT BECAUSE: MAIN FLOWMETER
 TRIP-REGULATORS FMO-201 202 203 204 AND
 FLOWMETER VALVES FMO-251 & 252 AND
 FLOWMETER ALSO STOP FLOWMETER TRIP
 WITHIN THE FRAME OF D.4.2 ADVERSE ANALYSIS.
 MANF. LIT: AUTOMATIC SWITCH CO. CATALOG NO. 30.
 BULLETINS 8300, 8302, 8315.

(F) QUALIFIED REPLACEMENTS ORDERED VIA
 PURCHASE ORDER 7875-251-9 DATED MAY. 1, 1977.
 DEVICE IS ON SITE.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: RESIDUAL HEAT REMOVAL PLANT ID NO: IRY-310 & 320 COMPONENT: DIAPHRAM FOR HIF. OPERATOR MANUFACTURER: BAILEY MODEL NUMBER: 656 FUNCTION: VALVE POSITIONING ACCURACY: SPEC:FAIL OPEN DEMON:FAIL OPEN SERVICE: RHH HEAT EXCHANGER OUTLET FLOW MODULATION LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MAIN STEAM & CONTAINMENT ISOLATION	Operating Time						
PLANT ID NO: MKV 210, 220, 230 & 240	Temperature (°F)						
COMPONENT: STEAM PISTON FOR SLIDE VALVE	Pressure (PSIA)						
MANUFACTURER: ATWOOD-MOKEL	Relative Humidity (%)						
MODEL NUMBER: 11711E	Chemical Spray						
FUNCTION: SHUTOFF	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED	Aging (years)						
SERVICE: MAIN STEAM FLOW SHUTOFF	Submergence						
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A							

*Documentation References:

Notes: VENTING OF THE STEAM SPACE ABOVE THE PISTON BY DUMP VALVES MKV-211, 212, 221, 222, 231, 232, 241 OR 242 FOR THEIR RESPECTIVE STEAM GENERATOR STOP VALVE WILL CAUSE MAIN STEAM SYSTEM PRESSURE TO DRIVE THE'S VALVE CLOSED. SEE PSAR SECTION 10 AND RESP. TO QUESTIONS 10.1 & 10.2 FOR FULL DESCRIPTION OF VALVE OPERATION.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	GUTS TESTING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MAIN STEAM	Operating Time						
PLANT ID NO: MRV 211, 212, 221, 222, 231, 232, 241 & 242	Temperature (°F)						
COMPONENT: DIMPHERM FOR AIR OPERATOR	Pressure (PSIA)						
MANUFACTURER: FISHER CONTROLS CO.	Relative Humidity (%)						
MODEL NUMBER: 657	Chemical Spray						
FUNCTION: SHUTOFF INITIATION	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: FAIL OPEN DEMON: FAIL OPEN	Aging (years)						
SERVICE: STEAM GENERATOR STOP VALVE DUMP VALVE	Submergence						
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: N/A							
ABOVE FLOOD LEVEL: N/A							

*Documentation References:

Notes:



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MRY 211, 212, 221, 222, 231, 232, 241 & 242	Operating Time	5 SEC	5 SEC	14.2.5	TECH SPEC 3.7.1.5	RESPONSE TIME TESTING	NONE
PLANT ID NO: XSO-211, 212, 221, 222, 231, 232, 241 & 242	Temperature (°F)	230	180	FIG 0-27	MFTK LIT		NONE (L)
COMPONENT: SOLENOID	Pressure (PSIA)	26.2	14.7	FIG 0-27	MFTK LIT		NONE (L)
MANUFACTURER: AUTOMATIC SWITCH CO.	Relative Humidity (%)	100	0	7.5	MFTK LIT		NONE (L)
MODEL NUMBER: HT 8316 B17	Chemical Spray	NA	NA				NA
FUNCTION: CLOSURE	Radiation (10 ⁶ rads)	NA	NA				NA
ACTION: ACTUATION	Aging (years)						
ACCURACY: SPEC: FUNCTIONAL DEMOK: FUNCTIONAL	Submergence	NA	NA				NA
SERVICE: STEAM GENERATOR STOP VALVE DUMP VALVE							
LOCATION: OUTSIDE CONTAINMENT							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL:							

* Documentation References:

MFTK LIT - AUTOMATIC SWITCH CO.
CATALOG NO 30
BULLETIN 8316

Notes: 14.2.5 & 14.2.8 ARE THE ADVERSE ENVIRONMENT ACCIDENT ANALYSIS FOR WHICH CREDIT IS ASSUMED FOR OPERATION OF THE DEVICE.

(L) ACCIDENT ANALYSIS: Q212.25 SHOWS THAT MAIN STEAM LINE BREAK PLUS THE FAILURE OF ANOTHER STEAM LINE TO ISOLATE IS ACCEPTABLE. SINCE THE LOCATION OF THESE DEVICES IS SUCH THAT ONLY TWO STEAM GENERATOR STOP VALVES CAN BE AFFECTED BY ANY ONE BREAK, USE OF CONTROL GRID DEVICES IS ACCEPTABLE.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MAIN STEAM & CONTAINMENT ISOLATION PLANT ID NO: MRV 213, 223, 233 & 243 COMPONENT: DIAPHRAM FOR AIR OPERATOR MANUFACTURER: FISHER CONTROLS CO. MODEL NUMBER: 667 FUNCTION: PRESSURE RELIEF ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED SERVICE: MAIN STEAM PRESSURE RELIEF LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: N/A ABOVE FLOOD LEVEL: N/A	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:

No credit is taken for
 the subject MRV's (the Steam Generator
 PORV's) in LOCA or HCLB accident analysis.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: MRY-213, 223, 233 & 243 PLANT ID NO: EPT-213, 223, 233 & 243 COMPONENT: ELECTRO- PNEUMATIC TRANSDUCER MANUFACTURER: FISHER CONTROLS CO. MODEL NUMBER: 546 FUNCTION: VALVE MODULATION CONTROL ACCURACY: SPEC: FUNCTIONAL DEMON: FUNCTIONAL SERVICE: MAIN STEAM PRESSURE RELIEF LOCATION: OUTSIDE CONTAINMENT FLOOD LEVEL ELEV: NR ABOVE FLOOD LEVEL:	Operating Time	NR	NR	EMRGY PROC	ENGRG ADJMT		NONE
	Temperature (°F)	230	320/280	F16 0-27	MNFR LIT	SEQUENTIAL	NONE
	Pressure (PSIA)	26.2	90/59	F16 0-27	MNFR LIT	SEQUENTIAL	NONE
	Relative Humidity (%)	100	100	F16 0-27	MNFR LIT	SEQUENTIAL	NONE
	Chemical Spray	NR	NR				NONE
	Radiation (10 ⁶ rads)	NR	NR				NONE
	Aging (years)						
	Submergence	NR	NR				NONE

*Documentation References: FSNE APPENDIX D
 MNFR LIT. FISHER CONTROLS COMPANY
 OPERATIONAL TESTS OF FISHER
 TYPE 546 ELECTRO-PNEUMATIC
 TRANSDUCER

Notes: No credit is taken for the subject
 MRY's (the Steam Generator PORV)
 for LOCA or HELB accident analysis.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: REACTOR COOLANT PLANT ID NO: NRV-151 152 & 153 COMPONENT: DIPHARM FAIL FAIL OPERATOR MANUFACTURER: MASONIELAN MODEL NUMBER: 37 AND 38 FUNCTION: PRESSURE RELIEF ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED SERVICE: PRESSURIZER POWER OPERATED RELIEF VALVE LOCATION: INSIDE SUBMERSION FLOOD LEVEL ELEV: 612' ABOVE FLOOD LEVEL: YES	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:



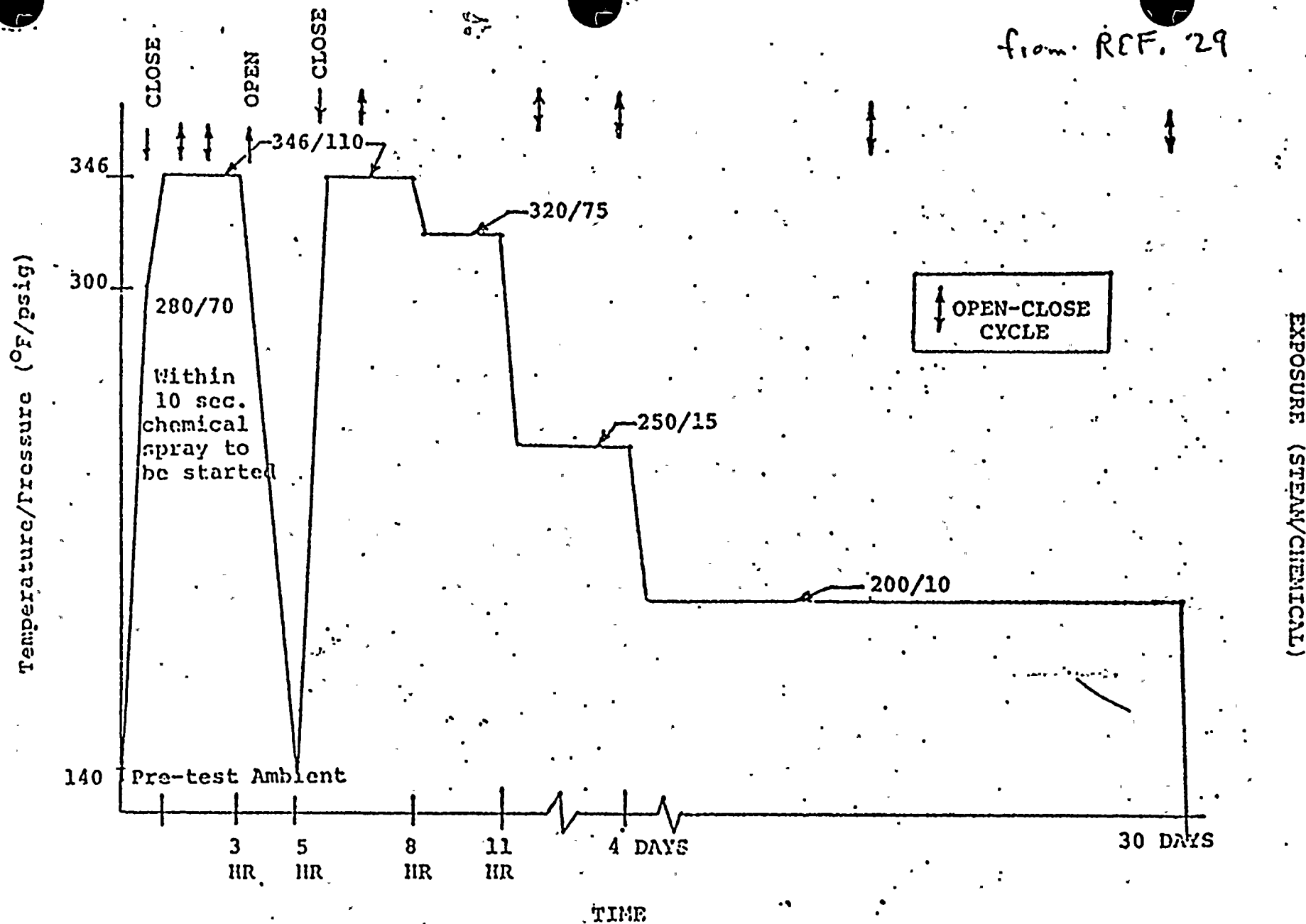
EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: NPV-151 NRY-152 NPV-153	Operating Time	NA	NA	NA	SEE NOTE		NONE
PLANT ID NO: XSD-503 XSD-505 XSD-507	Temperature (°F)	328.2	SEE TEST PROFILE	FIG 022.9-1 E-2	REF. 29	SEQUENTIAL	NONE
COMPONENT: SOLENOID VALVE MANUFACTURER: AUTOMATIC CONTROL COMPANY MODEL NUMBER: NP-831654V	Pressure (PSIA)	35.5	SEE TEST PROFILE	N13.8	II	II	II
	Relative Humidity (%)	100	100	7.5	II	II	II
FUNCTION: TRIP CONTROL VALVE CLOSED ACCURACY: SPEC: FUNCTIONAL DEMON: FUNCTIONAL	Chemical Spray	1.14% BORIC ACID & 15% NROH	30% TPA BORIC ACID WITH NROH NROH SAO ₂	N 5.3.6	II	II	II
SERVICE: PRESSURE CONTROL	Radiation (10 ⁵ rads)	40	150	REF. 30	II	II	II
LOCATION: INSIDE CONTAINMENT	Aging (years)		4		II	II	II
FLOOD LEVEL ELEV: 612'-0" ABOVE FLOOD LEVEL: YES	Submergence	NA	NA	NA	REF. 30	ENGINEERING DRAWING REVIEW	

*Documentation References: UNLESS OTHERWISE NOTED ALL REFERENCES ARE FROM SECTIONS.
BY WESTINGHOUSE ELECTRIC CORP.
KIDDER A&S 21678/1R.

Notes: FUNCTION OF THESE DEVICES IS NOT ASSUMED BY ADVERSE ENVIRONMENT ACCIDENT ANALYSIS. SEE GENERAL NOTE 4.

REF. 30 - WESTINGHOUSE ELECTRIC CORP.
COMMUNICATIONS NS-TMB-1950.

from REF. 29



Temperature/Pressure Profile for simulation of loss-of coolant accident (LOCA) design basis event (DBE) by steam/chemical-spray environmental exposure.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CONTAINMENT ISOLATION	Operating Time						
PLANT ID NO: VCR-11 & 21	Temperature (°F)						
COMPONENT: DIAPHRAM FOR DIK OPERATOR	Pressure (PSIA)						
MANUFACTURER: G. KINNELL	Relative Humidity (%)						
MODEL NUMBER: 3250	Chemical Spray						
FUNCTION: ISOLATION	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED	Aging (years)						
SERVICE: ICE CONDENSER REFRIGERANT SUPPLY	Submergence						
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 612'-0"							
ABOVE FLOOD LEVEL: YES							

*Documentation References:

Notes: FAILURE MECHANISM OF DIAPHRAM, DUE TO ACTUATOR SPRING LOADING, WILL CAUSE VALVE TO POSITION TO PROPER POSITION. THEREFORE NO QUALIFICATION TO ACCIDENT CONDITIONS IS NECESSARY.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CONTAINMENT ISOLATION PLANT ID NO: VCR-101 & 102 COMPONENT: DIAPHRAM FOR AIR OPERATOR MANUFACTURER: BAILEY MODEL NUMBER: 656 FUNCTION: ISOLATION ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED SERVICE: INSTRUMENT ROOM PURGE SUPPLY & EXHAUST RESPECTIVELY LOCATION: INSIDE CONTAINMENT FLOOD LEVEL ELEV: 612'-0" ABOVE FLOOD LEVEL: YES	Operating Time						
	Temperature (°F)						
	Pressure (PSIA)						
	Relative Humidity (%)						
	Chemical Spray						
	Radiation (10 ⁶ rads)						
	Aging (years)						
	Submergence						

*Documentation References:

Notes:

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CONTAINMENT ISOLATION	Operating Time						
PLANT ID NO: VCR-1031105	Temperature (°F)						
COMPONENT: DIAPHRAM FOR AIR OPERATOR	Pressure (PSIA)						
MANUFACTURER: BAILEY	Relative Humidity (%)						
MODEL NUMBER: 722 & 732 RESPECTIVELY	Chemical Spray						
FUNCTION: ISOLATION	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED	Aging (years)						
SERVICE: CONTAINMENT PURGE SUPPLY	Submergence						
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 612'-0"							
ABOVE FLOOD LEVEL: YES							

*Documentation References:

Notes:

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CONTAINMENT ISOLATION	Operating Time						
PLANT ID NO: VCR-1041106	Temperature (°F)						
COMPONENT: DIAPHRAM FOR AIR OPERATOR	Pressure (PSIA)						
MANUFACTURER: BAILEY	Relative Humidity (%)						
MODEL NUMBER: 7137 C 722 RESPECTIVELY	Chemical Spray						
FUNCTION: ISOLATION	Radiation (10 ⁶ rads)						
ACCURACY: SPEC:FAIL CLOSED DEMON:FAIL CLOSED	Aging (years)						
SERVICE: CONTAINMENT LARGE EXHAUST	Submergence						
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 612'-04"							
ABOVE FLOOD LEVEL: YES							

*Documentation References:

Notes:

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CONTAINMENT ISOLATION	Operating Time						
PLANT ID NO: VCR-107	Temperature (°F)						
COMPONENT: DIAPHRAM FOR AIR OPERATOR	Pressure (PSIA)						
MANUFACTURER: BAILEY	Relative Humidity (%)						
MODEL NUMBER: 656	Chemical Spray						
FUNCTION: ISOLATION	Radiation (10 ⁶ rads)						
ACCURACY: SPEC: FAIL CLOSED DEMON: FAIL CLOSED	Aging (years)						
SERVICE: CONTAINMENT PRESSURE RELIEF EXHAUST	Submergence						
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 612'-0"							
ABOVE FLOOD LEVEL: YES							

*Documentation References:

Notes:

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VCF-11, 21, 31, 102, 103, 104, 105, 106 & 107	Operating Time	5 SEC.	≤ 10 SEC.	REF. 022-1	REF. 2.4-1	TIME RESPONSE TESTING	NONE
PLANT ID NO: XSO-12, 21, 121, 122, 123, 124, 125, 126 & 127	Temperature (°F)	328.2	SEE TEST PROFILE	REF. 022-1 8-2	REF. 2.9	SERVENTIAL	NONE
COMPONENT: 5.01 EMODIN VALVE	Pressure (PSIA)	35.5	SEE TEST PROFILE	N 13.8	11	11	11
MANUFACTURER: AUTOMATIC SWITCH COMPANY	Relative Humidity (%)	100	100	7.5	11	11	11
MODEL NUMBER: NP-82.16.54 V	Chemical Spray	1.14% FORT. ACID AND 0.15% NaOH	500 PPM FORT. ACID WITH 1.00% Na ₂ S ₂ O ₈	N 5.3.6	11	11	11
FUNCTION: TRIP ISOLATION VALVE CLOSED	Radiation (10 ⁶ rads)	40	150	REF. 30	11	11	11
ACCURACY: SPEC: FUNCTIONAL DEMON: 100%	Aging (years)		4		11	11	11
SERVICE: CONTINUOUSLY IN OPERATION & ICE CONDITION	Submergence	NA	NA	NA	A.E.T. DRWG.	ENGINEERING DRAWING REVIEW	11
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 11-418.0							
ABOVE FLOOD LEVEL: YES							

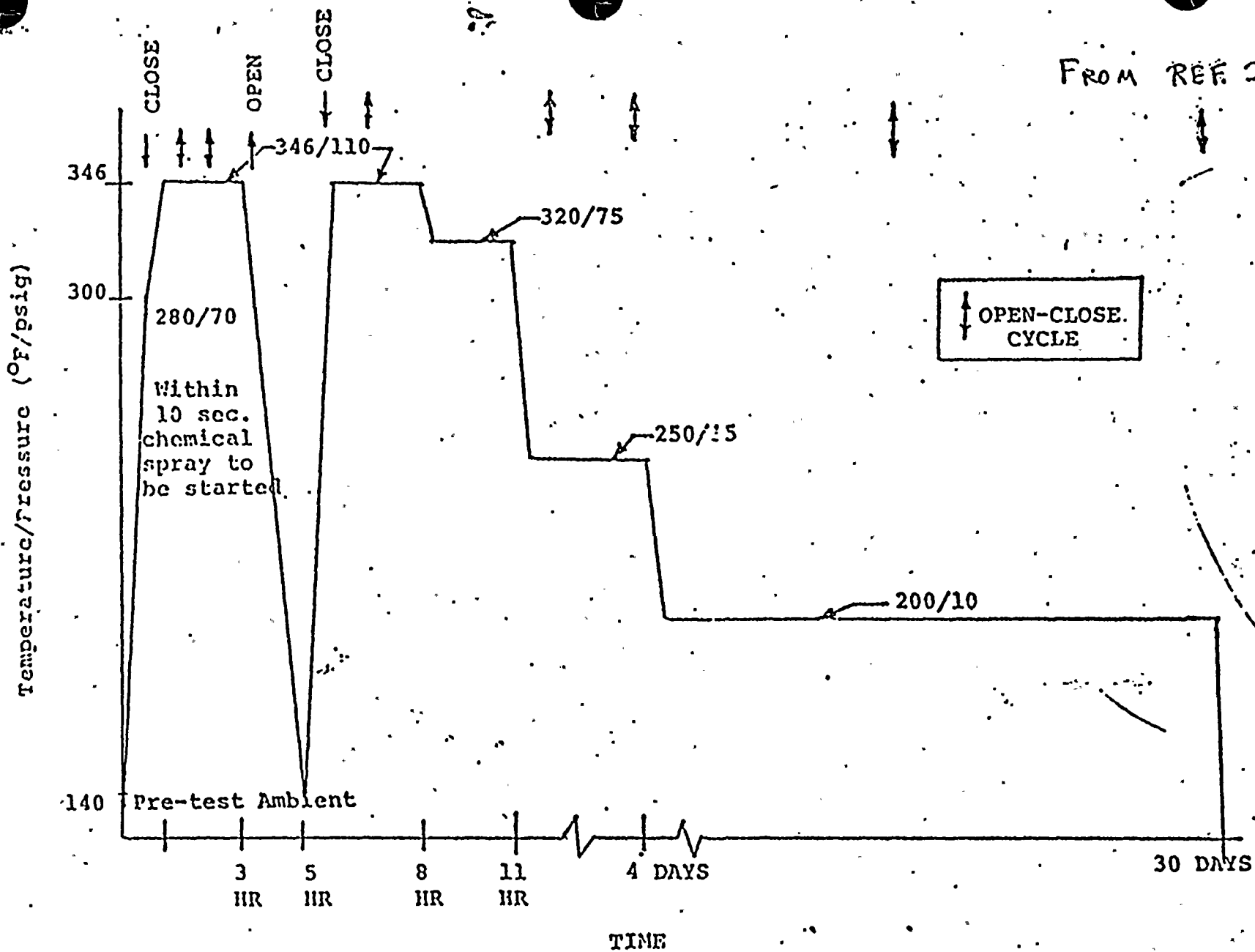
*Documentation References: UNLESS OTHERWISE NOTED
 ALL PRINCIPALS ARE FSAR SECTIONS.

Notes:

REF 024: AUTOMATIC SWITCH COMPANY
 REPORT HAS 21678/TK.

REF 025: WESTINGHOUSE ELECTRIC CORP.
 COMMUNICATION HS-TMA-1950.





Temperature/Pressure Profile for simulation of loss-of coolant accident (LOCA) design basis event (DBE) by steam/chemical-spray environmental exposure.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM:	Operating Time	1 HR	7 DAYS	Table 7.5-2	22	Simul.	None
PLANT ID NO: QCM-250	Temperature (°F)	FIG 022.9-1,-2	330	FSAR APP Q	22	Simul.	None
COMPONENT: CONTROL CABLE TERMINATION MANUFACTURER: NA	Pressure (PSIA)	FIG 1 FIG 2	104.7	AEW 6104	22	Simul.	None
MODEL NUMBER: CABLE TERMINATION AT QCM-250.	Relative Humidity (%)	100	100		22	Simul.	None
FUNCTION:	Chemical Spray	2000 ppm 114 wt % B-RIC PH 9-11 Acid	2600 ppm 1.59 wt % B-RIC PH 7.67 Acid	T.S. 314.5 314.5.6	22	Simul.	None
ACCURACY: SPEC: NA DEMON: NA	Radiation (10 ⁶ rads)	4	see note A	WCAP 7410-L vol. 1	Note A	Engineering Review	None
SERVICE: AT VALVE LIMIT SWITCH	Aging (years)						
LOCATION: IN CONTAINMENT							
FLOOD LEVEL ELEV: 612' ABOVE FLOOD LEVEL: No	Submergence	submerged	FLOOD UP TUBES		61	COMBINATION	None

*Documentation References:

22. Limitorgue Corp Test Report #600198
61. FLOODUP TUBE Qual. Packet

Notes:

- A) Valve will perform its function in the first 15 sec. (Tech Spec Table 306-1), corresponding to a calculated LOCA dose of only 0.02×10^6 rads (WCAP 7410-L Fig. 5), not significantly more than its normal environment accumulated dose.

from Ref. 22. Qualified by Limitorque Corp. Test Laboratory
Project #600193. November 1968

22
9:
Type of Test: simultaneous, steam
chemical spray
separate seismic test

Type Profile:

328°F, 90 psig for 1 hr
312°F, 70 psig for 2 hrs
287°F, 40 psig for 2 hrs
271°F, 20 psig for 19 hrs
250°F, 15 psig for 6 days

Chemical Spray:

1.5% boric acid buffered with Na OH to a PH of 7.67.

Seismic Test 8/20/79

Horizontal Force, 5.3 G at 35 Hz
Vertical force 5.3 G at 35 Hz
No resonance freq from 5 to 35 Hz



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	16 DAYS	Table 2 7.5-2	24	Seq.	None
PLANT ID NO: N/A	Temperature (°F)	Fig 13.13-1 (Upper Values)	250	FSAR APP N	24	Seq.	None
COMPONENT: CONTROL CABLE TERMINATION	Pressure (PSIA)	Fig 1 Fig 2	39.7	AEW 6504	24	Seq.	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100		24	Seq.	None
MODEL NUMBER: CABLE TERMINATION AT VALVES	Chemical Spray	See note A	NA	See Note B	NA	NA	None
FUNCTION:	Radiation (10 ⁶ rads)	4	20	WCAP 7410-L Vol 1	24	Seq.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS							
LOCATION: In Containment							
FLOOD LEVEL ELEV: 612' ABOVE FLOOD LEVEL: yes	Submergence	NA	NA	NA	NA	NA	NA

*Documentation References:

24. Limiting Test Report #600461

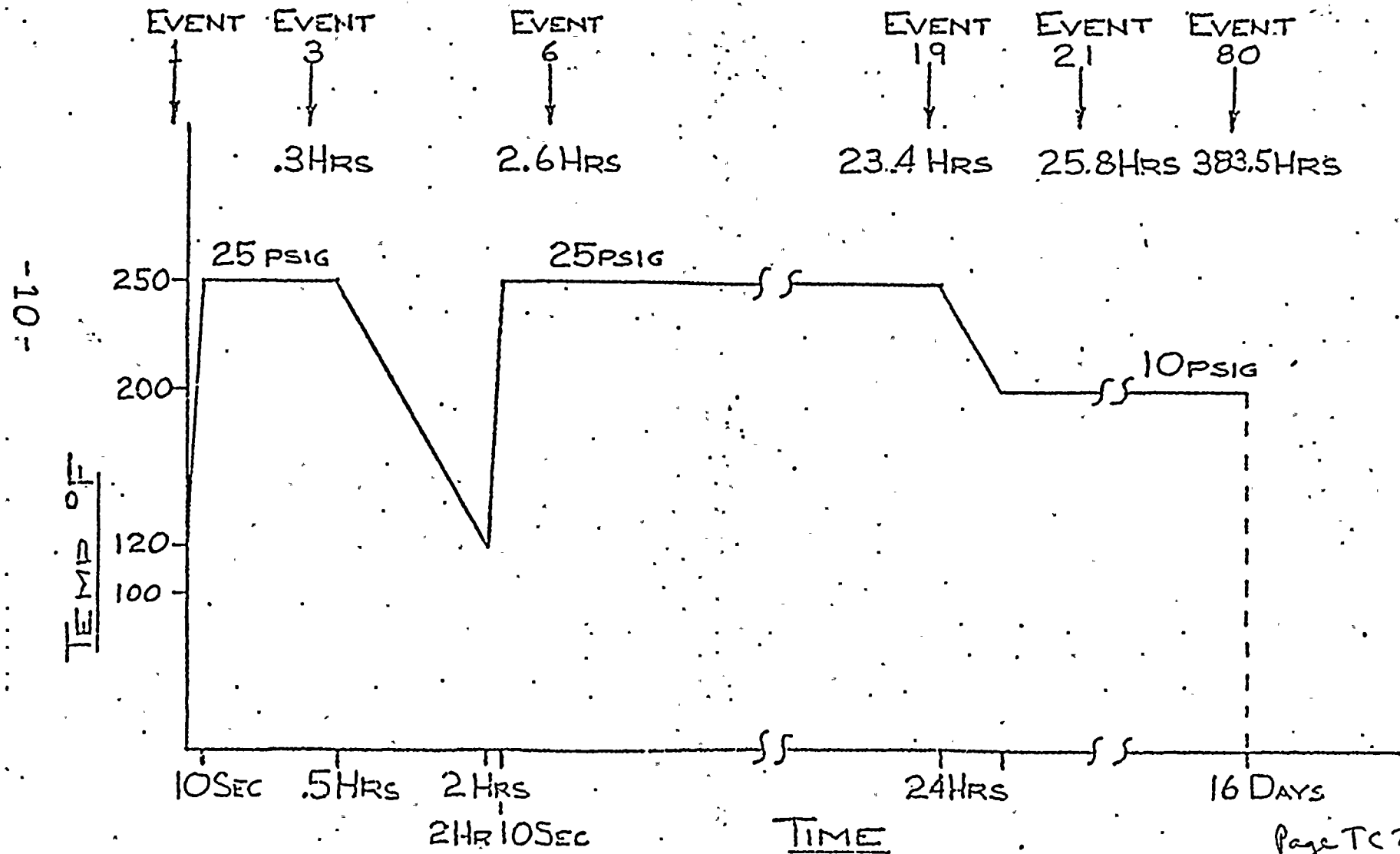
Notes:

A) VALVE Location is not subjected to direct caustic spray impingement.

B) mechanical drawings
1-5427



TEMPERATURE PROFILE



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	Q JAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 DAY</i>	<i>30 DAYS</i>	<i>Spec. A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV, IW, IX, IY, IZ, JA, JB, JC, JD, JE, JF, JG, JH, JI, JJ, JK, JL, JM, JN, JO, JP, JQ, JR, JS, JT, JU, JV, JW, JX, JY, JZ, KA, KB, KC, KD, KE, KF, KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ, LA, LB, LC, LD, LE, LF, LG, LH, LI, LJ, LK, LL, LM, LN, LO, LP, LQ, LR, LS, LT, LU, LV, LW, LX, LY, LZ, MA, MB, MC, MD, ME, MF, MG, MH, MI, MJ, MK, ML, MM, MN, MO, MP, MQ, MR, MS, MT, MU, MV, MW, MX, MY, MZ, NA, NB, NC, ND, NE, NF, NG, NH, NI, NJ, NK, NL, NM, NN, NO, NP, NQ, NR, NS, NT, NU, NV, NW, NX, NY, NZ, OA, OB, OC, OD, OE, OF, OG, OH, OI, OJ, OK, OL, OM, ON, OO, OP, OQ, OR, OS, OT, OU, OV, OW, OX, OY, OZ, PA, PB, PC, PD, PE, PF, PG, PH, PI, PJ, PK, PL, PM, PN, PO, PP, PQ, PR, PS, PT, PU, PV, PW, PX, PY, PZ, QA, QB, QC, QD, QE, QF, QG, QH, QI, QJ, QK, QL, QM, QN, QO, QP, QQ, QR, QS, QT, QU, QV, QW, QX, QY, QZ, RA, RB, RC, RD, RE, RF, RG, RH, RI, RJ, RK, RL, RM, RN, RO, RP, RQ, RR, RS, RT, RU, RV, RW, RX, RY, RZ, SA, SB, SC, SD, SE, SF, SG, SH, SI, SJ, SK, SL, SM, SN, SO, SP, SQ, SR, SS, ST, SU, SV, SW, SX, SY, SZ, TA, TB, TC, TD, TE, TF, TG, TH, TI, TJ, TK, TL, TM, TN, TO, TP, TQ, TR, TS, TT, TU, TV, TW, TX, TY, TZ, UA, UB, UC, UD, UE, UF, UG, UH, UI, UJ, UK, UL, UM, UN, UO, UP, UQ, UR, US, UT, UU, UV, UW, UX, UY, UZ, VA, VB, VC, VD, VE, VF, VG, VH, VI, VJ, VK, VL, VM, VN, VO, VP, VQ, VR, VS, VT, VU, VV, VW, VX, VY, VZ, WA, WB, WC, WD, WE, WF, WG, WH, WI, WJ, WK, WL, WM, WN, WO, WP, WQ, WR, WS, WT, WU, WV, WW, WX, WY, WZ, XA, XB, XC, XD, XE, XF, XG, XH, XI, XJ, XK, XL, XM, XN, XO, XP, XQ, XR, XS, XT, XU, XV, XW, XX, XY, XZ, YA, YB, YC, YD, YE, YF, YG, YH, YI, YJ, YK, YL, YM, YN, YO, YP, YQ, YR, YS, YT, YU, YV, YW, YX, YY, YZ, ZA, ZB, ZC, ZD, ZE, ZF, ZG, ZH, ZI, ZJ, ZK, ZL, ZM, ZN, ZO, ZP, ZQ, ZR, ZS, ZT, ZU, ZV, ZW, ZX, ZY, ZZ</i>	23	<i>Sep.</i>	<i>None</i>
PLANT ID NO: <i>N/A</i>	Temperature (°F)	<i>FIG 022.9-1,2</i>	<i>340</i>	<i>FSAR App 9</i>	23	<i>SEP.</i>	<i>None</i>
COMPONENT: <i>CONTROL CABLE TERMINATION</i> MANUFACTURER: <i>N/A</i>	Pressure (PSIA)	<i>FIG 2 FIG 1</i>	<i>119.7</i>	<i>AEW 6504</i>	23	<i>SEP.</i>	<i>None</i>
MODEL NUMBER: <i>CABLE TERMINATION AT VALVES</i> FUNCTION:	Relative Humidity (%)	<i>100</i>	<i>100</i>		23	<i>SEP.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Chemical Spray	<i>2000 ppm 1.14 wt % Boric Acid PH 9-11</i>	<i>2600 ppm B 1.5% wt Boric Acid PH 7.67</i>	<i>T.S. 314.5 314.5.6</i>	22	<i>SIMUL.</i>	<i>None</i>
SERVICE: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>28</i>	<i>204</i>	<i>WCAP 7410-L VOL 1</i>	23	<i>SEP.</i>	<i>None</i>
LOCATION: <i>IN CONTAINMENT</i>	Aging (years)						
FLOOD LEVEL ELEV: <i>61'</i> ABOVE FLOOD LEVEL: <i>NO</i>	Submergence	<i>submerged</i>	<i>FLOODUP Tubes</i>		<i>61</i>	<i>COMBINATION</i>	<i>None</i>

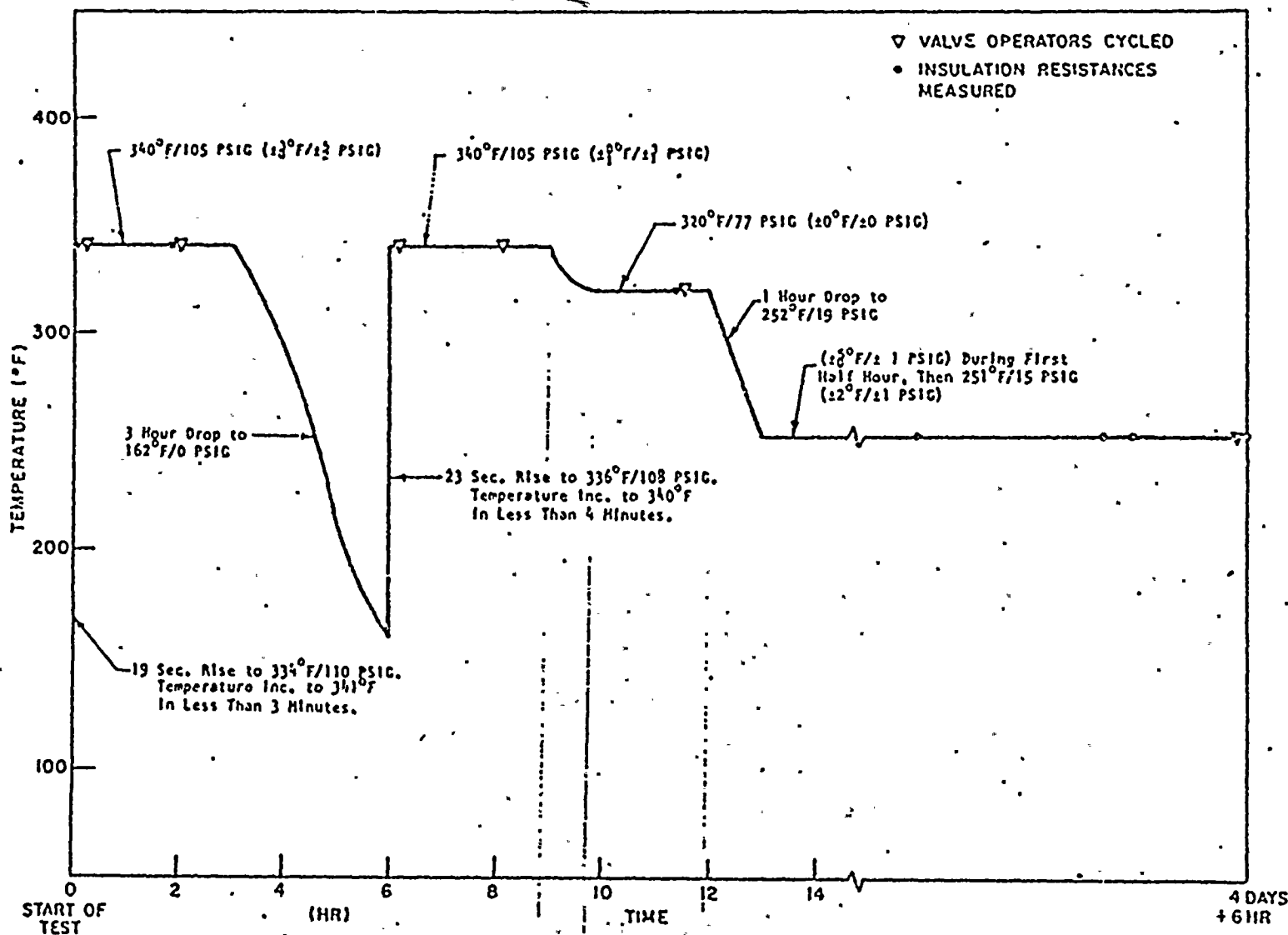
*Documentation References:

22. Limitorgue Corp Test Report #600198
 23. Limitorgue Corp Test Report #600376 A
 61 Floodup Tube Qual. Packet

Notes:

Letters from J. Tillingham (AEP) to K. Knier (NRC) dated 4-14-75 and 9-29-75.

from Ref. 23



F-C3441

Figure 3. Actual Steam Exposure Profile

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 DAY</i>	<i>30 DAYS</i>	<i>24 HRS</i>	<i>16</i>	<i>Seq.</i>	<i>None</i>
PLANT ID NO: <i>N/A</i>	Temperature (°F)	<i>FIG #3.13-1</i>	<i>315</i>	<i>FSAR APP Q</i>	<i>16</i>	<i>SEQ.</i>	<i>None</i>
COMPONENT: <i>CONTROL CABLE TERMINATION</i> MANUFACTURER: <i>N/A</i>	Pressure (PSIA)	<i>FIG 2</i> <i>FIG 1</i>	<i>84.7</i>	<i>APP Q</i> <i>6504</i>	<i>16</i>	<i>SEQ.</i>	<i>None</i>
MODEL NUMBER: <i>CABLE TERMINATION AT VALVES</i> FUNCTION:	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>16</i>	<i>SEQ.</i>	<i>None</i>
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Chemical Spray	<i>2000 ppm B</i> <i>1.14 wt % Boric</i> <i>ph 9-11 Acid</i>	<i>3000 ppm B</i> <i>1.72 wt % Boric</i> <i>ph 10.5 Acid</i>	<i>T.S.</i> <i>314.5</i> <i>314.5.6</i>	<i>16</i>	<i>SEQ.</i>	<i>None</i>
SERVICE: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>28</i>	<i>204</i>	<i>WCAP</i> <i>7410-L</i> <i>Vol 1</i>	<i>16</i>	<i>SEQ.</i>	<i>None</i>
LOCATION: <i>In Containment</i>	Aging (years)						
FLOOD LEVEL ELEV: <i>612</i> ABOVE FLOOD LEVEL: <i>NO</i>	Submergence	<i>submerged</i>	<i>FLOODUP Tubes</i>		<i>61</i>	<i>Combination</i>	<i>None</i>

*Documentation References:

16. Limitorgue Corp Test Report #600456
61. FLOODUP TO BE Qual. Packet

Notes: Letters of J. Tullough (MEP) to K. Knud (NRC)
of 4-14-75 and 9-29-75.



from Ref. 16

Specified Accident Profile

Temperature :
°F

Take Insulation
readings and operate
Valve Control

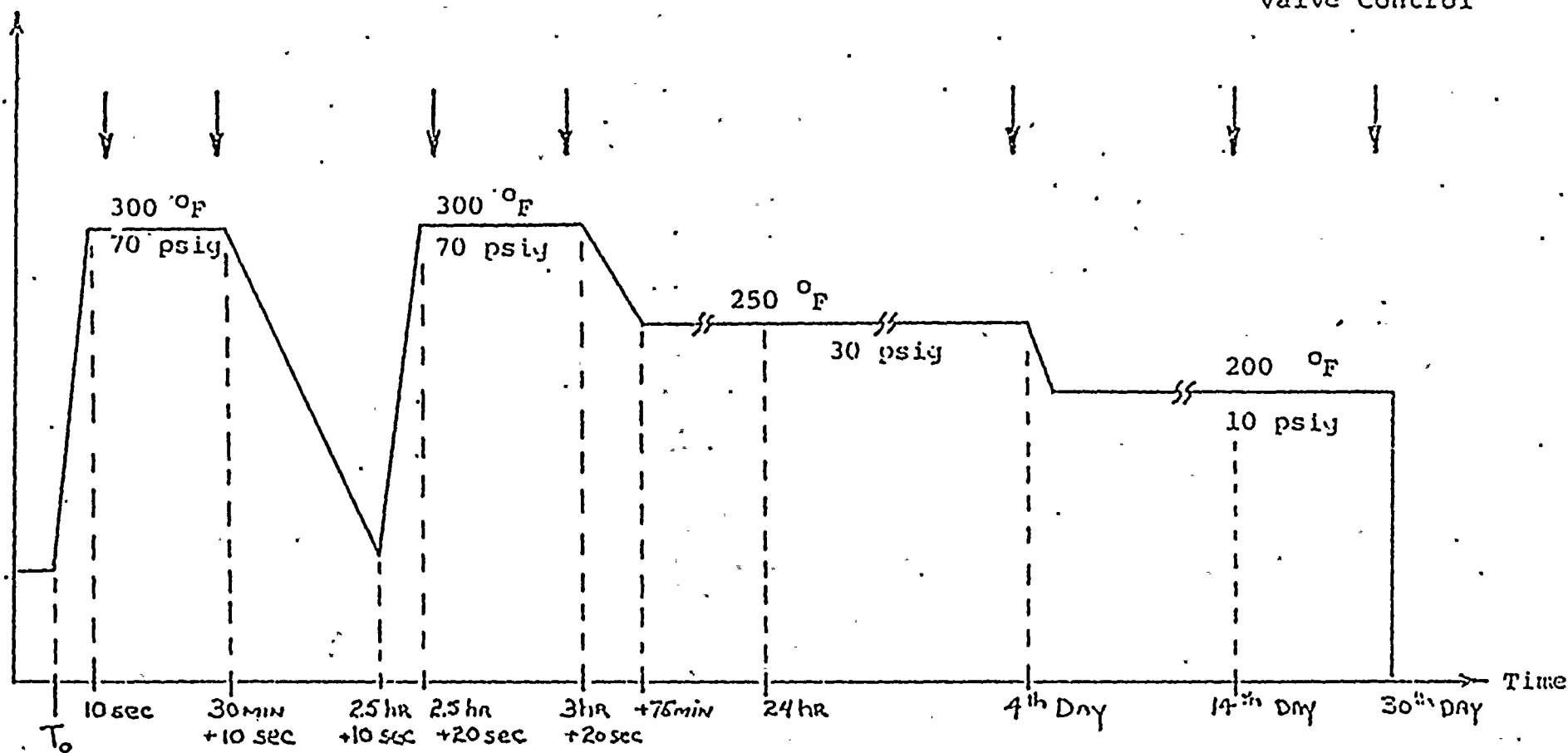
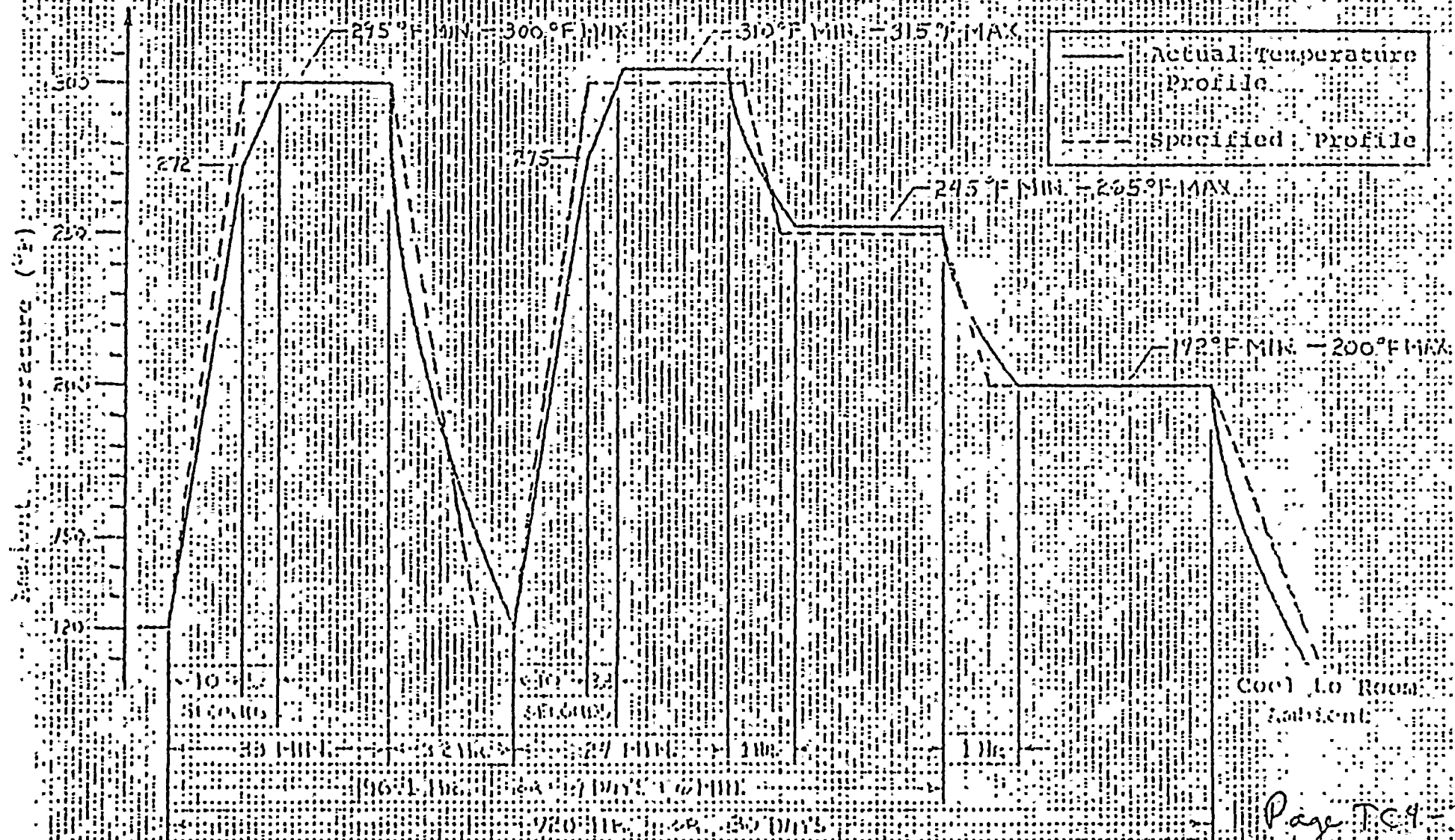


Figure 5

ACTUAL ACCIDENT PROFILE

from Ref. 16



SHEET TC-5 INTENTIONALLY OMITTED

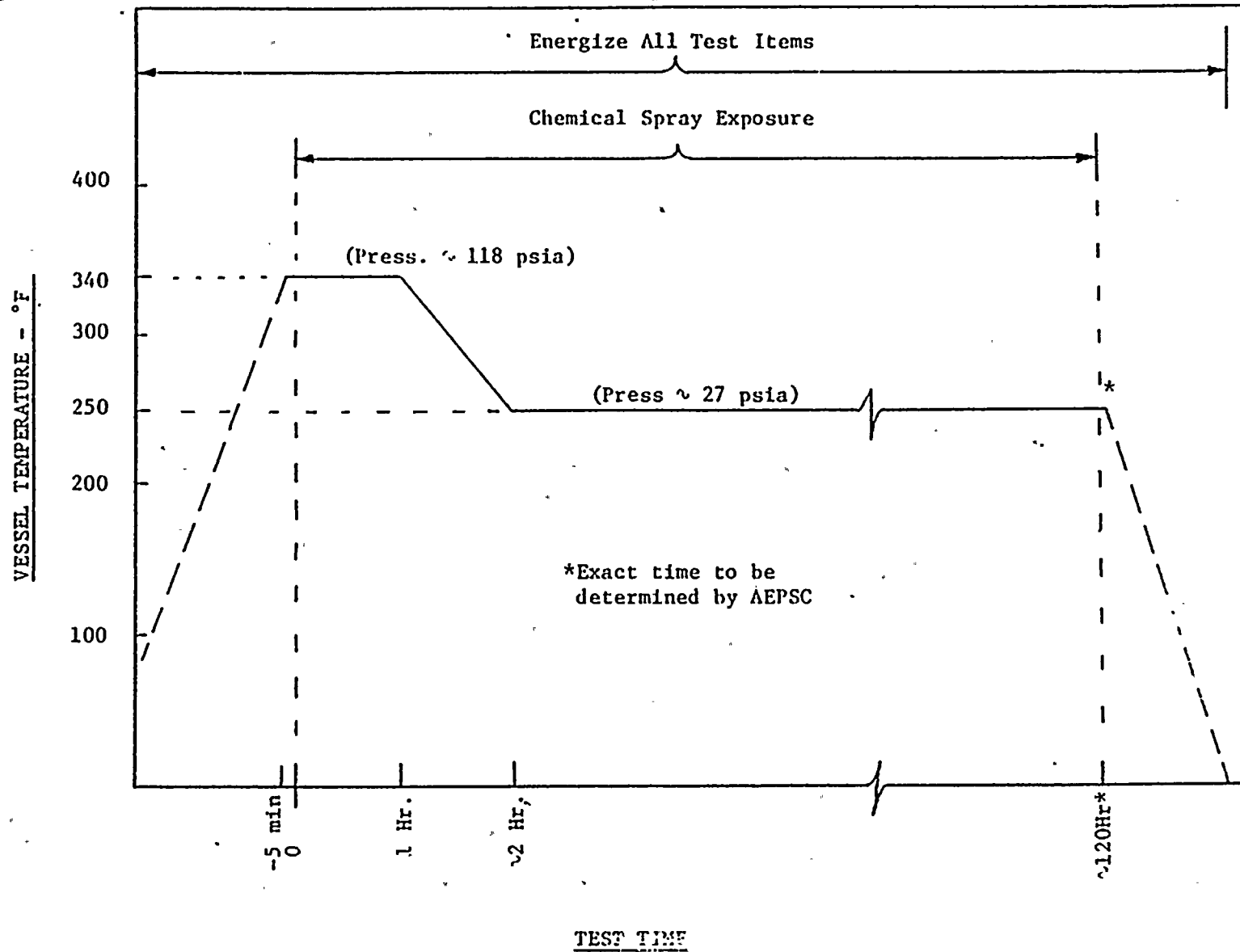
EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS PLANT ID NO: N/A COMPONENT: CONTROL CABLE TERMINATION MANUFACTURER: N/A MODEL NUMBER: SOLID KAPTON SPLICED TO STRANDED KAPTON FUNCTION: TERM. AT PENETRATOR INSIDE FLOODUP TUBES ACCURACY: SPEC: N/A DEMON: N/A SERVICE: VARIOUS LOCATION: In Containment FLOOD LEVEL ELEV: 61 ABOVE FLOOD LEVEL: NO	Operating Time	24 HRS.	116 HRS.	Table 2.5-2	13	Seq.	None
	Temperature (°F)	F14 022.9-1,2	340	FSAR App Q	13	Seq.	None
	Pressure (PSIA)	F142 F141	118	AEW 6504	13	Seq.	None
	Relative Humidity (%)	100	100		13	Seq.	None
	Chemical Spray	Not Req'd	2500 ppm B. 1.43 wt % Boric PH 9.5 Acid	T.S. 314.5 314.8.6	13	Seq.	None
	Radiation (10 ⁶ rads)	2.8	60	101.7 ALW 729	13	Seq.	None
	Aging (years)						
	Submergence	submerged	Floodup Tubes		61	Combination	None

*Documentation References:

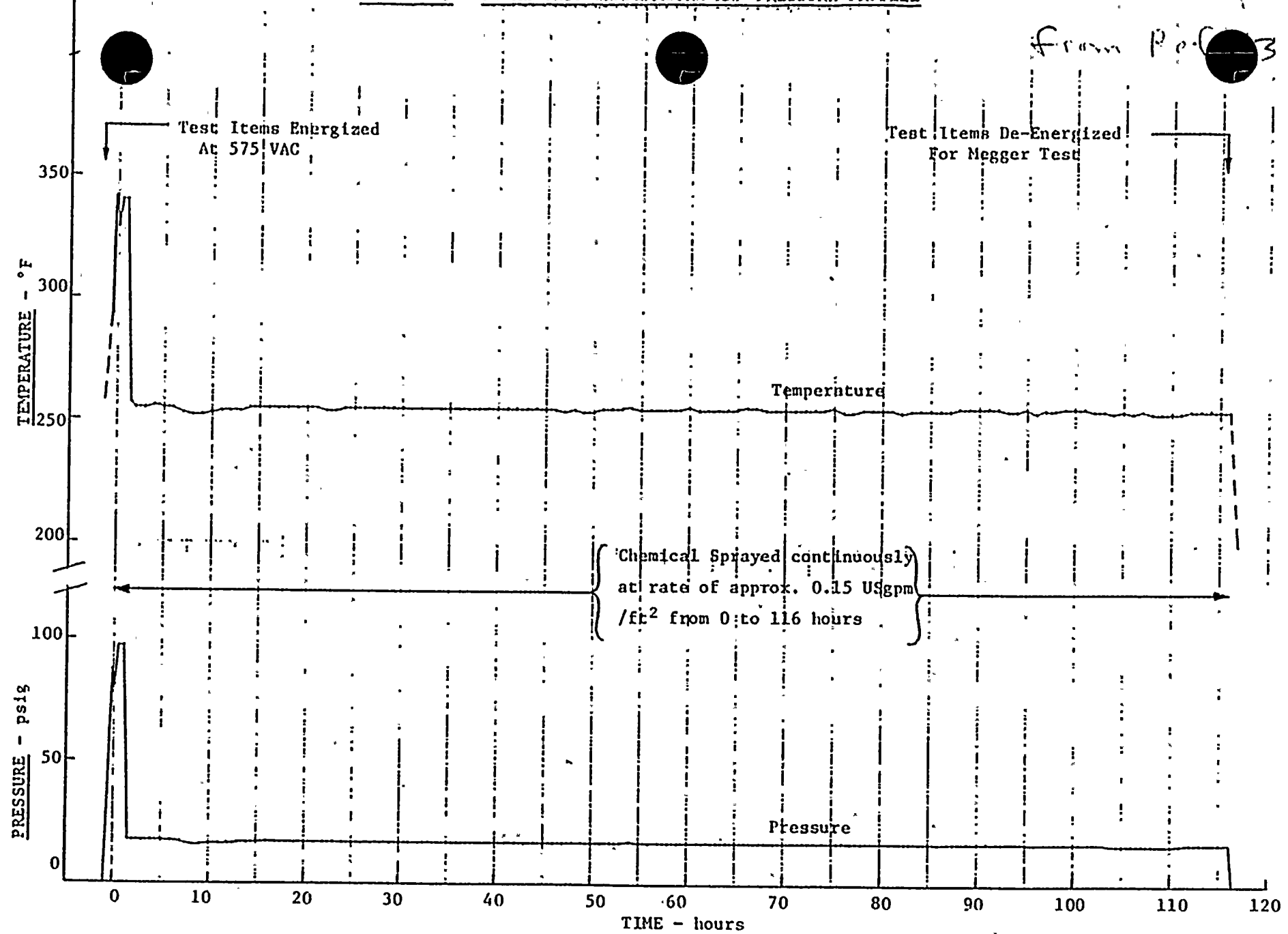
Notes:

13. Westinghouse-CANADA Test Report CWAPD-382

61. Floodup Tube Qual: Packet



From P.C. 3



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	24 HRS	116 HRS	Table 7.5-2	8	Seq.	None
PLANT ID NO: N/A	Temperature (°F)	FIG 0229-1,2	345	FSAR App Q	8	Seq.	None
COMPONENT: CONTROL CABLE TERMINATION	Pressure (PSIA)	FIG 2, FIG 1	124.7	AERO 6504	8	Seq.	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100		14	Simul.	None
MODEL NUMBER: STRANDED KAPTON SPIRAL TO SOLID XL POLYETHYLENE	Chemical Spray	2000 ppm 1,19wt% BORIC 1H9-11 Acid	2500 ppm 1,43wt% BORIC PH9-10 Acid	T.S. 314.5 314.56	8	Seq.	None
FUNCTION: Term at Floodup Term Box	Radiation (10 ⁶ rads)	28	150	WEAP 7410-L VOL I	8	Seq.	None
ACCURACY: SPEC: N/A DEMON: N/A	Aging (years)	"					
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: In Containment							
FLOOD LEVEL ELEV: -612'							
ABOVE FLOOD LEVEL: Yes							

57-60
82-83
87-88
92A
111-112
202-203
214
226-228

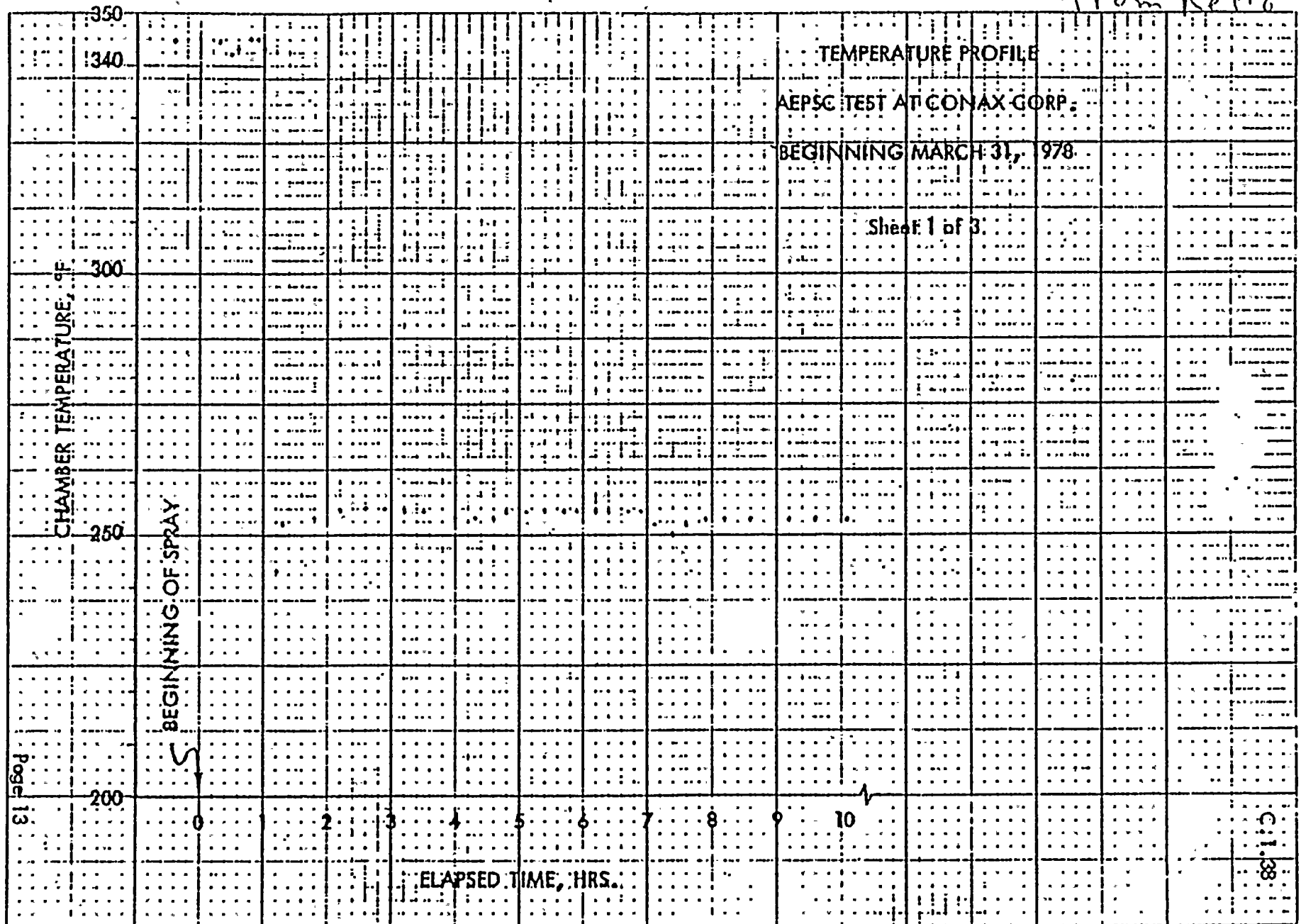
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Notes:

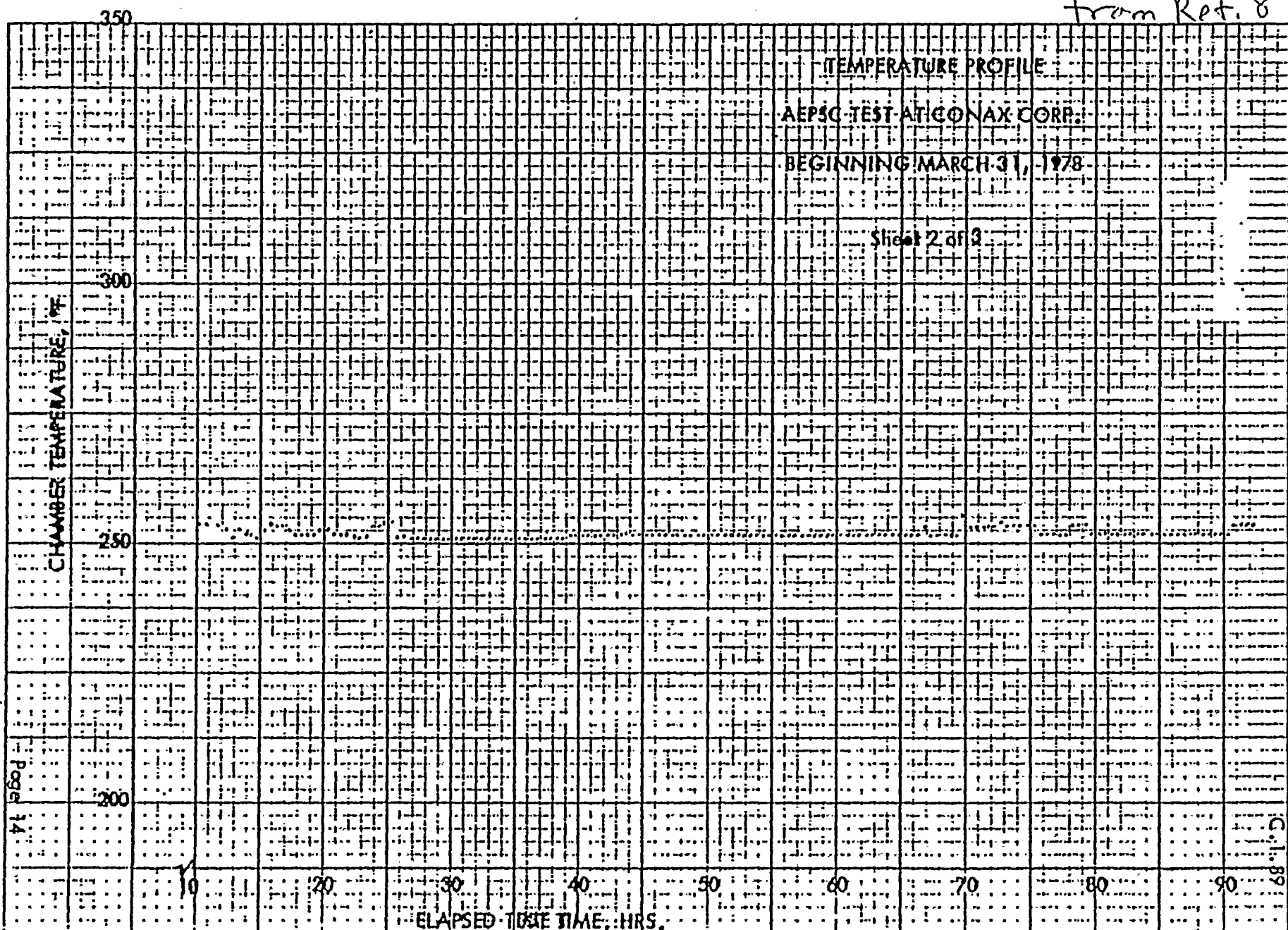
8. CONAX Corp. Test Report IPS-348

14. FIRC Test Report F-C 4033-3

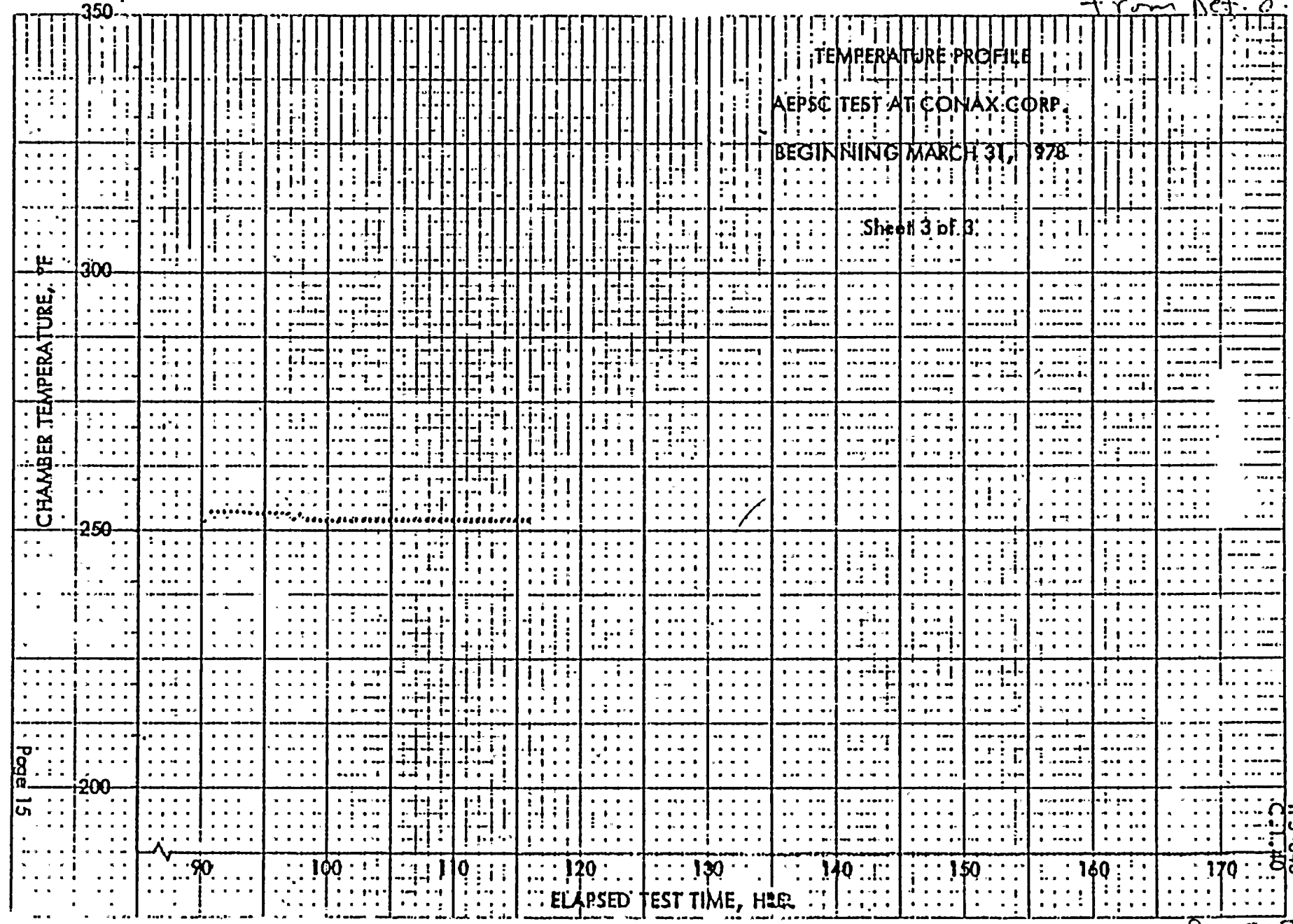
from Ret. 8



from Ref. 8



from Ref. 8.



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	24 HRS	116 HRS	Table 7.5-2	8	Seq.	None
PLANT ID NO: N/A	Temperature (°F)	Fig 012.9-1, -2	345	FSAR APP Q	8	Seq.	None
COMPONENT: CABLE TERMINATION	Pressure (PSIA)	Fig 2 Fig 1	124.7	AEW 6504	8	Seq.	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100		14	Simul.	None
MODEL NUMBER: XL Polyethylene said spliced to XL Polyethylene	Chemical Spray	2000 ppm B 1/11 wt % Boaric Ph 9-11 Acid	2500 ppm B 1.43 wt % Boaric Ph 9-10 Acid	T.S. 3/4.5 3/4.6	8	Seq.	None
FUNCTION: Term or Term Box at Valve Actuator	Radiation (10 ⁶ rads)	28	150	CWAP 7410-L VOL I	8	Seq.	None
ACCURACY: SPEC: N/A DEMON: N/A	Aging (years)				4		
SERVICE: VARIOUS	Submergence	NA	NA	NA NA		NA	NA
LOCATION: In Containment							
FLOOD LEVEL ELEV: 612' ABOVE FLOOD LEVEL: Yes							

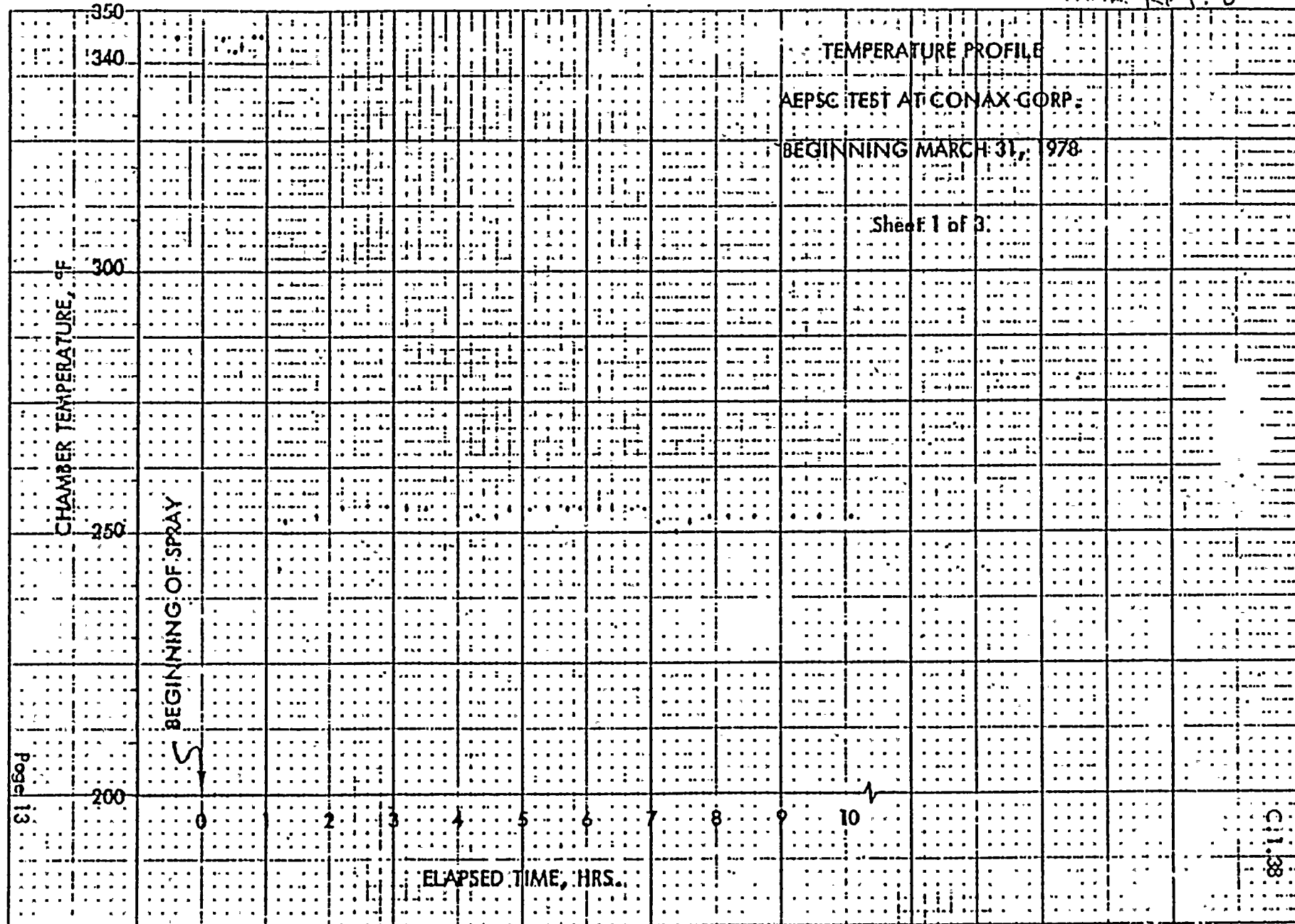
*Documentation References:

Notes:

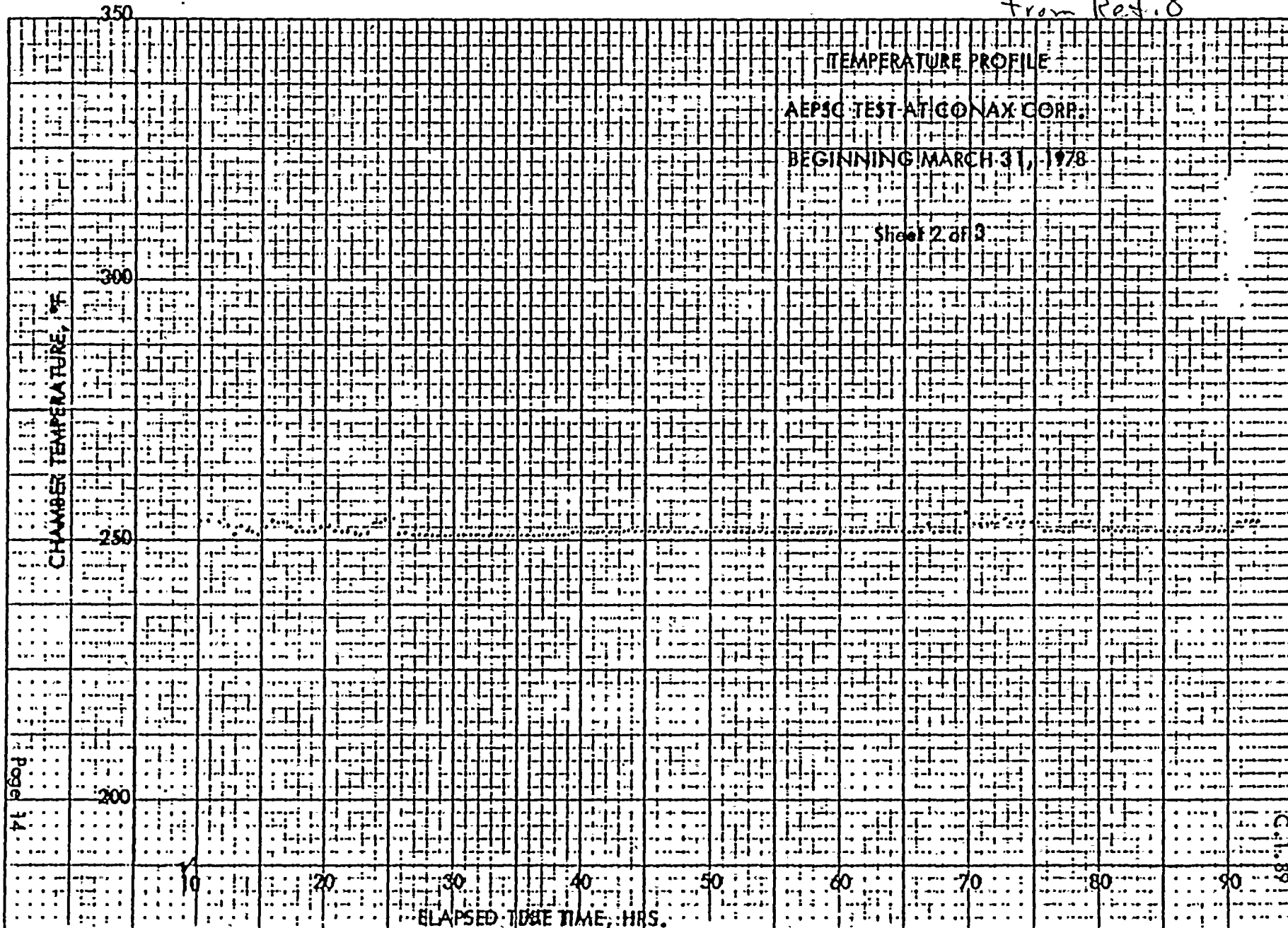
8. CONAX Corp. Test Report IPS-348

14. FIRC Test Report F-C4033-3

from Ref. 8.

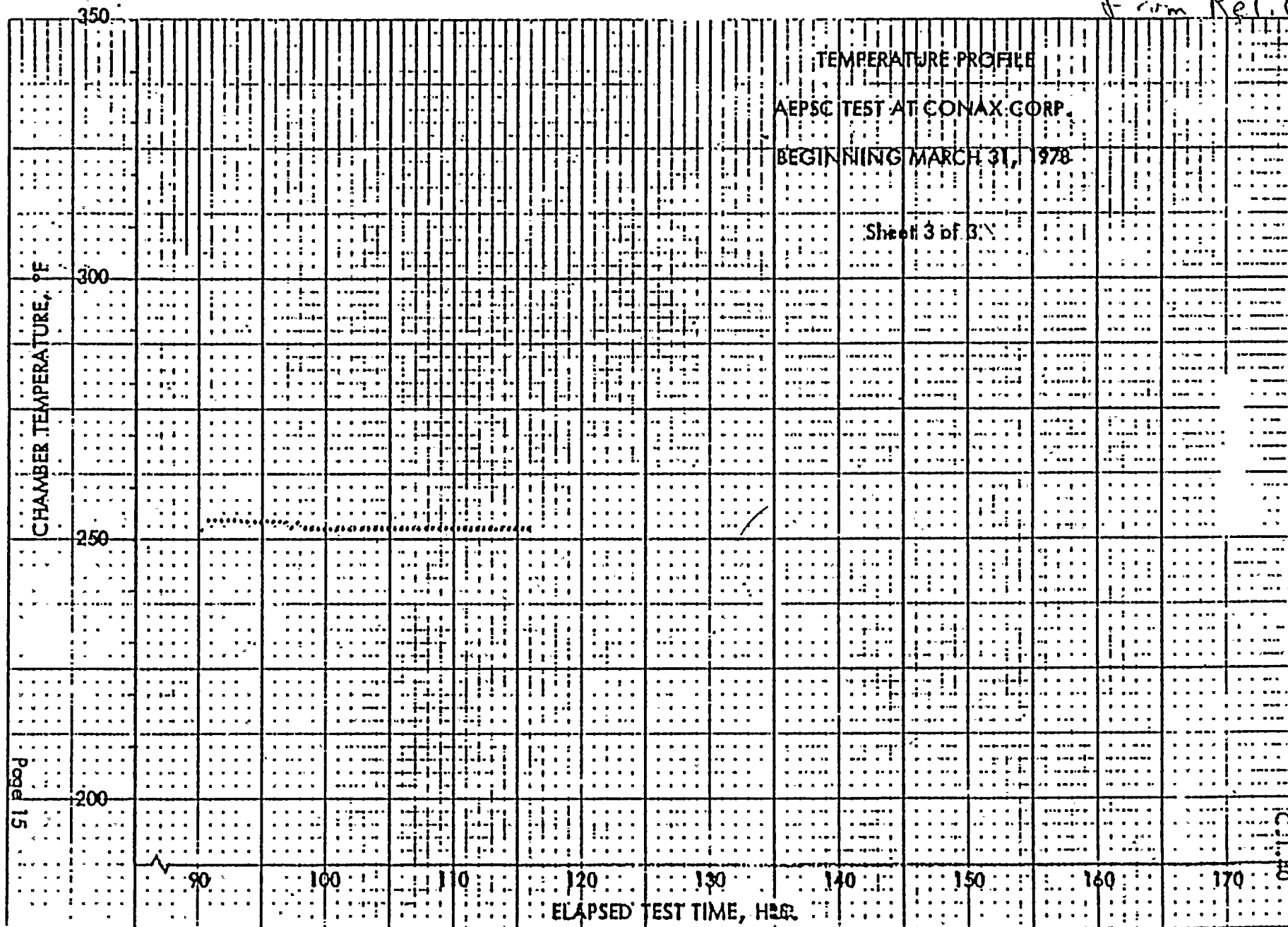


from Ref. 8





Form Re 1.8





EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	> 11 DAYS	Note A below	63 44	Combination	None
PLANT ID NO: VARIOUS	Temperature (°F)	Fig. 0.27	212	FSAR APP O	* 44	Seq.	None
COMPONENT: CONTROL CABLE TERMINATION MANUFACTURER: N/A	Pressure (PSIA)	Fig 0-27	14.7	FSAR APP O	44	Seq	None
MODEL NUMBER: TERM. AT VALVE MOTOR OPERATOR FUNCTION: VARIOUS	Relative Humidity (%)	NA	100		44	Seq.	None
ACCURACY: SPEC: N/A DEMON: N/A	Chemical Spray	NA	NA	NA	NA	NA	NA
SERVICE: VARIOUS	Radiation (10 ⁶ rads)	4.1	See Note 1 on Valve Motor Oper.	NEPSC NS86 DE-N-6420-2			See Note 1 on Valve Motor Operators
LOCATION: Outside Containment	Aging (years)						
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Submergence	NA	NA	NA	NA	NA	NA

*Documentation References:

44. FIRC Test Report F-C3271
63. Req'd Time Qual. Analysis

Notes:

* See Note 2 on Cable Terminations
A) Letters from J. Tillinghast (NEP) to K. Kniel (NRC)
dated 4-14-75 & 9-29-75.

44.

be inserted in place of pg TC9-2 of Attachment 6 to AEP:INCC:00356A

THE FLUENT INSTITUTE RESEARCH LABORATORIES

Page: TC9-2

3-6

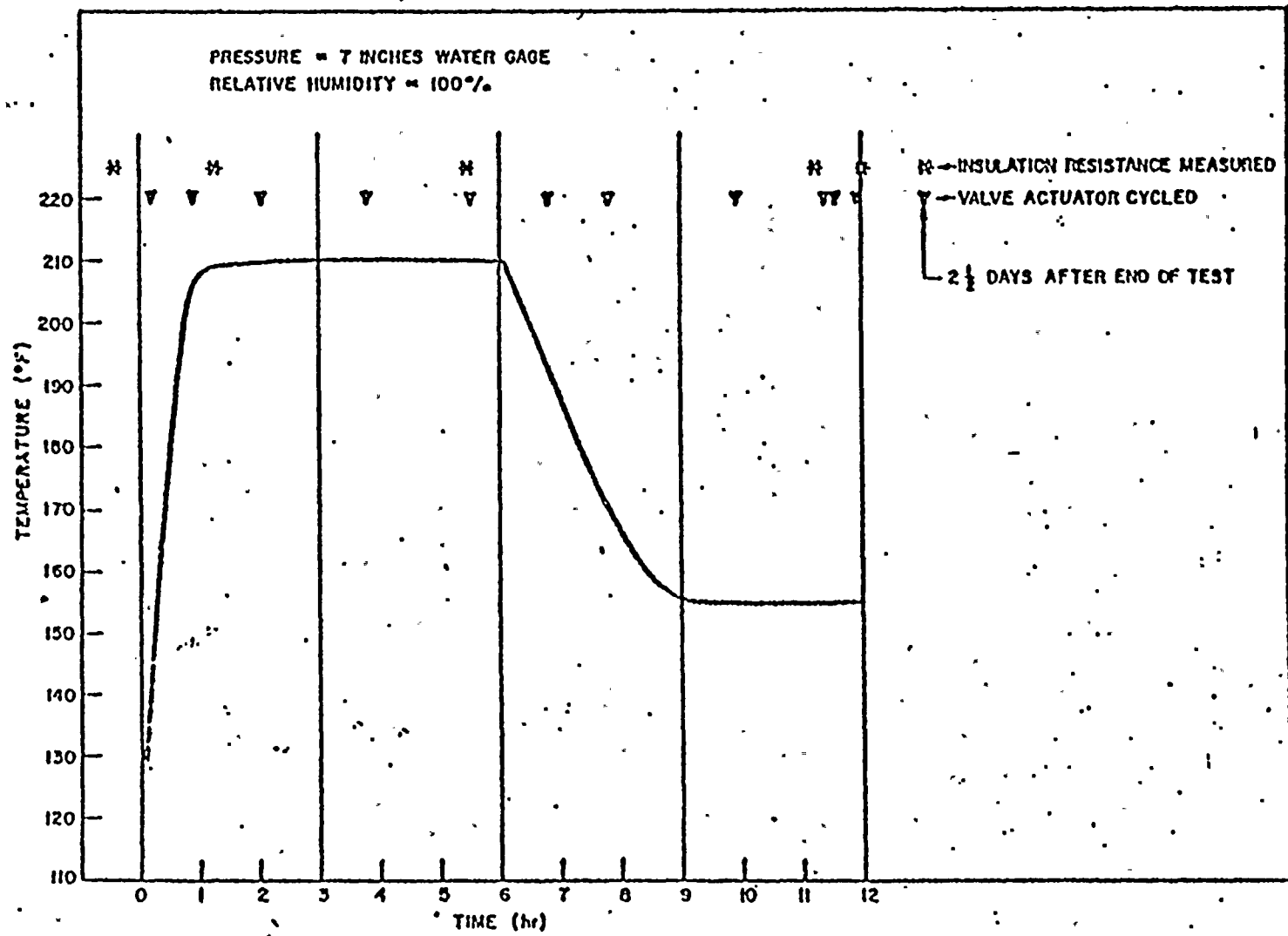


Figure 3. Test Profile



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	30 DAYS	Table 7.5.2 FSAR	23	Sep	None
PLANT ID NO: VARIOUS	Temperature (°F)	Fig 0-27	340	FSAR APP.0	23	Sep.	None
COMPONENT: CONTROL CABLE TERMINATION/ MANUFACTURER: N/A	Pressure (PSIA)	Fig 0-27	119.7	FSAR APP.0	23	Sep	None
MODEL NUMBER: VARIOUS	Relative Humidity (%)	NA	100	NA	23	Sep	None
FUNCTION: Telem AT valve motor Operator	Chemical Spray	NA	2600 ppm 1.5% H ₂ O 24.67 ppm	NA	22	Simul.	None
ACCURACY: SPEC: N/A DEMON: N/A	Radiation (10 ⁶ rads)	16.6	204	See Note A	23	Sep.	None
SERVICE: VARIOUS	Aging (years)						
LOCATION: Outside Containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Submergence	NA	NA	NA	NA	NA	NA

T.D. 200.
0.4 FSAR
Page
59-90
101-108

*Documentation References:

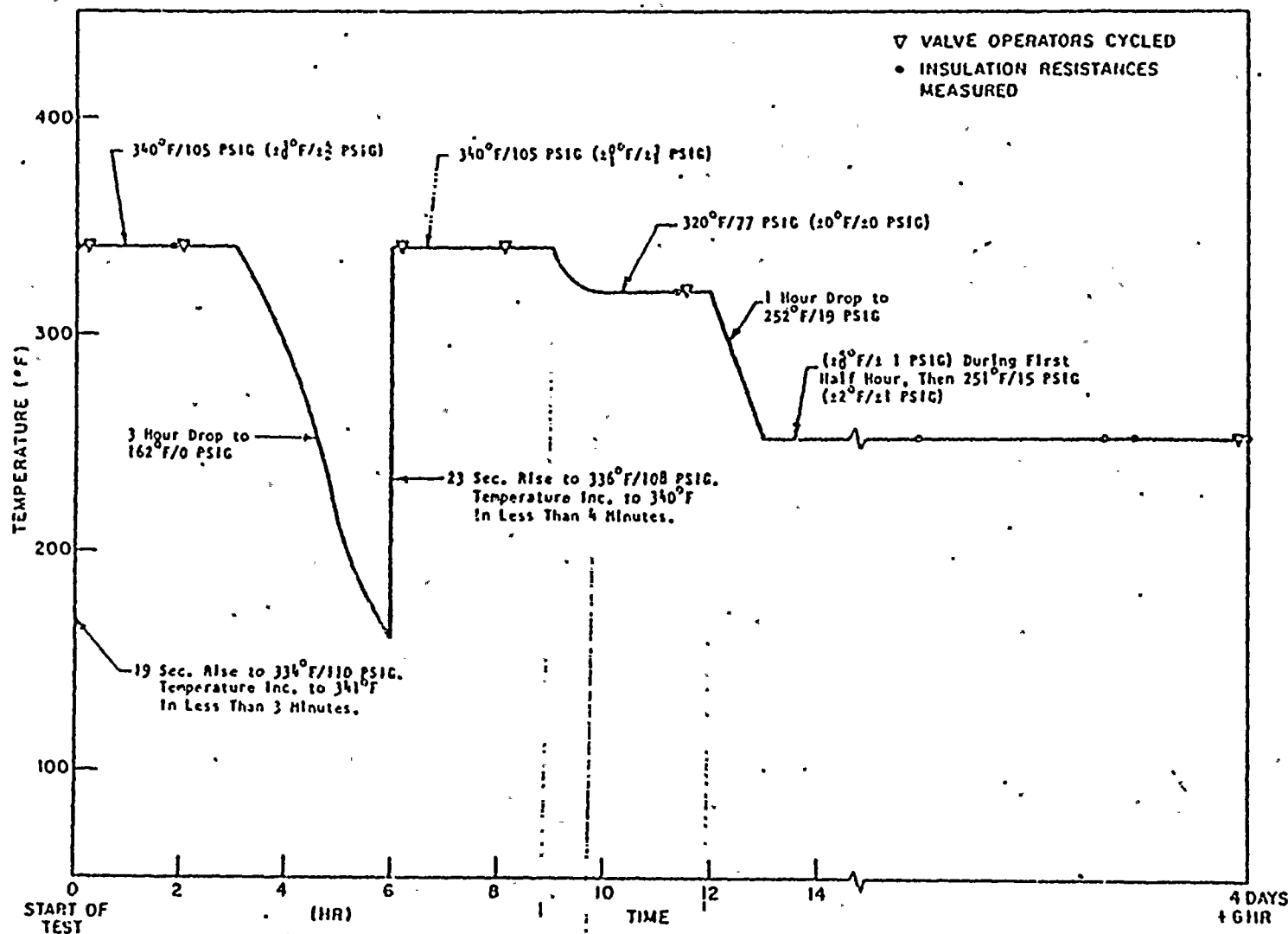
22. Limit torque test Report # 600198
23. Limit torque test Report # 600376A

Notes:

A. AEPSC NSHL calculation DC-N-6420-2 (Ref 59)



from Ref. 23



F-C3441

Figure 3. Actual Steam Exposure Profile

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 DAY	16 DAYS	Table 1.5-2 FSAR	24	Seq.	None
PLANT ID NO: NA	Temperature (°F)	Fig 0.27	250	FSAR App. 0	24	Seq.	None
COMPONENT: Control Cable Termination	Pressure (PSIA)	Fig 0.27	39.7	FSAR App. 0	24	Seq.	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100		24	Seq.	None
MODEL NUMBER: TERM. AT VALVE MOTOR	Chemical Spray	NA	NA	NA	NA	NA	None
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	16.6	204	See note A	24	Seq.	None
ACCURACY: SPEC: N/A DEMON: N/A	Aging (years)						
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: Outside Containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA							

*Documentation References:

24. Limit torque test Report #600461

Notes:

A) AEPSC NS&L calculation DC-D-6420-2 (Ref 59)



TEMPERATURE PROFILE

From Ref. 24

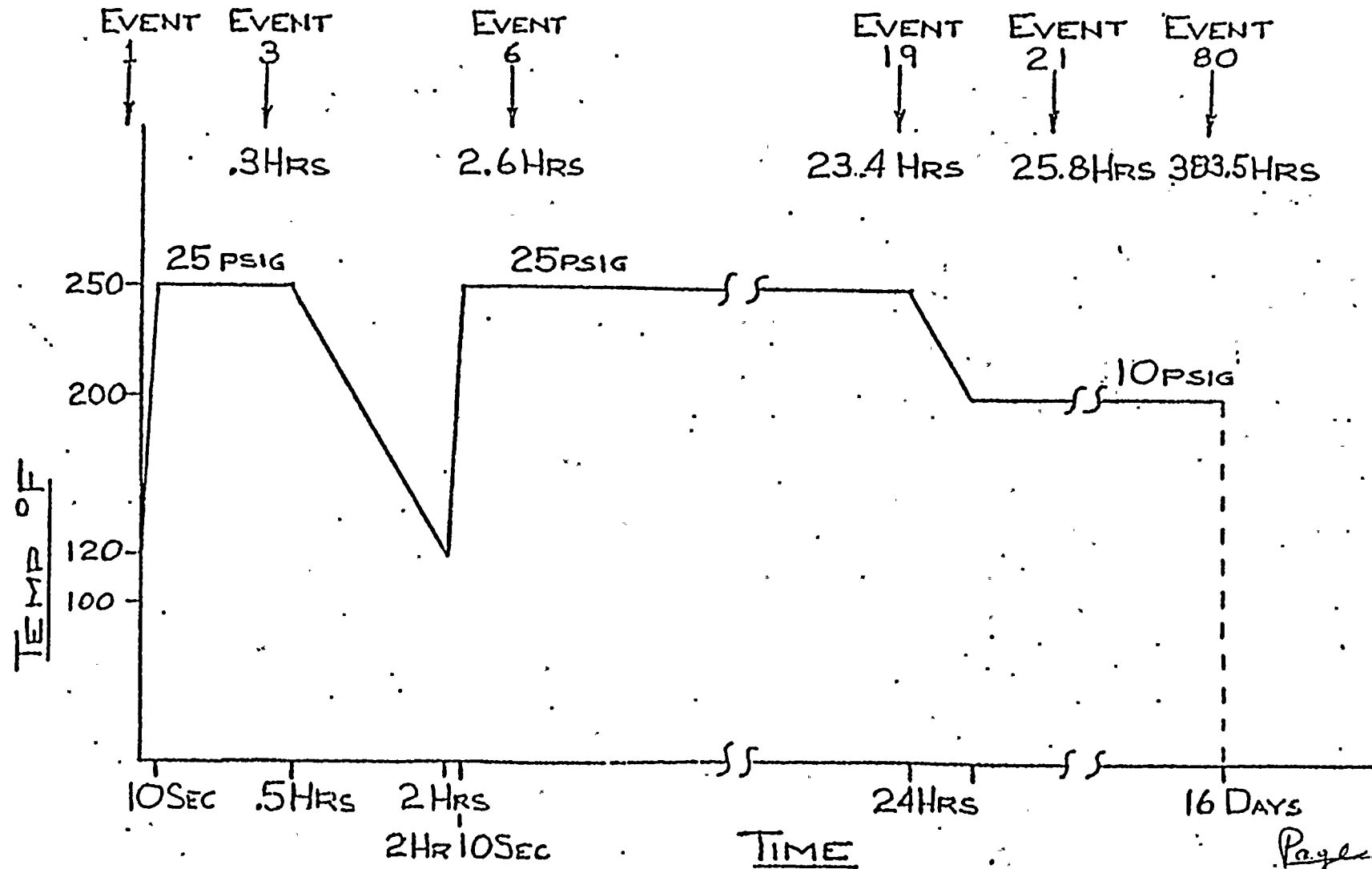


FIGURE 1

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Pressurizer	Operating Time	1 DAY	16 DAYS	Table 7.5.2	24	Seq.	None
PLANT ID NO: N/AO-151, 152, 153	Temperature (°F)	Fig 022.9-1, -2	250	FSAR APP Q1	24	Seq.	None
COMPONENT: CONTROL CABLE TERM.	Pressure (PSIA)	FIG 1 FIG 2	39.7	AEO 6004	24	Seq.	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100	-	24	Seq.	None
MODEL NUMBER: TERM. AT VALVE MOTOR OPERATION	Chemical Spray	See Note A	NA	See Note B	NA	NA	None
FUNCTION: Per relief block valves	Radiation (10 ⁶ rads)	28	204	WCAP 110-4 Vol. 1	24	Seq.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)	1					
SERVICE: Per relief line	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: INSIDE CONTAINMENT							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: Yes							

*Documentation References:

24. Limitorque Corp. Test Report #600461

Notes:

A) Valve location is not subjected to direct caustic spray impingement.

B) mech installation drawings

1-5435

1-5435A

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TEMPERATURE PROFILE

from Ref. 24

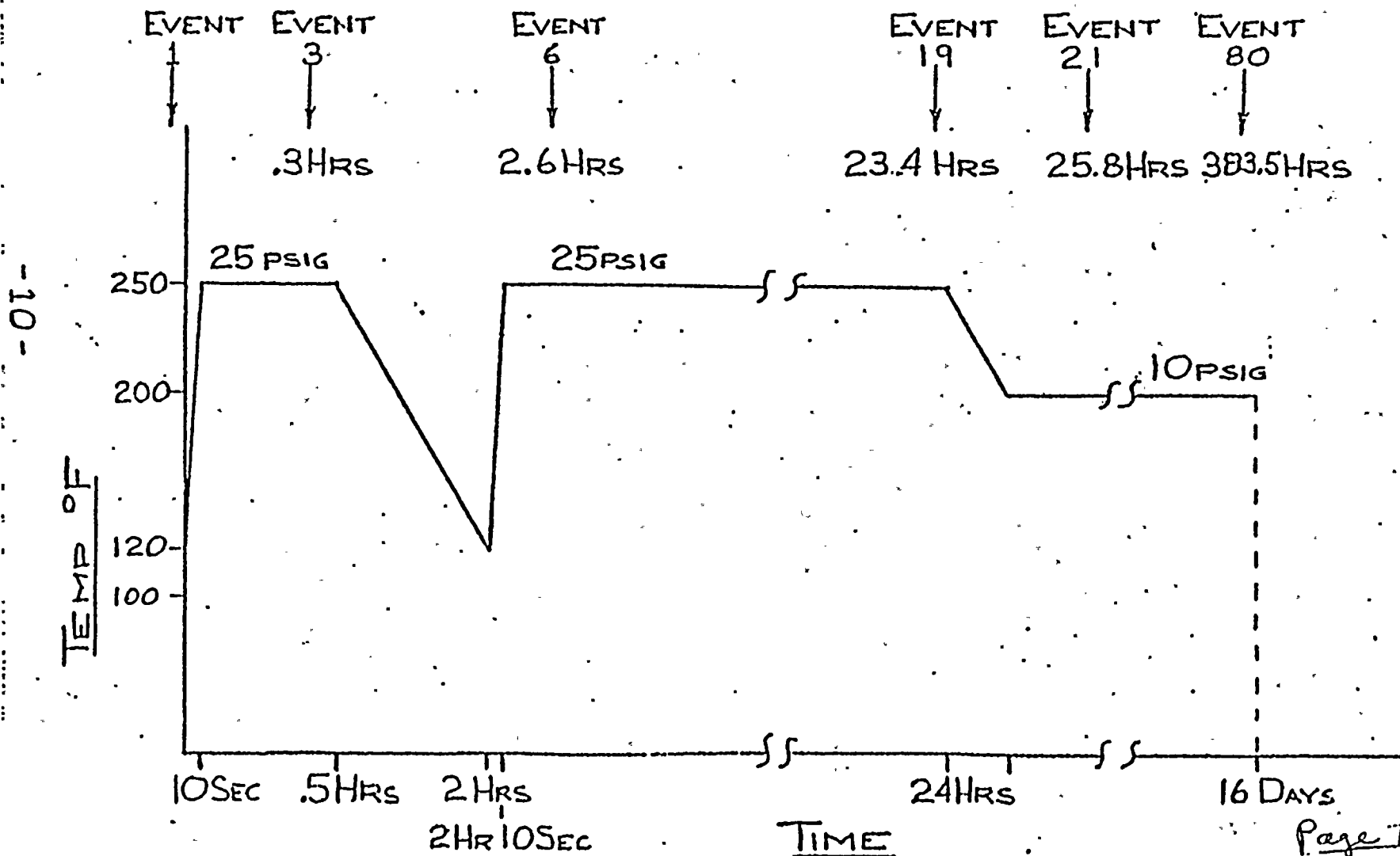


FIGURE 1



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	24 HRS	116 HRS	File 7.5-2 FSAR	45	Simul.	None
PLANT ID NO: N/A	Temperature (°F)	Fig 0-27	345	FSAR App. 0	45	Simul.	None
COMPONENT: CABLE TERMINATION	Pressure (PSIA)	Fig 0-27	124.7	FSAR App. 0	45	Simul.	None
MANUFACTURER: N/A	Relative Humidity (%)	NA	100%	NA	45	Simul.	None
MODEL NUMBER: TERM AT TERM. BLOCK	Chemical Spray	NA	2500 ppm B 1.43 wt % Base PH 9-10 Acid	NA	45	Simul.	None
FUNCTION: CABLE CONNECTION	Radiation (10 ⁶ rads)	16.6	20	See Note A	46	Seq.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS							
LOCATION: Outside Cont.							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA	Submergence	NA	NA	NA	NA	NA	NA

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*Documentation References:

45. Conax Test Report IPS-339
46. Conax Test Report IPS-349

Notes:

- A) AEPSC NS+L calculation DC-10-6420-2 (Ref. 59)

from Ref. 45



FIGURE 6.1

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: RHR	Operating Time	1 DAY	7 DAYS	Note A b/w	22	Simul.	None
PLANT ID NO: ICM-305, -306,	Temperature (°F)	Fig. 022.9-1, -2	330	FSAR MAP Q	22	Simul	None
COMPONENT: Control Cable Termination	Pressure (PSIA)	Fig 1 Fig 2	104.7	ASD 604	22	Simul.	None
MANUFACTURER: NA	Relative Humidity (%)	100	100		22	Simul.	None
MODEL NUMBER: Cable Term at Value	Chemical Spray	NA	2500 ppm B, 1.439 out Basic PH 7.67 Acid	INSIDE CT EXTENSION	22	Simul.	None
FUNCTION: Long term post-accident cooling	Radiation (10 ⁶ rads)	<4.6	100	NEP NSF CALCUL. DIN - 10420-L	1	SEQ. II	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: RECIRCULATION	Submergence	submerged	Floodup Tubes		61	Combination	None
LOCATION: In Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: No							

*Documentation References:

22. Limiting Corp Test Report # 600198.
1. Convey Corp. Test Report IPS-234.
61. Floodup Tube Study

Notes: (A) Letter from J. Tillinghast (AEP) to K. Knutson dated 4-14-75 & 9-29-75.

;; !!

from Ref. 22. Qualified by Limitorque Corp. Test Laboratory
Project #600198. November 1968

Type of Test: simultaneous, steam
chemical spray
separate seismic test

Type Profile:

328°F, 90 psig for 1 hr
312°F, 70 psig for 2 hrs
287°F, 40 psig for 2 hrs
271°F, 20 psig for 19 hrs
250°F, 15 psig for 6 days

Chemical Spray:

1.5% boric acid buffered with Na OH to a PH of 7.6%.

Seismic Test 8/20/79

Horizontal Force, 5.3 G at 35 Hz
Vertical force 5.3 G at 35 Hz
No resonance freq from 5 to 35 Hz



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	5 sec	> 1 hr	14.2.5	SAFE note below	Engineering Review	NONE
PLANT ID NO: NA	Temperature (°F)	F19 0-27	150	FSAR APP	MFIR LIT	Eng'g Review	NONE (L)
COMPONENT: CABLE TERM	Pressure (PSIA)	F19 0-27	14.7	FSAR APP	"	Eng'g Review	NONE (L)
MANUFACTURER: NA	Relative Humidity (%)	NA	NA	NA	NA	NA	NA
MODEL NUMBER: Control Cable Term At Solenoid	Chemical Spray	NA	NA	NA	NA	NA	NA
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	NA	NA	NA	NA	NA	NA
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: Out Containment							
FLOOD LEVEL ELEV: NA ABOVE FLOOD LEVEL: NA							

*Documentation References:

MFIR LIT - AUTOMATIC SWITCH CO. CATALOG NO 30
BULLETIN 1316

Notes: 14.2.5 & 14.2.8 ARE THE ADVERSE ENVIRONMENT

ACCIDENT ANALYSIS FOR WHICH CREDIT IS ASSUMED FOR OPERATION OF THE DEVICE.

(L) ACCIDENT ANALYSIS Q212.25 SHOWS THAT MAIN STEAM LINE BREAK PLUS THE FAILURE OF ANOTHER STEAM LINE TO ISOLATE IS ACCEPTABLE. SINCE THE LOCATION OF THESE DEVICES IS SUCH THAT ONLY TWO STEAM GENERATOR STOP VALVES CAN BE AFFECTED BY ONE BREAK, USE OF CONTROL GRAB DEVICES IS ACCEPTABLE.

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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>5 sec</i>	<i>> 1 hr</i>	<i>Q</i> 27.4	<i>29</i>	<i>Sequential</i>	<i>NONE</i>
PLANT ID NO: <i>NA</i>	Temperature (°F)	<i>Fig 022.9-1,-2</i>	<i>346</i>	<i>FSAR APP Q</i>	<i>REF. 29</i>	<i>SEQUENTIAL</i>	<i>NONE</i>
COMPONENT: <i>CABLE TERM</i>	Pressure (PSIA)	<i>Fig 1 Fig 2</i>	<i>110</i>	<i>AED 6504</i>	<i>"</i>	<i>"</i>	<i>"</i>
MANUFACTURER: <i>NA</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>	<i>7.5</i>	<i>"</i>	<i>"</i>	<i>"</i>
MODEL NUMBER: <i>CONTROL CABLE TERM AT SOLENOID</i>	Chemical Spray	<i>2000 ppm B-11.4 wt % Boric Acid PH=9-11</i>	<i>3000 ppm Boric Acid w/.064 M Na₂S₂O₃</i>	<i>T.S. 3/4.5 3/4.65</i>	<i>"</i>	<i>"</i>	<i>"</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>< 1</i>	<i>150</i>	<i>SCAP 7410-L Vol. 1</i>	<i>"</i>	<i>"</i>	<i>"</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)				<i>"</i>	<i>"</i>	<i>"</i>
SERVICE: <i>VARIOUS</i>							
LOCATION: <i>IN CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>YES</i>	Submergence	<i>NA</i>	<i>NA</i>		<i>AEP DWG</i>	<i>ENGINEERING DRAWING REVIEW</i>	<i>"</i>

T. J. NO.
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226-228

*Documentation References: UNLESS OTHERWISE STATED
REFERENCES ARE FSAR SECTIONS

Notes:

REF 29 - AUTOMATIC SWITCH CO. REPORT AQS 21478/TR

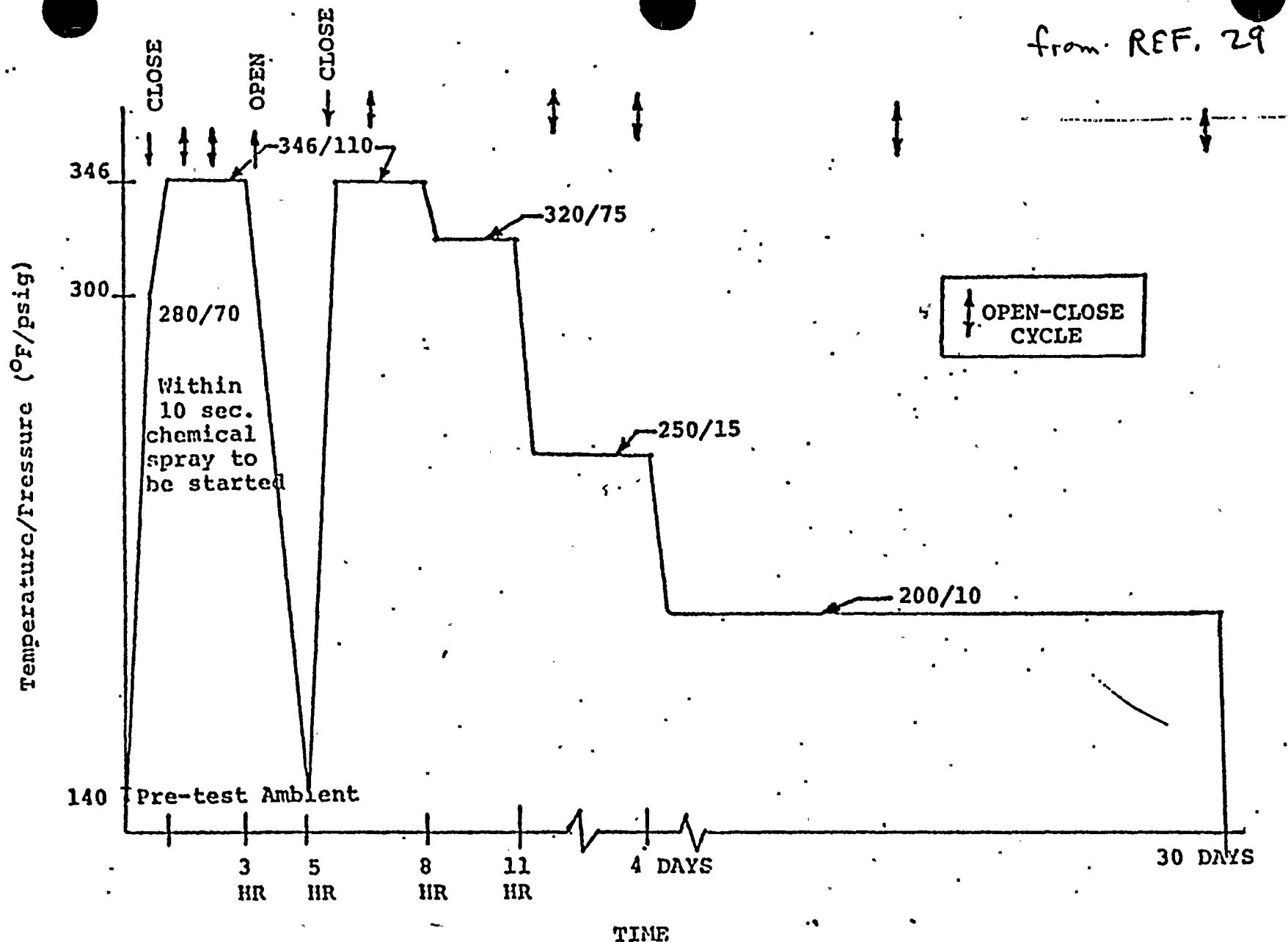


FIGURE 1
LOCA SIMULATION BY ENVIRONMENTAL
EXPOSURE (STEAM/CHEMICAL)

Temperature/Pressure Profile for simulation of loss-of coolant accident (LOCA) design basis event (DBE) by steam/chemical-spray environmental exposure.

Page TC 16-2

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	4 mo.	7 1/4 mo.	Table 7.5-2	63 62	Combination	None
PLANT ID NO: N/A	Temperature (°F)	FIG 022.9-1, -2	340	FSAR APP Q	62	Combination	None
COMPONENT: INSTRUMENTATION TERMINATION	Pressure (PSIA)	FIG 2 FIG 1	119.7	AEW 6504	62	Combination	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100		62	Combination	None
MODEL NUMBER: BARTON INSTRUMENT TERMINATION	Chemical Spray	2000 ppm B 1.14 wt % Boric pH 9-11 Acid	2000 ppm B 1.14 wt % Boric pH 9-11 Acid	T.S. 314.5 314.5.6	62	Combination	None
FUNCTION:	Radiation (10 ⁶ rads)	95	150	WCAP 7410-L VOL I	62	Combination	None
ACCURACY: SPEC: N/A DEMON: N/A	Aging (years)	11	1				
SERVICE: VARIOUS	Submergence	submerged	Yes		62	Combination	None
LOCATION: IN Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: No							

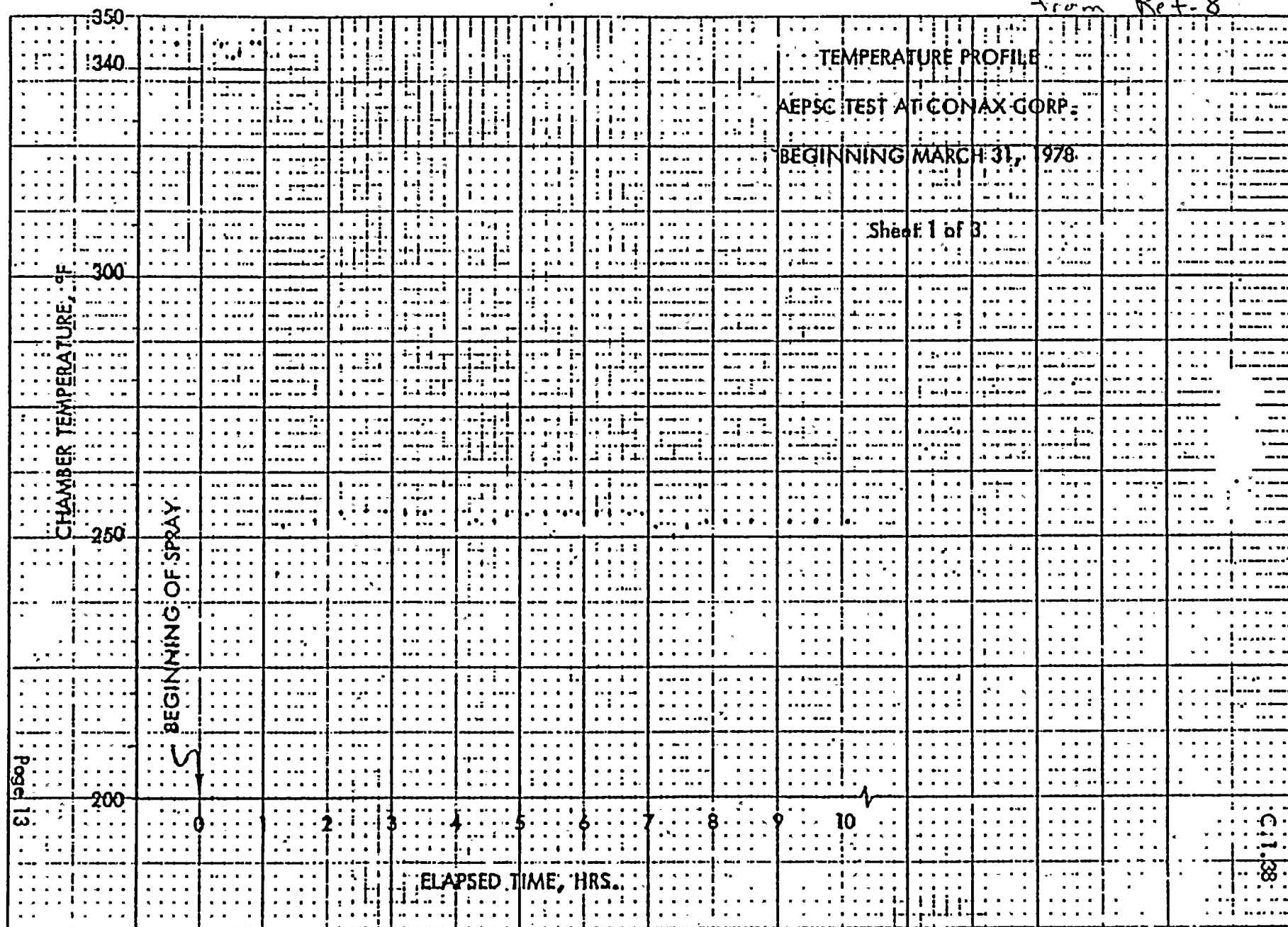
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73-7415
151-1671
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*Documentation References:

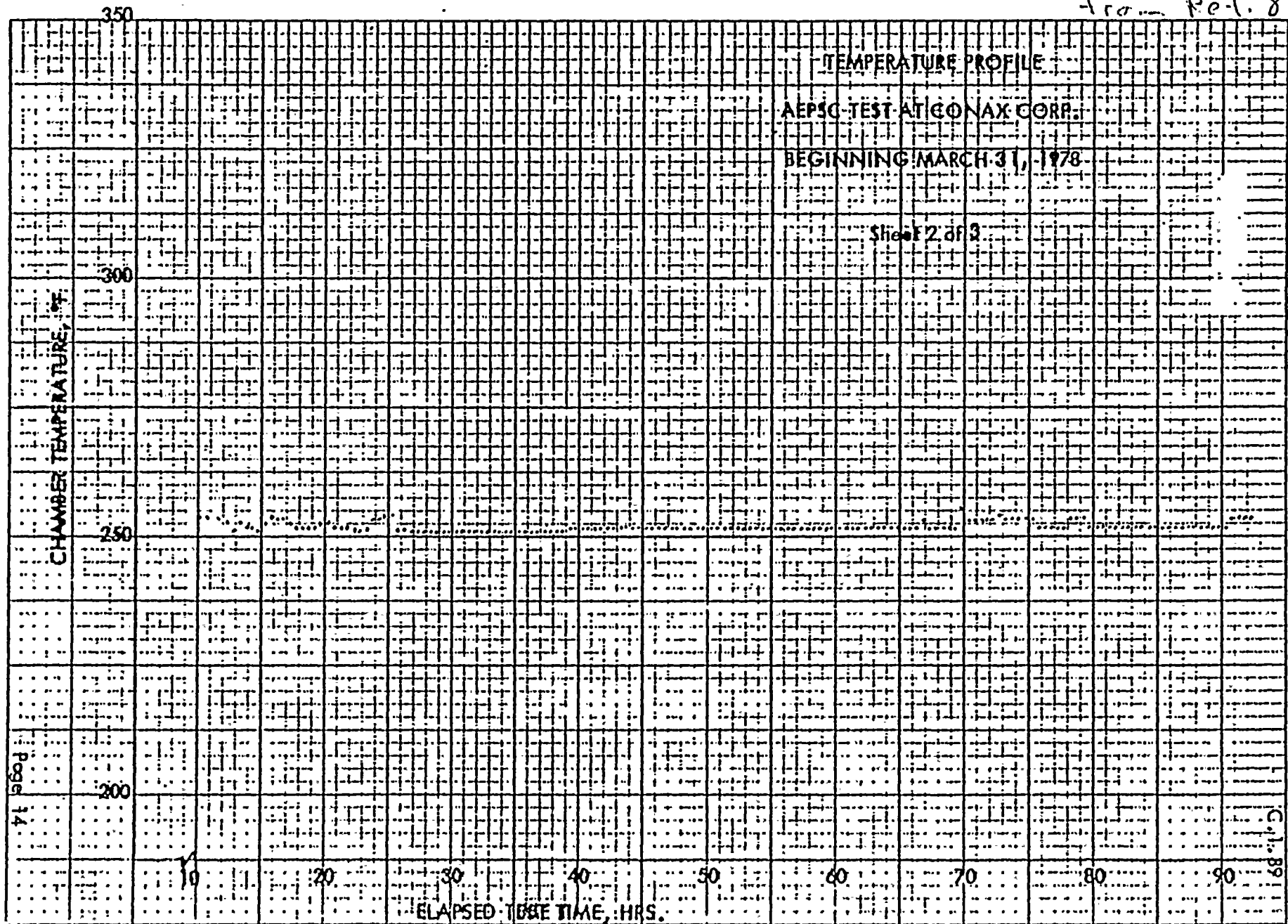
62. Instr. CABLE TERM. Packet
63. Res'd Time Qual. Analysis

Notes:

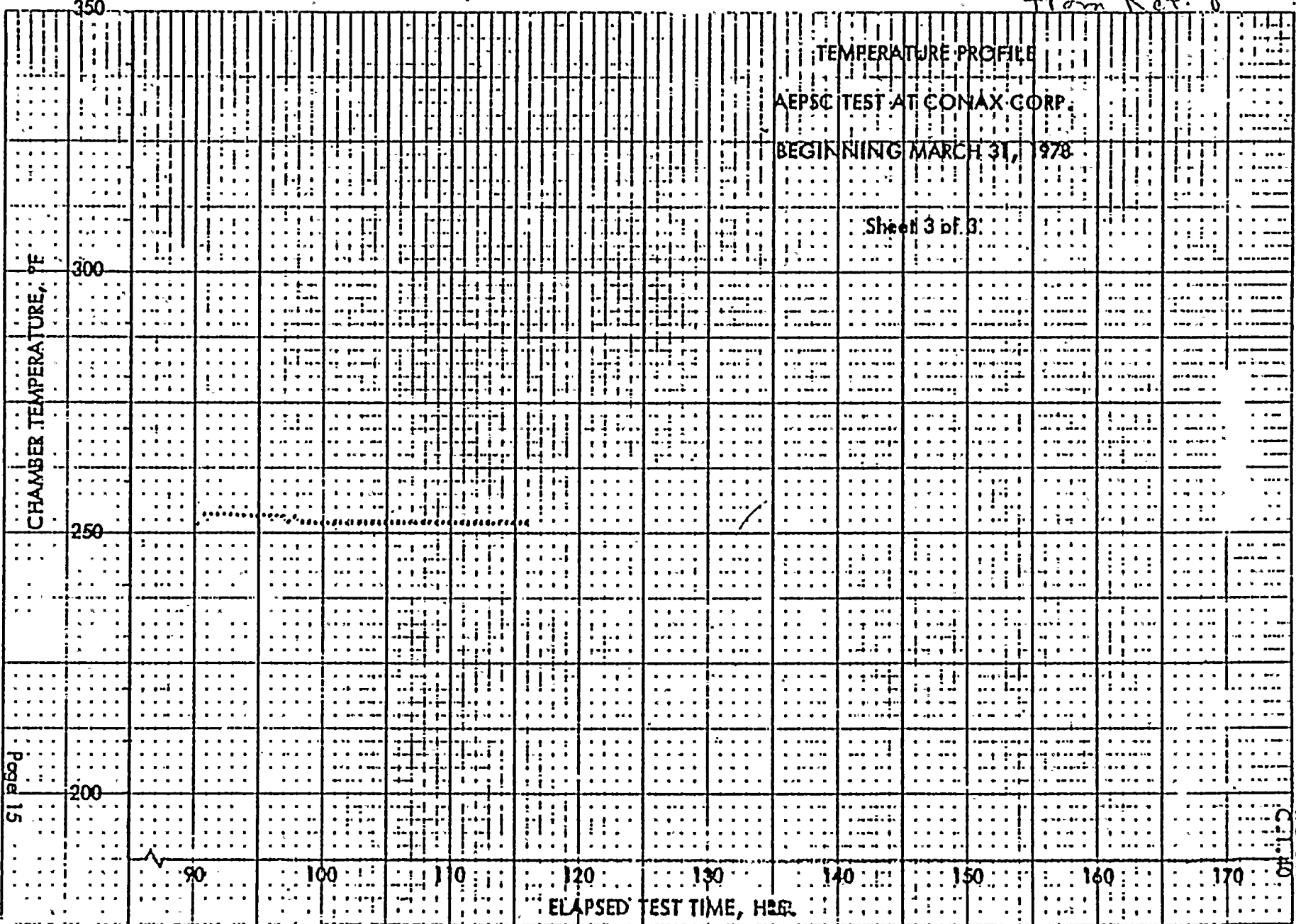
From Ref. 8



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from Ref. 8



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IPS-348

from Ref. 9. Qualified by FIRL Test Report F-C4033-1 of Jan. 1975 9

Type of Test: Simultaneous, gamma radiation
steam
chemical spray

Test Profile:

.2 - .3 Mrads/hr, 200 Mrads
351°F, 70 psig for 10 hrs
275°F, 31 psig for 4.5 days
212°F, 10 psig for 26 days

Chemical Spray: 3000 ppm boron as boric acid, .064 molar
sodium thiosulfate and adjusted with
Na OH to a PH of 10.5 at room temp.



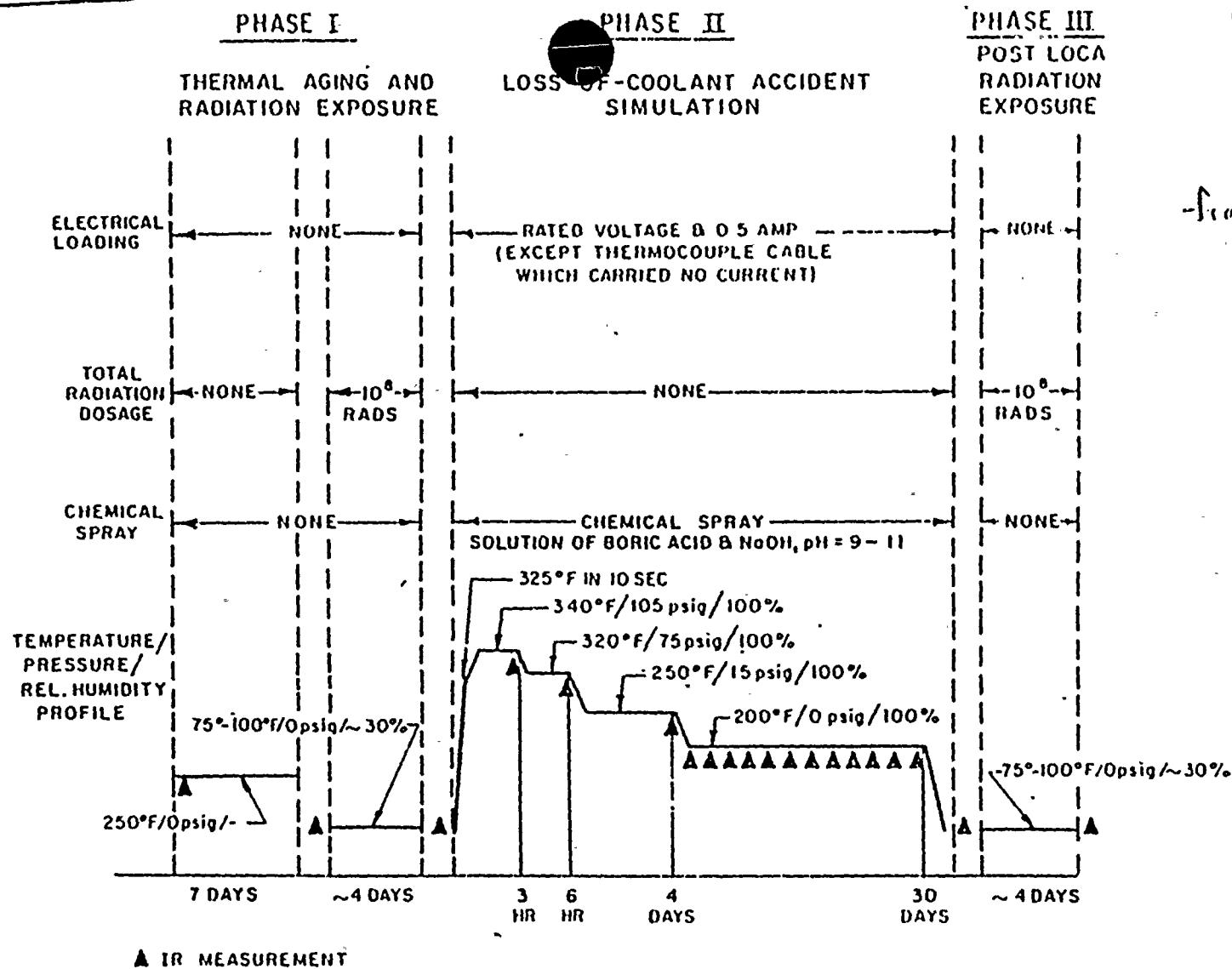
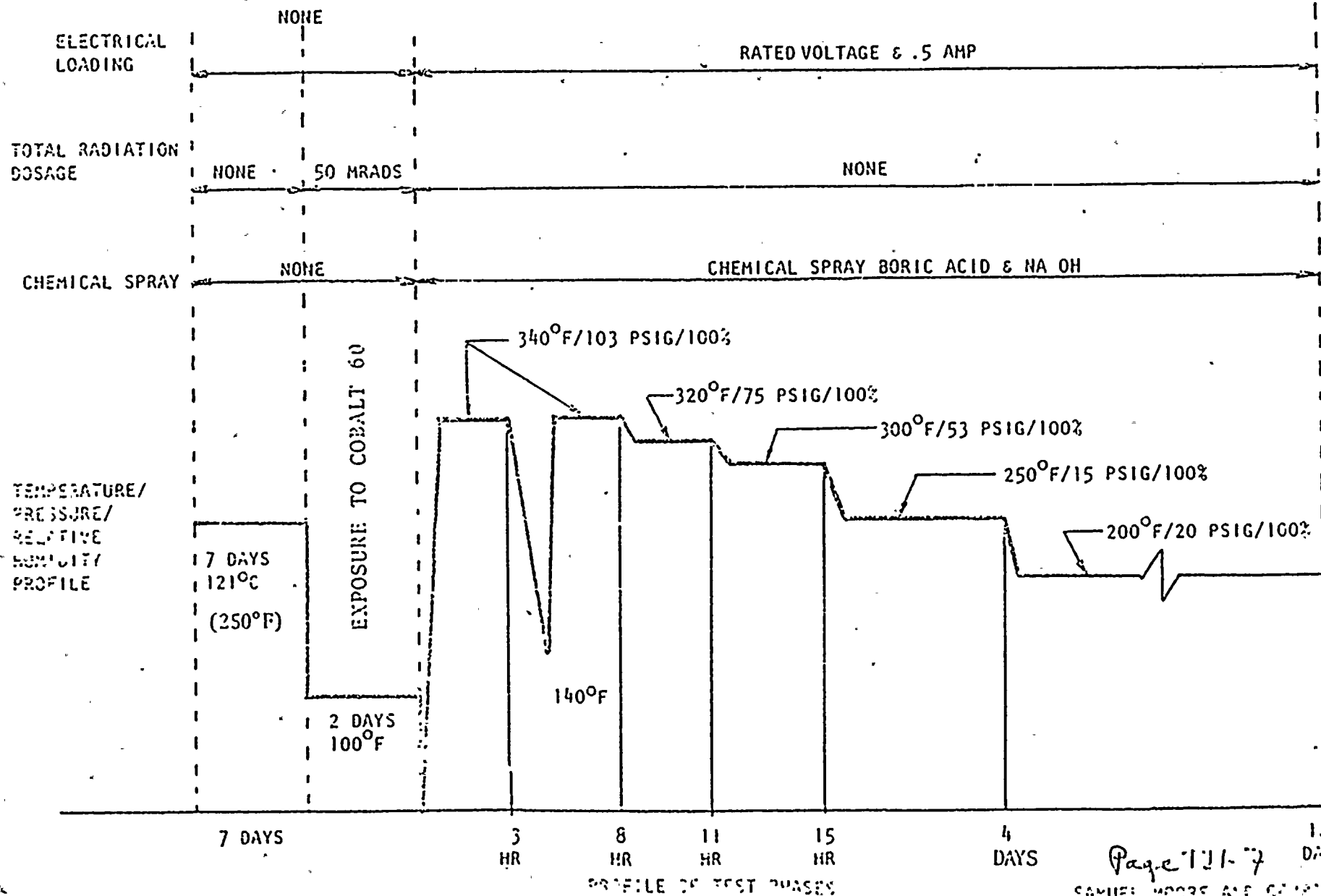


Figure 2. Profile of Test Phases

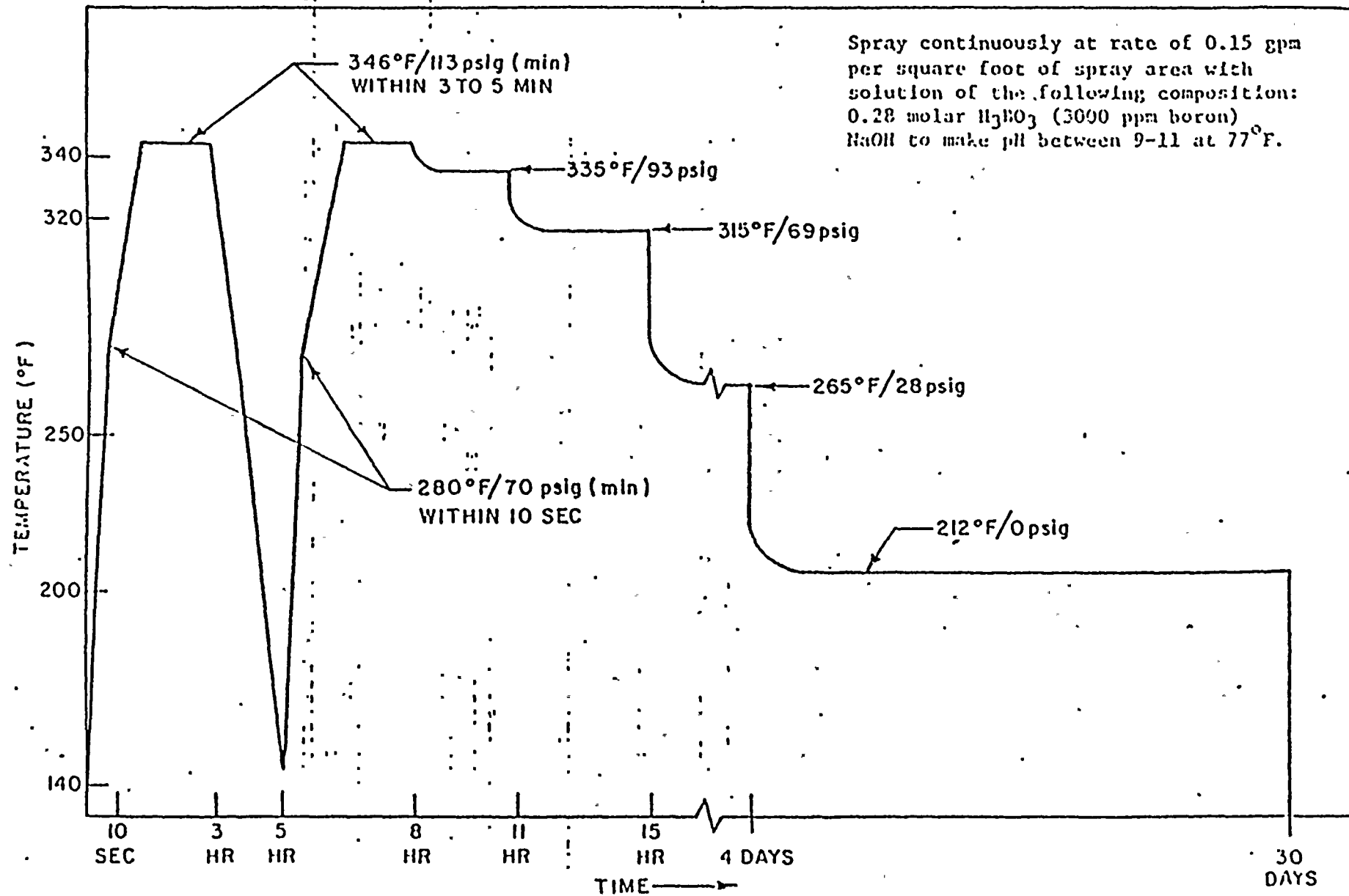
F-C3683

THERMAL AGING AND
RADIATION EXPOSURE

LOSS-OF-COOLANT ACCIDENT SIMULATION



LOCA Profile



Spray continuously at rate of 0.15 gpm per square foot of spray area with solution of the following composition:
0.28 molar H_3BO_3 (3090 ppm boron)
NaOH to make pH between 9-11 at 77°F.

LOCA PROFILE

7.



From Ref. 14. Type of Test (F-C4033-3): Simultaneous.
Radiation/chem. spray/steam.

Test Profile:

.2-.3 Mrads/hr, 200 Mrads
351°F, 70 psig for 10 hrs
275°F, 31 psig for 4.5 days
212°F, 10 psig for 26 days

Chemical spray: 3000 ppm boron as boric acid,
.054 molar sodium thiosulfate and adjusted with
Na OH to a PH of 10.5.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	4 mo.	> 44 mo.	Table 7.5-2	6 3/2	Combination	None
PLANT ID NO: N/A	Temperature (°F)	FIG 022.9-1-2	340	FSAR APP 9	6 2	Combination	None
COMPONENT: RTD TERMINATIONS	Pressure (PSIA)	FIG 1 FIG 2	119.7	ACW 6504	6 2	Combination	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100		6 2	Combination	None
MODEL NUMBER: RTD TERMINATIONS	Chemical Spray	2000 ppmB 1/14 wt % Basic pH 9-11 Acid	2000 ppmB 1/14 wt % Basic pH 9-11 Acid	T.S. 3/4.5 3/4.5.6	6 2	Combination	None
FUNCTION:	Radiation (10 ⁶ rads)	9.5	150	NCAP 7410-L VOL 1	6 2	Combination	None
ACCURACY: SPEC: N/A DEMON: N/A	Aging (years)						
SERVICE: VARIOUS	Submergence	submerged	Yes		6 2	Combination	None
LOCATION: Inside Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: NO							

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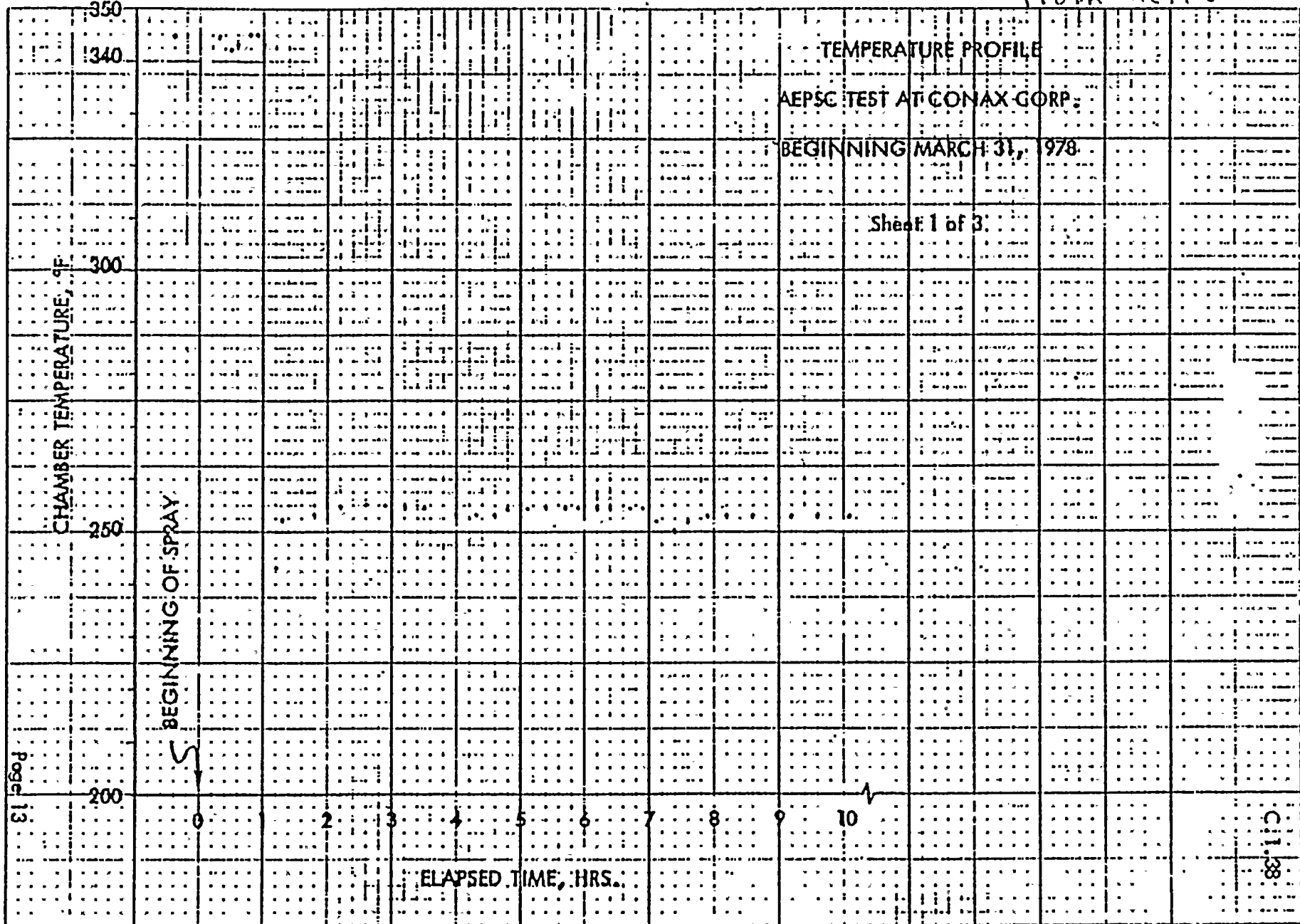
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*Documentation References:

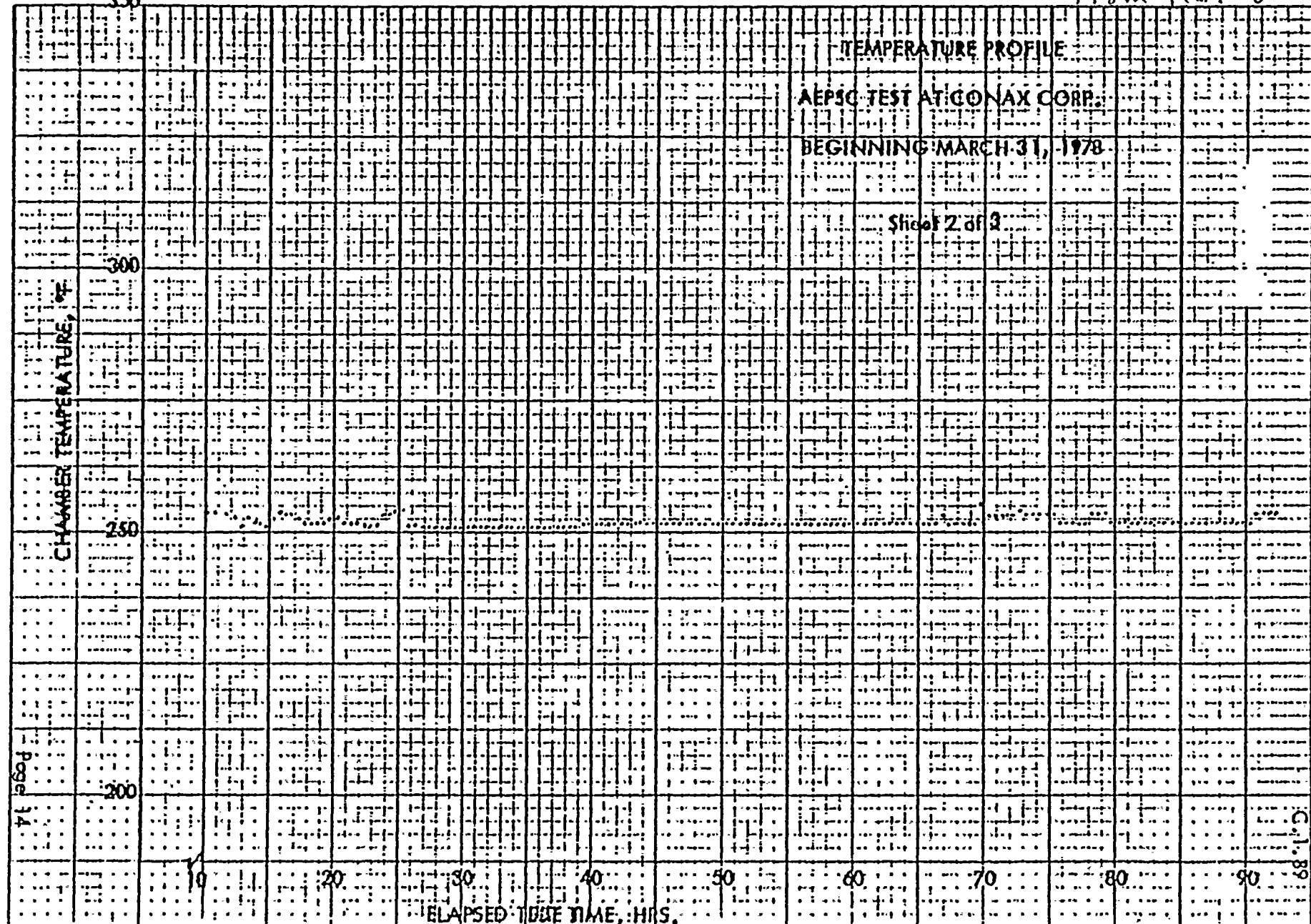
- 62. Instr. Cable Term Packet
- 63. Req'd Time Qual. Analysis

Notes:

From Ref. 8

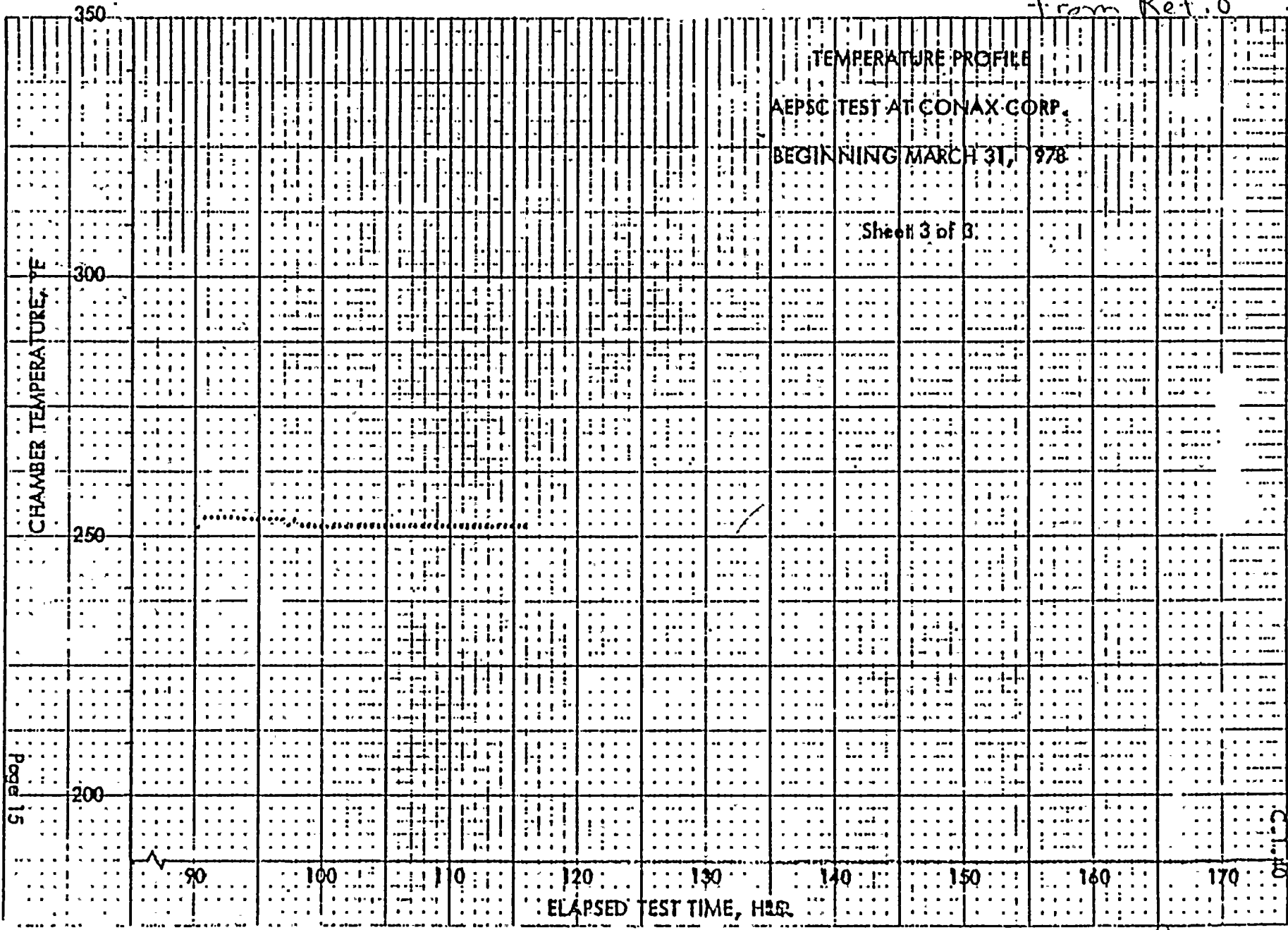


From Ref. 8





from Ref. 8



from Ref. 9. Qualified by FURL Test Report F-C4033-1 of Jan. 1975 9

Type of Test: Simultaneous, gamma radiation
steam
chemical spray

Test Profile:

.2 - .3 Mrads/hr, 200 Mrads
351°F, 70 psig for 10 hrs
275°F, 31 psig for 4.5 days
212°F, 10 psig for 26 days

Chemical Spray: 3000 ppm boron as boric acid, .064 molar
sodium thiosulfate and adjusted with
Na OH to a PH of 10.5 at room temp.

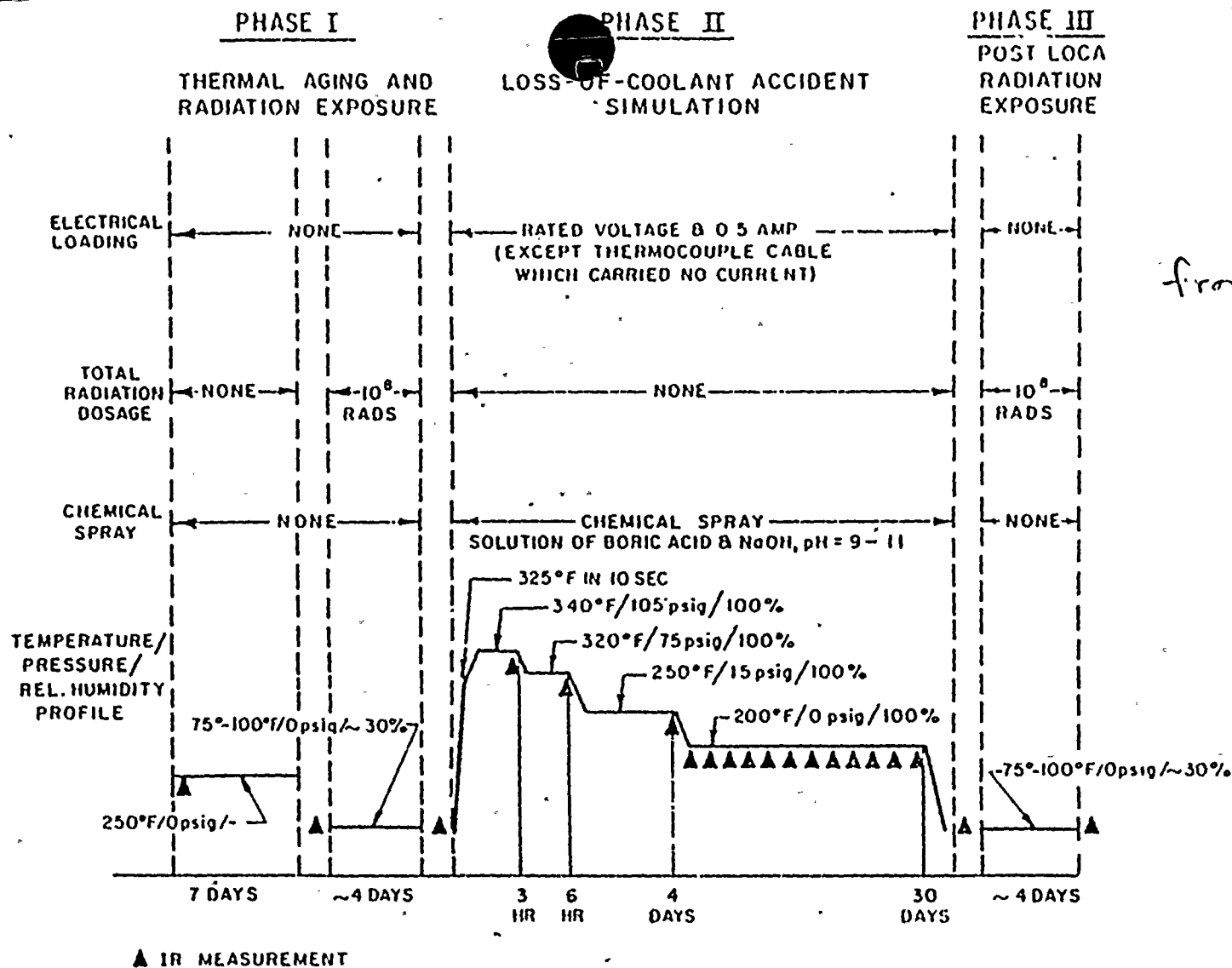
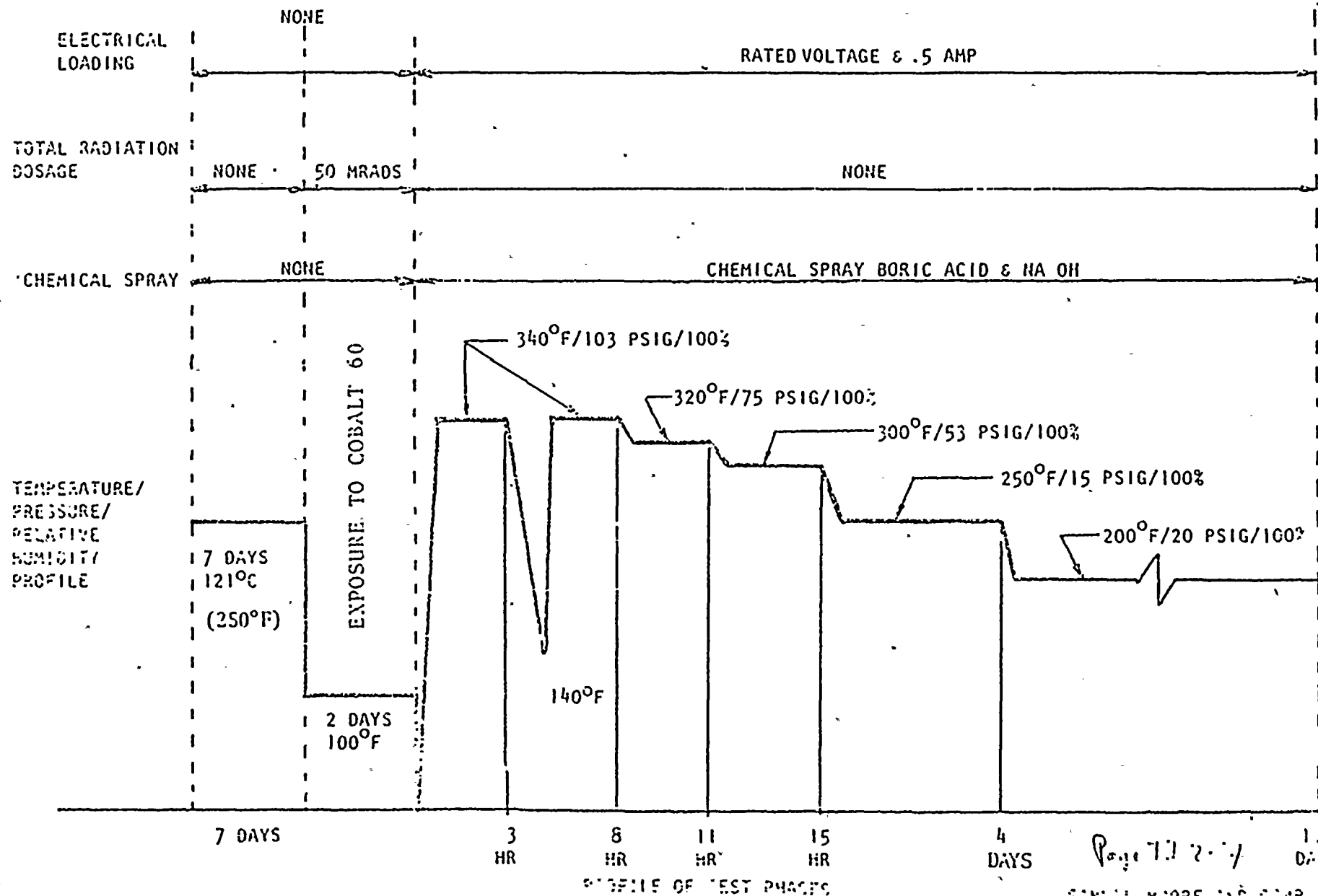


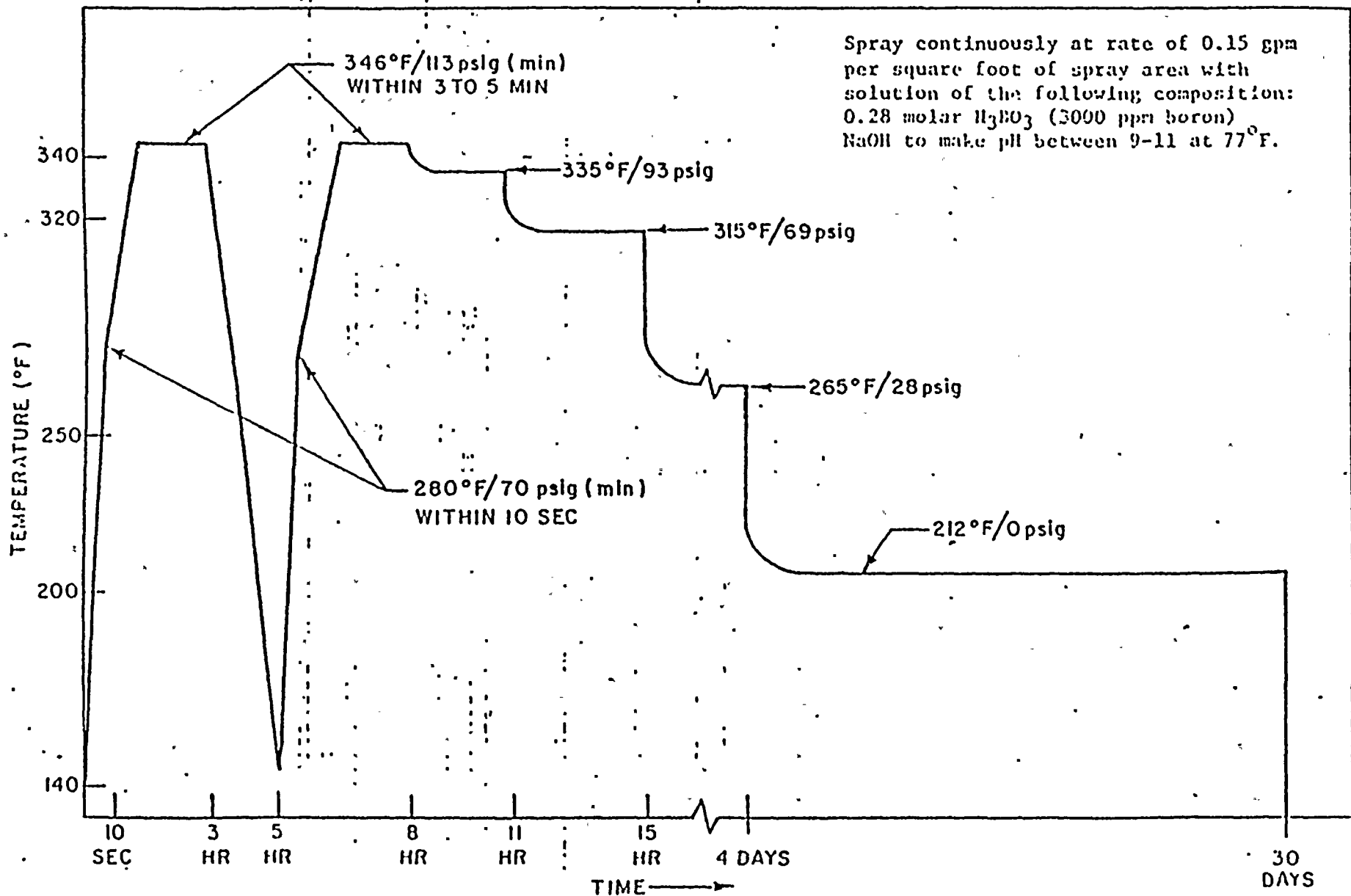
Figure 2. Profile of Test Phases

THERMAL AGING AND RADIATION EXPOSURE

LOSS-OF-COOLANT ACCIDENT SIMULATION



LOCA Profile



LOCA PROFILE

7.

from Ref. 14. Type of Test (F-C4033-3): Simultaneous
Radiation/chem. spray/steam.

Test Profile:

.2-.3 Mrads/hr, 200 Mrads
351°F, 70 psig for 10 hrs
275°F, 31 psig for 4.5 days
212°F, 10 psig for 26 days

Chemical spray: 3000 ppm boron as boric acid,
.004 Molar sodium thiosulfate and adjusted with
Na OH to a PH of 10.5.



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EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	4 mo.	>44 mo.	Table 7.5-2	63 13	Seq.	None
PLANT ID NO: N/A	Temperature (°F)	Fig 022.9-1,2	340	FSAR App 9	13	Seq.	None
COMPONENT: PENETRATION TERMINATIONS	Pressure (PSIA)	Fig 2 Fig 1	118	AEW 6504	13	Seq.	None
MANUFACTURER: N/A	Relative Humidity (%)	100	100		13	Seq.	None
MODEL NUMBER: PENETRATION TERMINATIONS	Chemical Spray	Not Req'd	2500 ppm B 1.43 wt % Bore Ph 9.5. Acid	T.S. 314.5 3145.6	13	Seq.	None
FUNCTION:	Radiation (10 ⁶ rads)	95	150	AEW 729	13	Seq.	None
ACCURACY: SPEC: N/A DEMON: N/A	Aging (years)						
SERVICE: VARIOUS							
LOCATION: Inside Containment							
FLOOD LEVEL ELEV: 612 ABOVE FLOOD LEVEL: No	Submergence	submerged	FLOOD UP Tube.		61	Combination	None

*Documentation References:

Notes:

13. Westinghouse - CANADA Test Report CWAPD-332

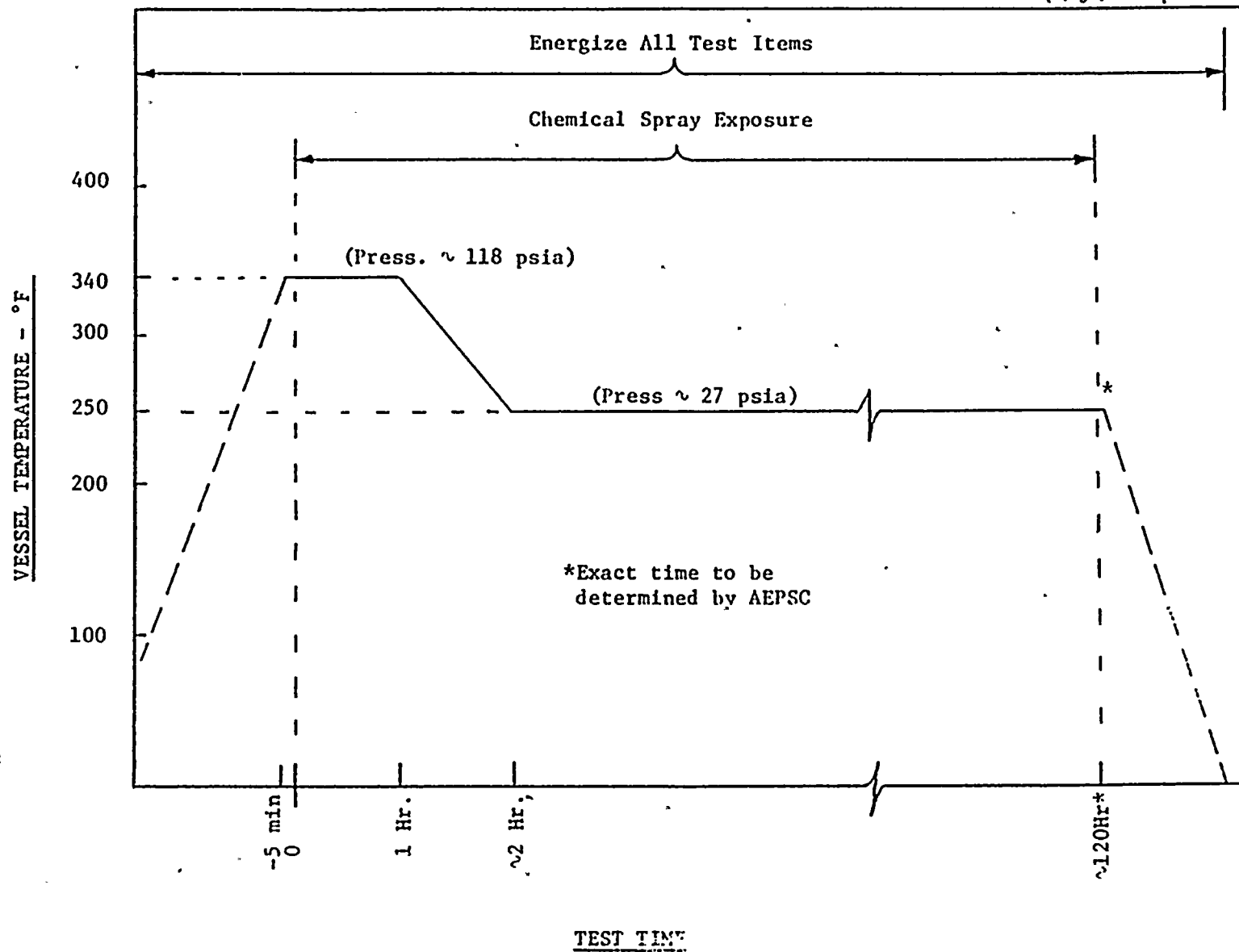
61. FLOODUP Tube Qual. Pocket

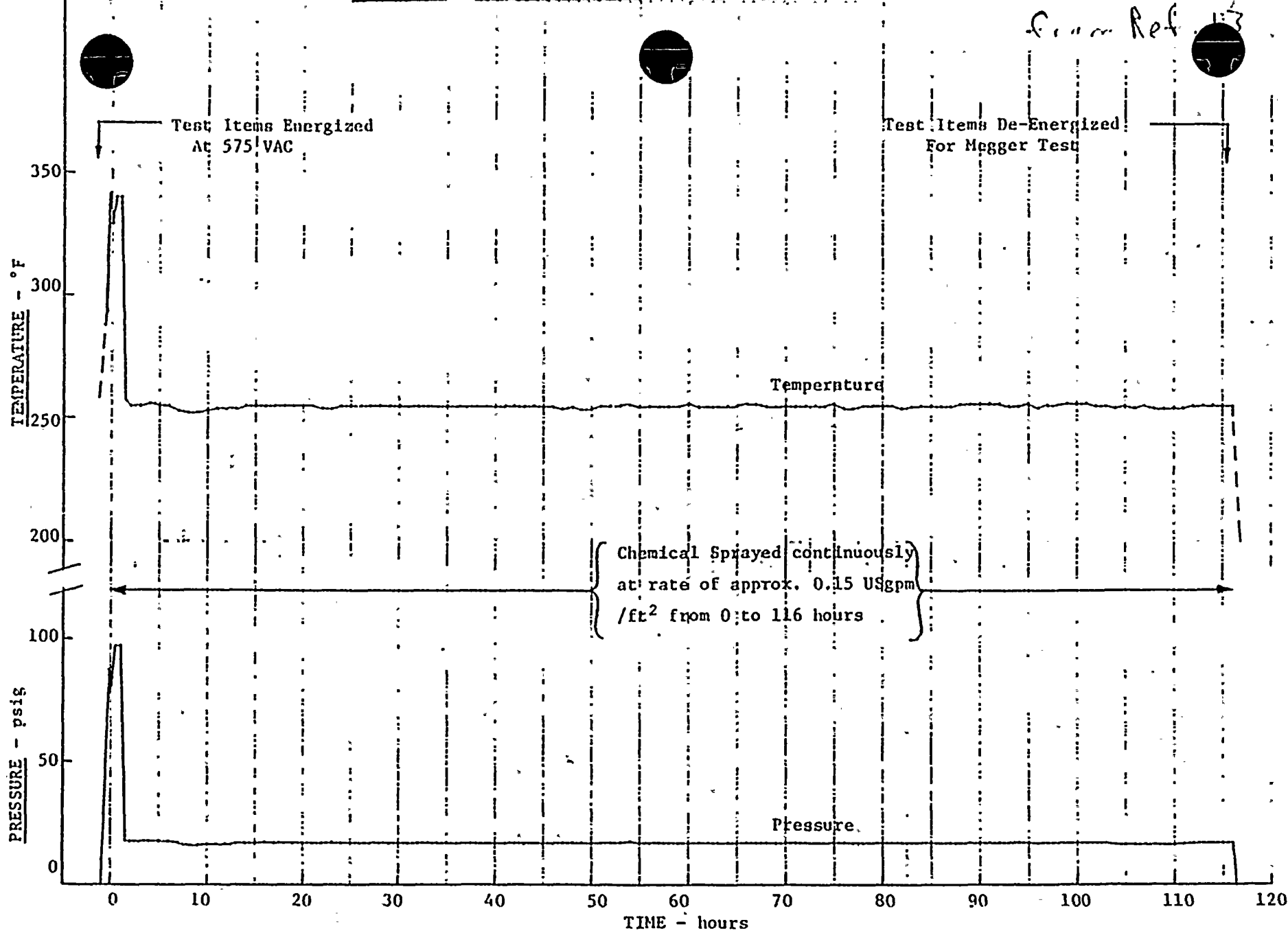
63. Req'd Time Qual. Analysis



FIGURE 2

TEST PROFILE





EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>4 mo.</i>	<i>> 4.4 mo.</i>	<i>Table 7.5-2</i>	<i>62</i>	<i>Combination</i>	<i>None</i>
PLANT ID NO: <i>N/A</i>	Temperature (°F)	<i>Fig 022.9-1, -2</i>	<i>340</i>	<i>FSAR APP Q</i>	<i>62</i>	<i>Combination</i>	<i>None</i>
COMPONENT: <i>INSTRUMENT</i> CABLE TERMINATION MANUFACTURER: <i>N/A</i>	Pressure (PSIA)	<i>Fig 1 Fig 2</i>	<i>119.7</i>	<i>AEW 6504</i>	<i>62</i>	<i>Combination</i>	<i>None</i>
MODEL NUMBER: <i>INSTRUMENT</i> CABLE SPLICE - AT PENETRATION	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>62</i>	<i>Combination</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Chemical Spray	<i>2000ppmB 1.14wt% Boric 119-11 Acid</i>	<i>2000ppmB 1.14wt% Boric 119-11 Acid</i>	<i>T.S. 2/4.5 3/4.5.6</i>	<i>62</i>	<i>Combination</i>	<i>None</i>
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Radiation (10 ⁶ rads)	<i>95</i>	<i>150</i>	<i>WCAP 7410-L VOL 1</i>	<i>62</i>	<i>Combination</i>	<i>None</i>
SERVICE: <i>VARIOUS</i>	Aging (years)						
LOCATION: <i>In Containment</i>	Submergence	<i>submerged</i>	<i>Yes</i>		<i>62</i>	<i>Combination</i>	<i>None</i>
FLOOD LEVEL ELEV: <i>612.1</i> ABOVE FLOOD LEVEL: <i>No</i>							

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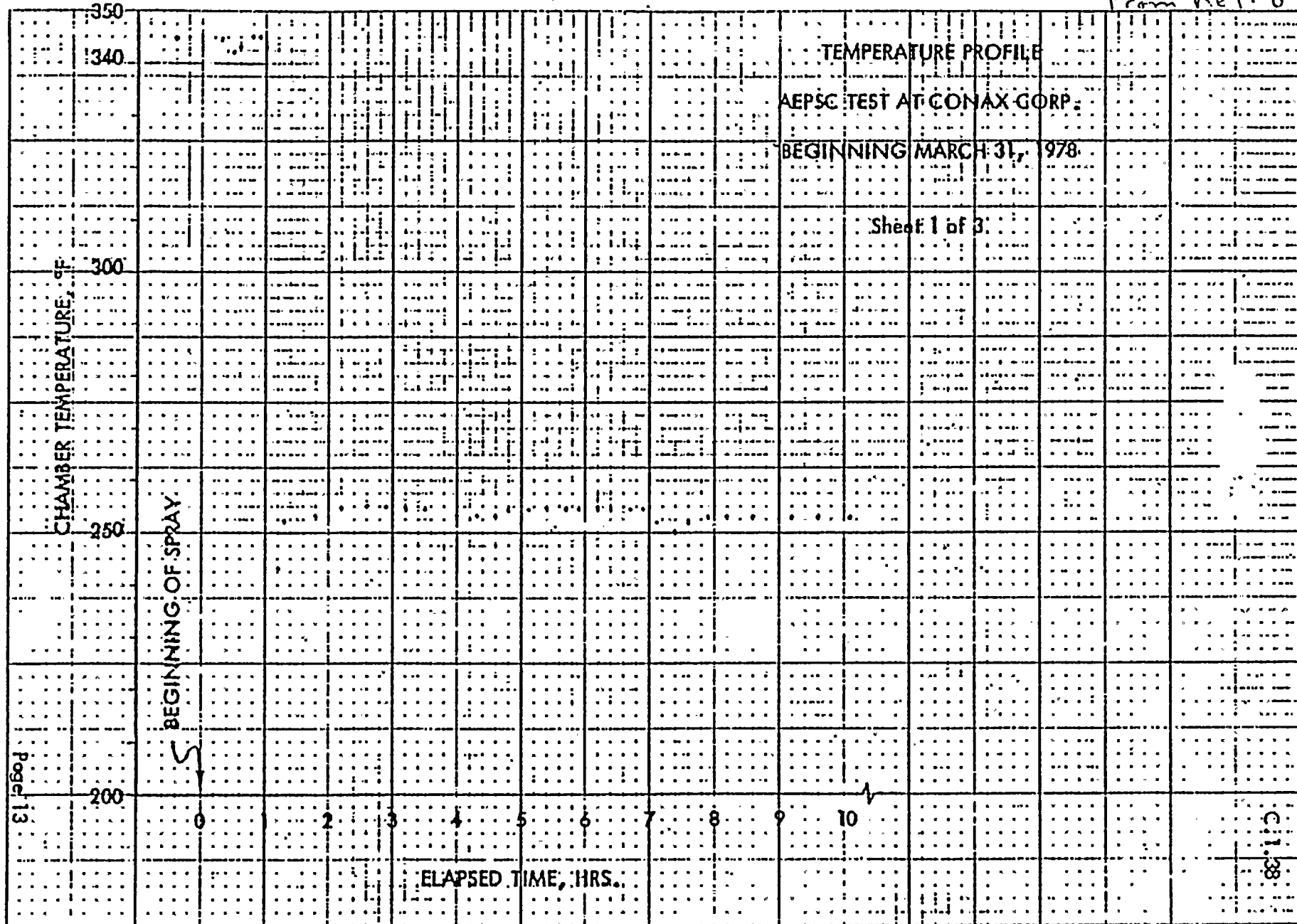
*Documentation References:

Notes:

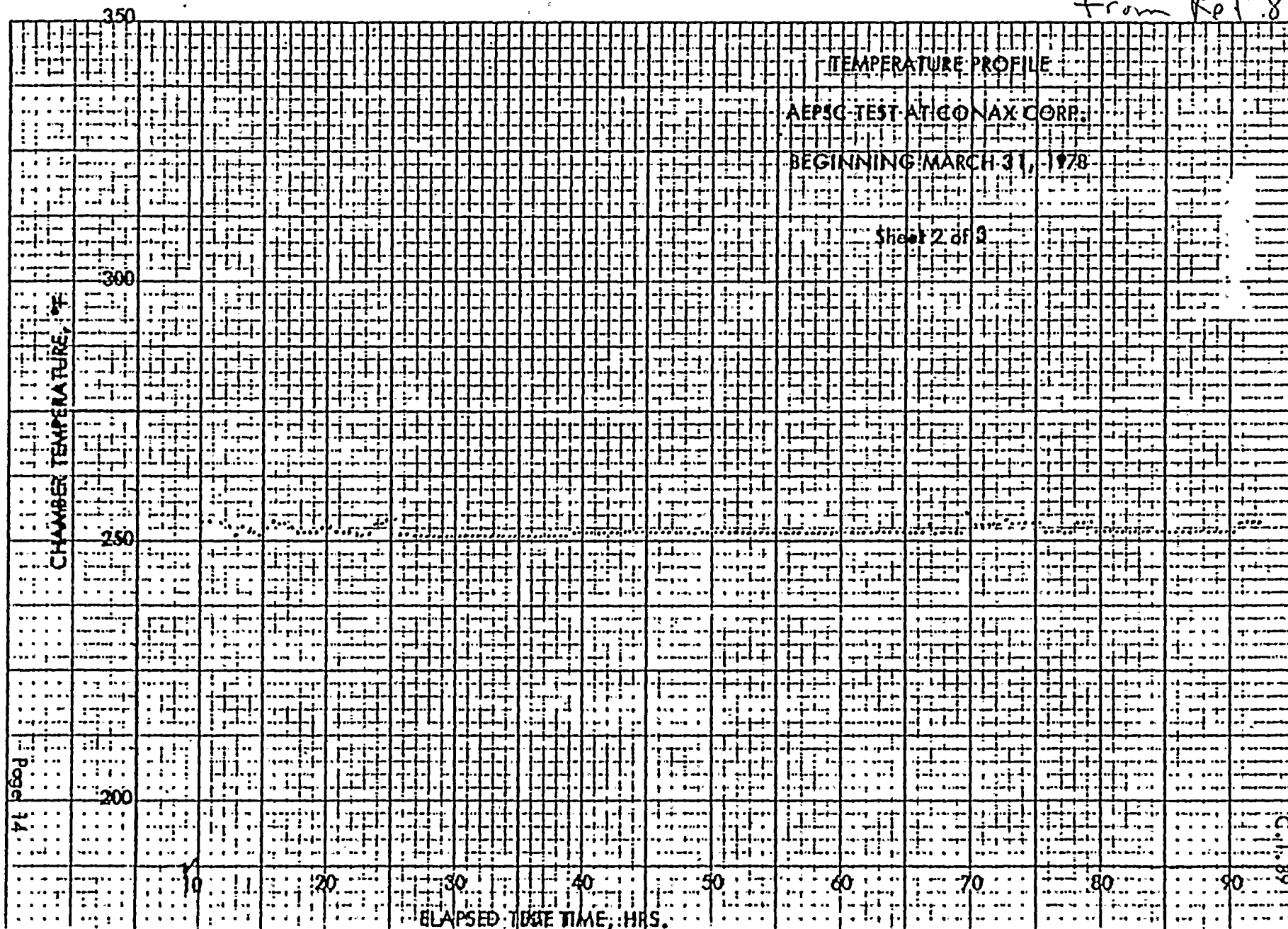
62. Instr. Cable Term. Packet
63. Req'd Time Qual. Analysis



from Ref. 8

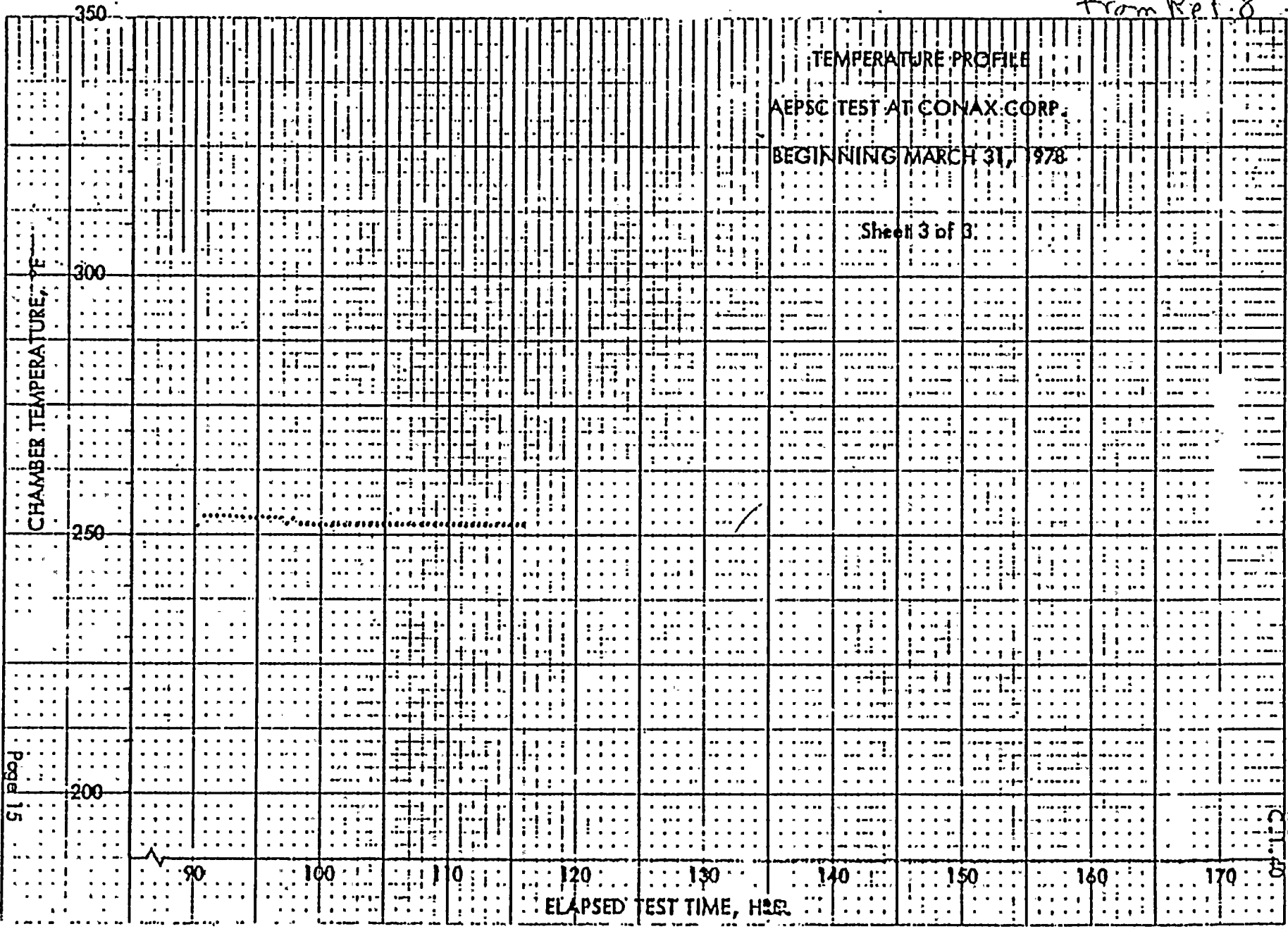


from Ref. 8





from Ref. 8



From Ref. 9. Qualified by FIRC Test Report F-C4033-1 of Jan. 1975 .9

Type of Test: Simultaneous, gamma radiation
steam
chemical spray

Test Profile:

.2 - .3 Mrads/hr, 200 Mrads
351°F, 70 psig for 10 hrs
275°F, 31 psig for 4.5 days
212°F, 10 psig for 26 days

Chemical Spray: 3000 ppm boron as boric acid, .064 molar
sodium thiosulfate and adjusted with
Na OH to a PH of 10.5 at room temp.

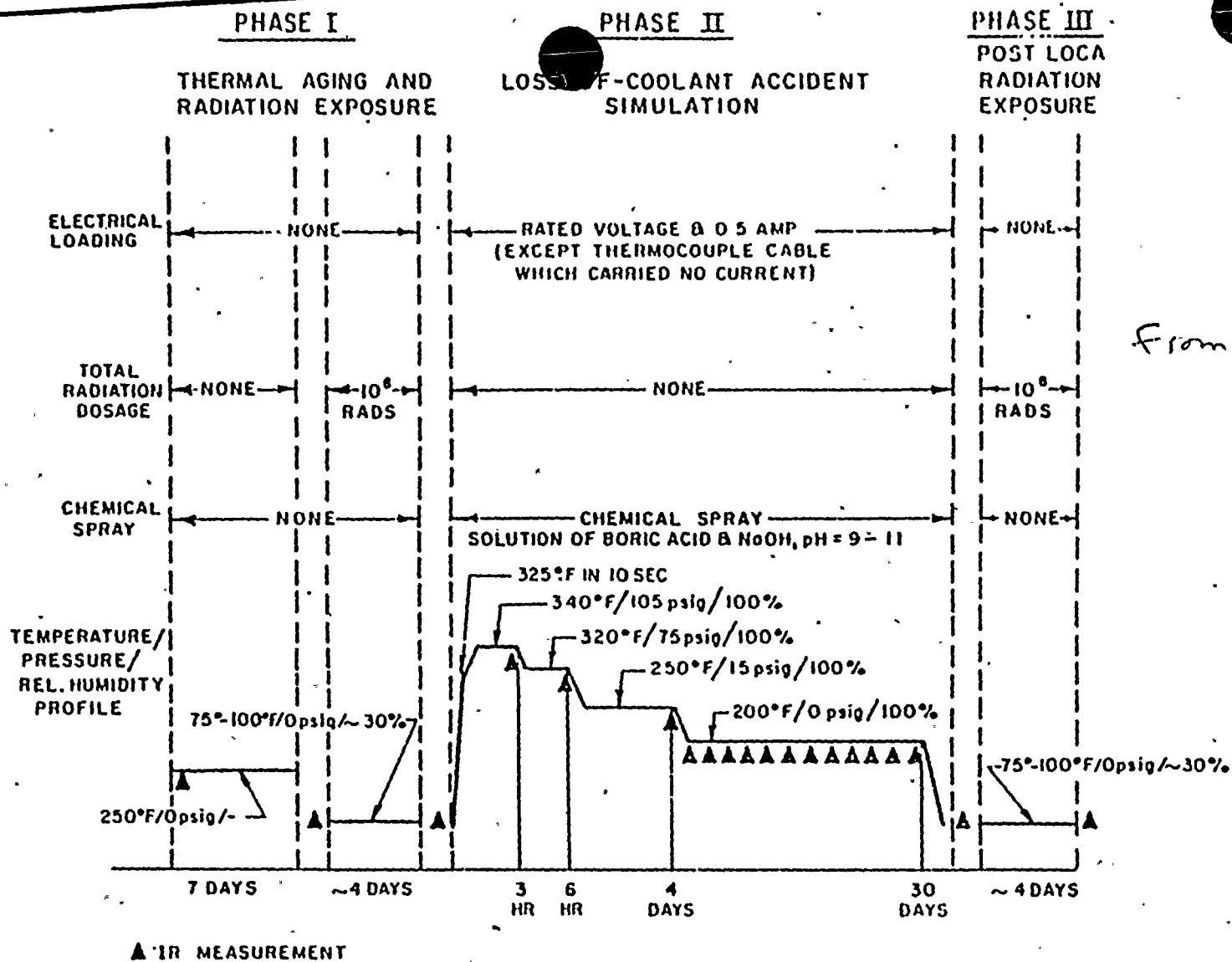
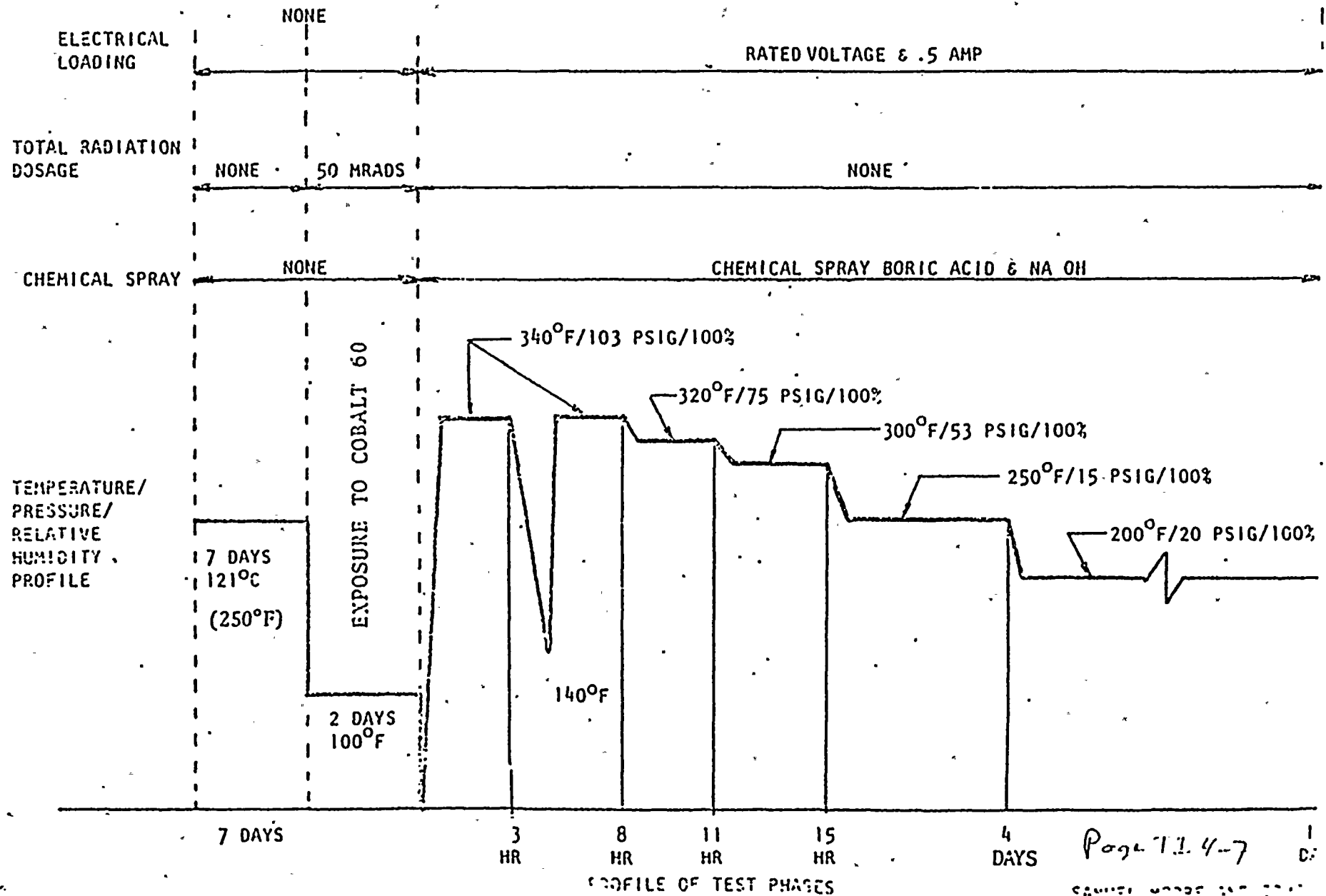


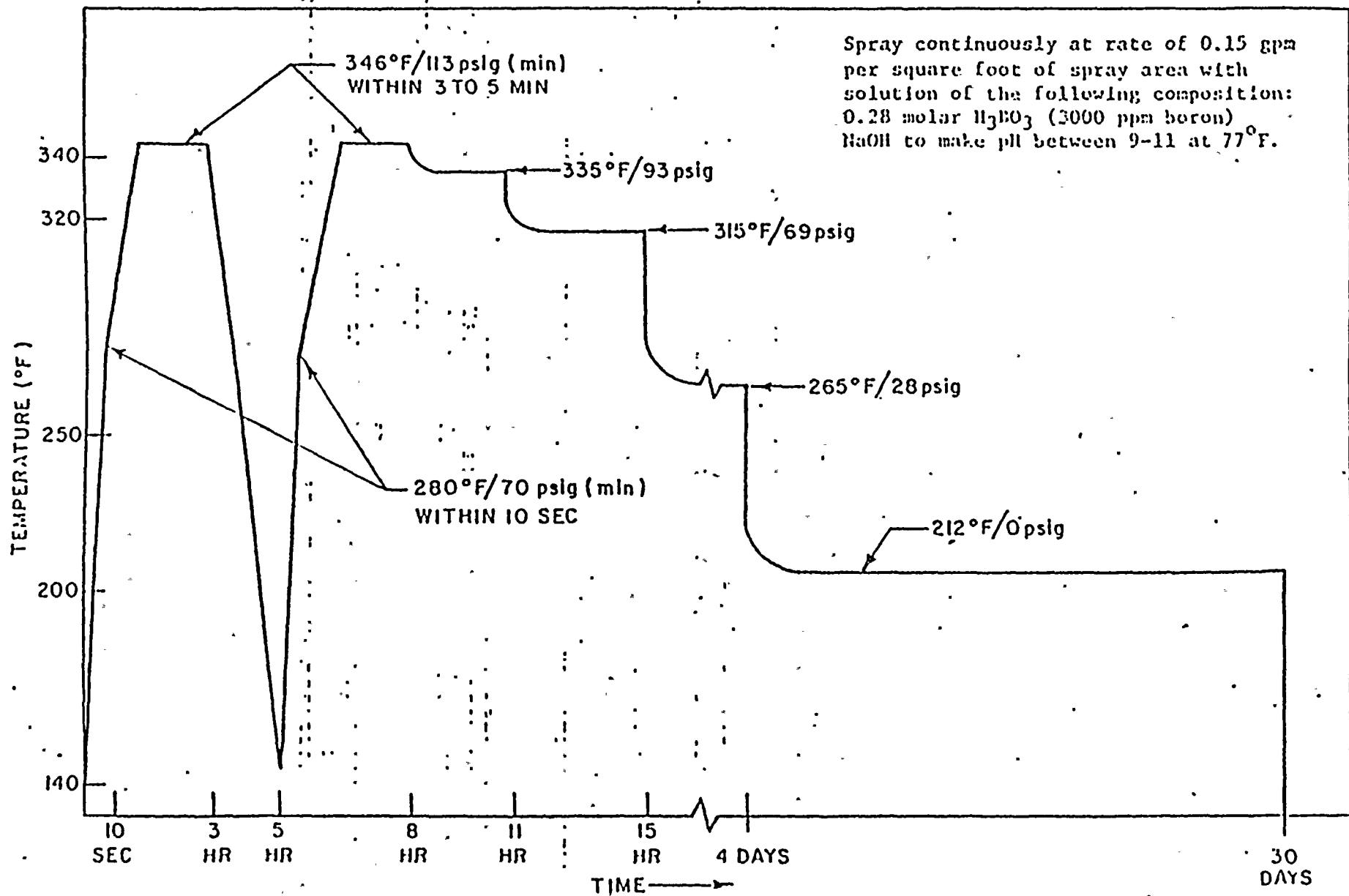
Figure 2. Profile of Test Phases

THERMAL AGING AND
RADIATION EXPOSURE

LOSS-OF-COOLANT ACCIDENT SIMULATION



LOCA Profile



LOCA PROFILE

7.

From Ref. 14. Type of Test (F-C4033-3): Simultaneous
Radiation/chem. spray/steam.

Test Profile:

.2-.3 Mrads/hr, 200 Mrads
351°F, 70 psig for 10 hrs
275°F, 31 psig for 4.5 days
212°F, 10 psig for 26 days

Chemical spray: 3000 ppm boron as boric acid,
.054 molar sodium thiosulfate and adjusted with
Na OH to a PH of 10.5.

from Ref. 18.

Qualified by Conax Corp. Test Report IPS-327
of Jan. 1978.

Type of Test: Sequential, steam
floodup with borated
water.

Test Profile:

340°F, 12 psig for 1 hr
250°F, 12 psig for 6 hrs
190°F, 12 psig for 24 hrs

Floodup borated water



from Ref. 19.

Qualified by Conax Corp. Test Report IPS-329
of Jan. 1978.

Type of Test: Sequential, steam
floodup with borated
water.

Test Profile:

340°F, 12 psig for 2 hr
250°F, 12 psig for 6 hrs
190°F, 12 psig for 24 hrs

Floodup borated water.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>4 mo.</i>	<i>> 4.4 mo.</i>	<i>Table 2.5-2</i>	<i>63 27</i>	<i>Seq</i>	<i>None</i>
PLANT ID NO: <i>N/A</i>	Temperature (°F)	<i>F19 13.13-1</i>	<i>320</i>	<i>FSAR APP N</i>	<i>27</i>	<i>Seq.</i>	<i>None</i>
COMPONENT: <i>Instrument Termination at</i> MANUFACTURER: <i>Foxboro</i>	Pressure (PSIA)	<i>F191 F192</i>	<i>89.7</i>	<i>ASD 6SD4</i>	<i>27</i>	<i>Seq.</i>	<i>None</i>
MODEL NUMBER: <i>N/A</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>26</i>	<i>Seq.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Chemical Spray	<i>2000 ppm 1/14/78 Basic pH 9-11 Acid</i>	<i>2000 ppm 1/14/78 Acid pH 9.25-10 Acid</i>	<i>T.S. 3/4.5 3/4.5.6</i>	<i>27</i>	<i>Seq.</i>	<i>None</i>
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Radiation (10 ⁶ rads)	<i>3.9</i>	<i>18</i>	<i>WCAP 2410-L VOL1</i>	<i>27</i>	<i>Seq.</i>	<i>None</i>
SERVICE: <i>VARIOUS</i>	Aging (years)						
LOCATION: <i>In + Out Containment</i>	Submergence	<i>submerged</i>	<i>Floodop Tubes</i>		<i>61</i>	<i>Combination</i>	<i>None</i>
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

*Documentation References:

26. Foxboro Test Report TE-1013
 27. Westinghouse Corp. Communication NS-PLC-5023 dated
 4/26/78 from T.M. Anderson - Westinghouse to E.G. Case NRC.

61. Floodop Tube Qual. Packet
 63. Req'd Time Qual. Analysis

Notes: NO SPECIFIC ACCIDENT ANALYSIS TAKES
 CREDIT FOR ASSUMED OPERATION OF THESE
 DEVICES. THEIR USE IS REFERENCED BY
 EMERGENCY OPERATING PROCEDURES.

from Ref. 27.

Qualified by Westinghouse Electric Corp. letter of
4/26/78 (NS-PLC-5023).

From: T. M. Anderson - Westinghouse
To: E. G. Case - NRC

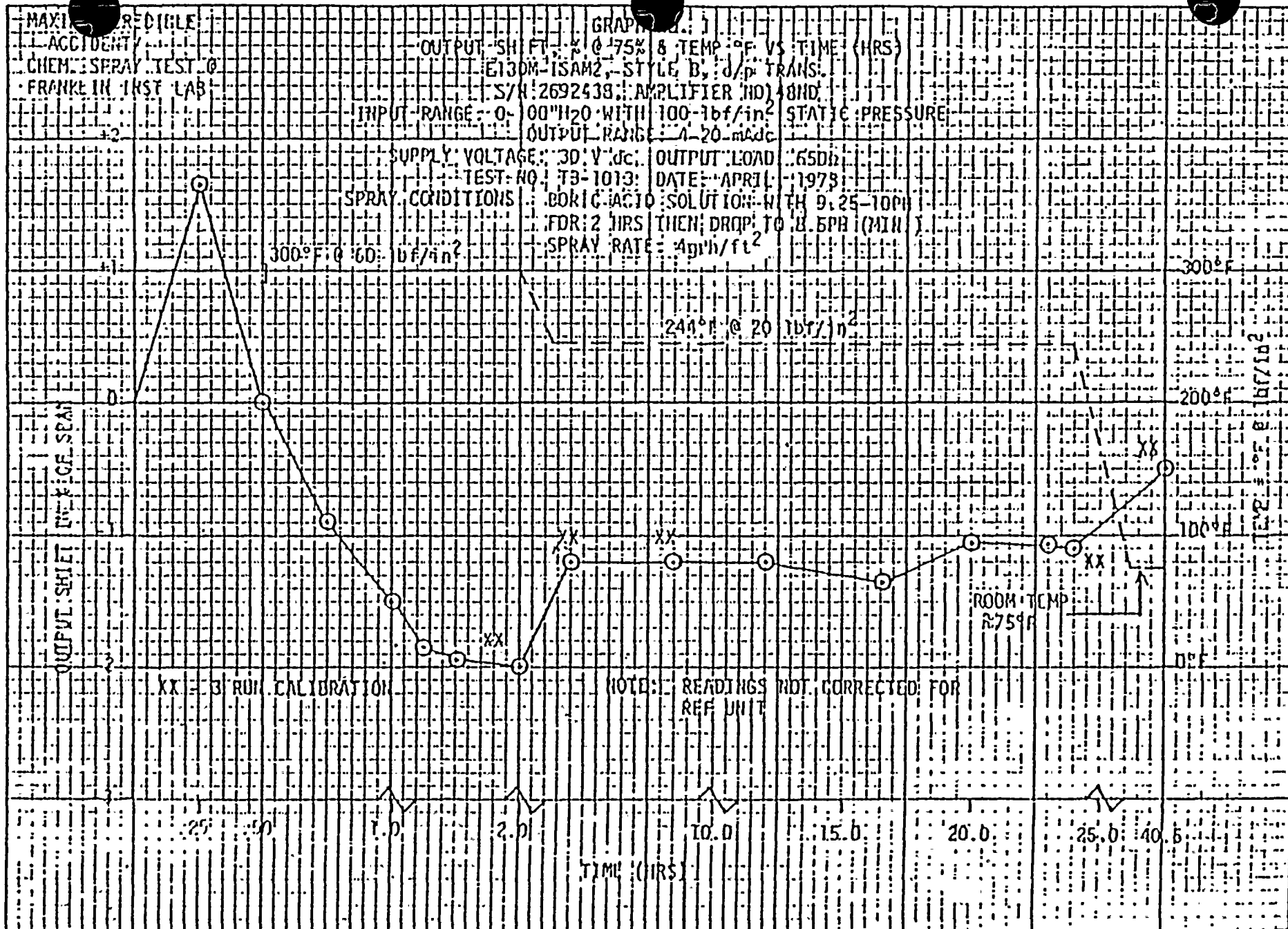
Test Type: Sequential
Steam/chemical spray/radiation

Test Profile:

18 Mrads, 1.94 Mrads/hr.
320°F, 75 psig for 20 minutes
From 320°F to 220°F in 24 hrs. (saturated conditions)
220°F, 15 psia for 5.5 days.

Chemical Spray: 1.14% boric acid
.17% Na OH



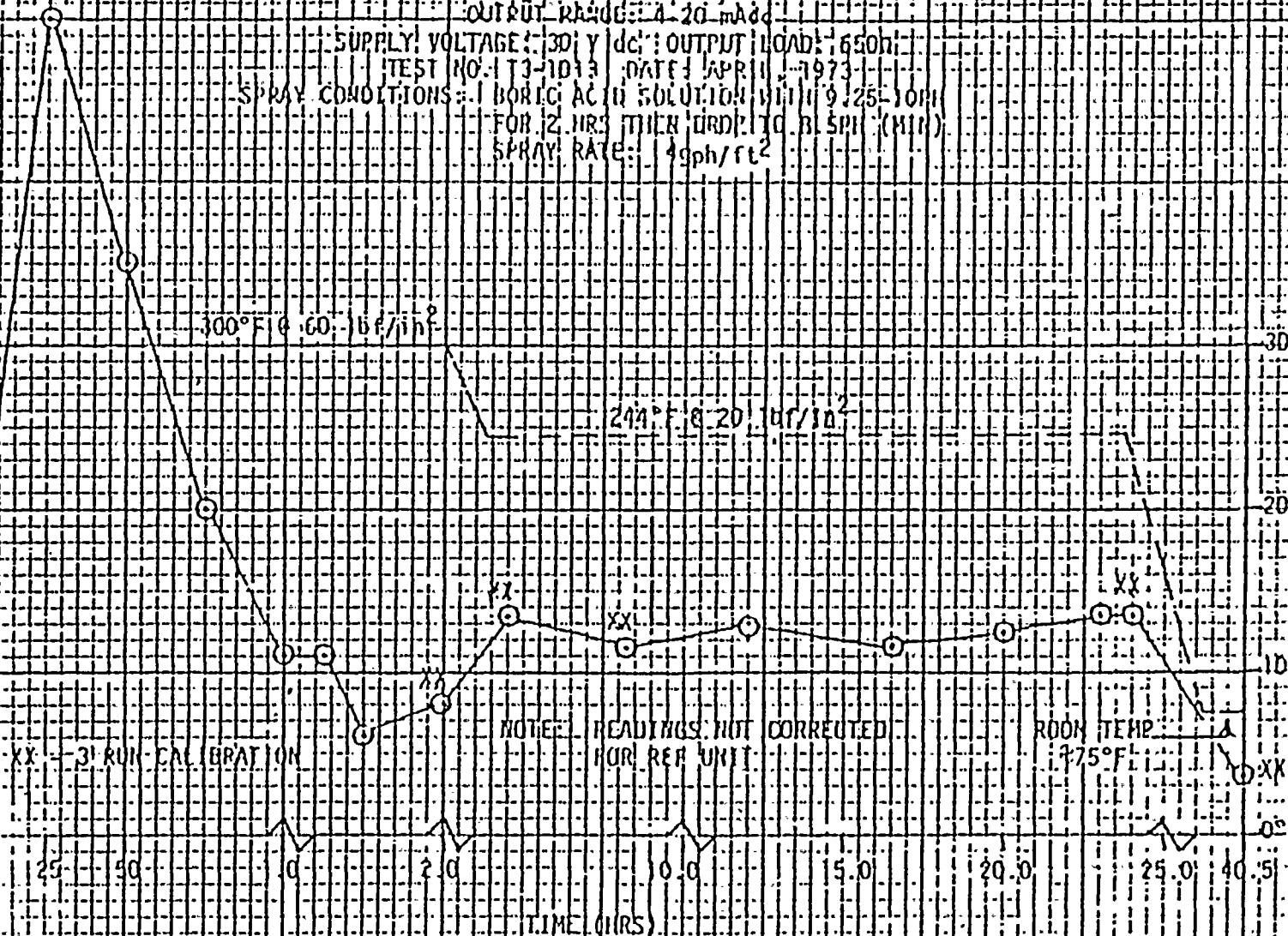


MAXIMUM CREDIBLE
CHEMICAL TEST
FRANKLIN INST. LAB

OUTPUT SHIFT: 1.8-75
TEMP °F VS TIME (HRS)
E130H-15AN2, STYLE B, 1d/p, TRANS
SYN: 2692441, AMPLIFIER 101/81L
INPUT RANGE: 0-100" H₂O WITH 100:1b/f/in² STATIC PRESSURE
OUTPUT RANGE: 0-20 madd

SUPPLY VOLTAGE: 30V dc; OUTPUT LOAD: 650h
TEST NO: T3-1013, DATE: APRIL 1973
SPRAY CONDITIONS: BORIC ACID SOLUTION WITH 9.25-10PH
FOR 2 HRS THEN DROPT TO 8.5PH (MIN)
SPRAY RATE: 49ph/ft²

OUTPUT ERROR IN % OF SPAN





MAXIMUM CREDIBLE

ACCIDENT

CHEM SPRAY TEST @

FRANKLIN INST LAB

GRAPH 1.3

OUTPUT SHIFT % @ 75% & TEMP °F VS TIME (HRS)

ETGM-TSAE21-STYLE B, TRANSMITTER S/N 2692434, AMPLIFIER NO. 148ND1

INPUT RANGE: 0-1000 lb/ft² OUTPUT RANGE: 4-20 mA

SUPPLY VOLTAGE: 30 V dc OUTPUT LOAD: 650Ω

TEST NO. T3-1013 DATE: APR 1, 1973

SPRAY CONDITIONS: BORIC ACID SOLUTION WITH 9.25-10PH
FOR 2 HRS THEN DROP TO 8.5PH (MIN)
SPRAY RATE: 4gpi/ft²

OUTPUT SHIFT IN % OF SPAN

300°F @ 60 lb/ft²

234°F @ 20 lb/ft²

300°F

200°F

100°F

0°F

SPAN 20 mA

NOTE: READING NOT CORRECTED FOR REF UNIT

ROOM TEMP: 75°F

XX - 3 RUN CALIBRATION

25 50

100

150

200

10:0

15:0

20:0

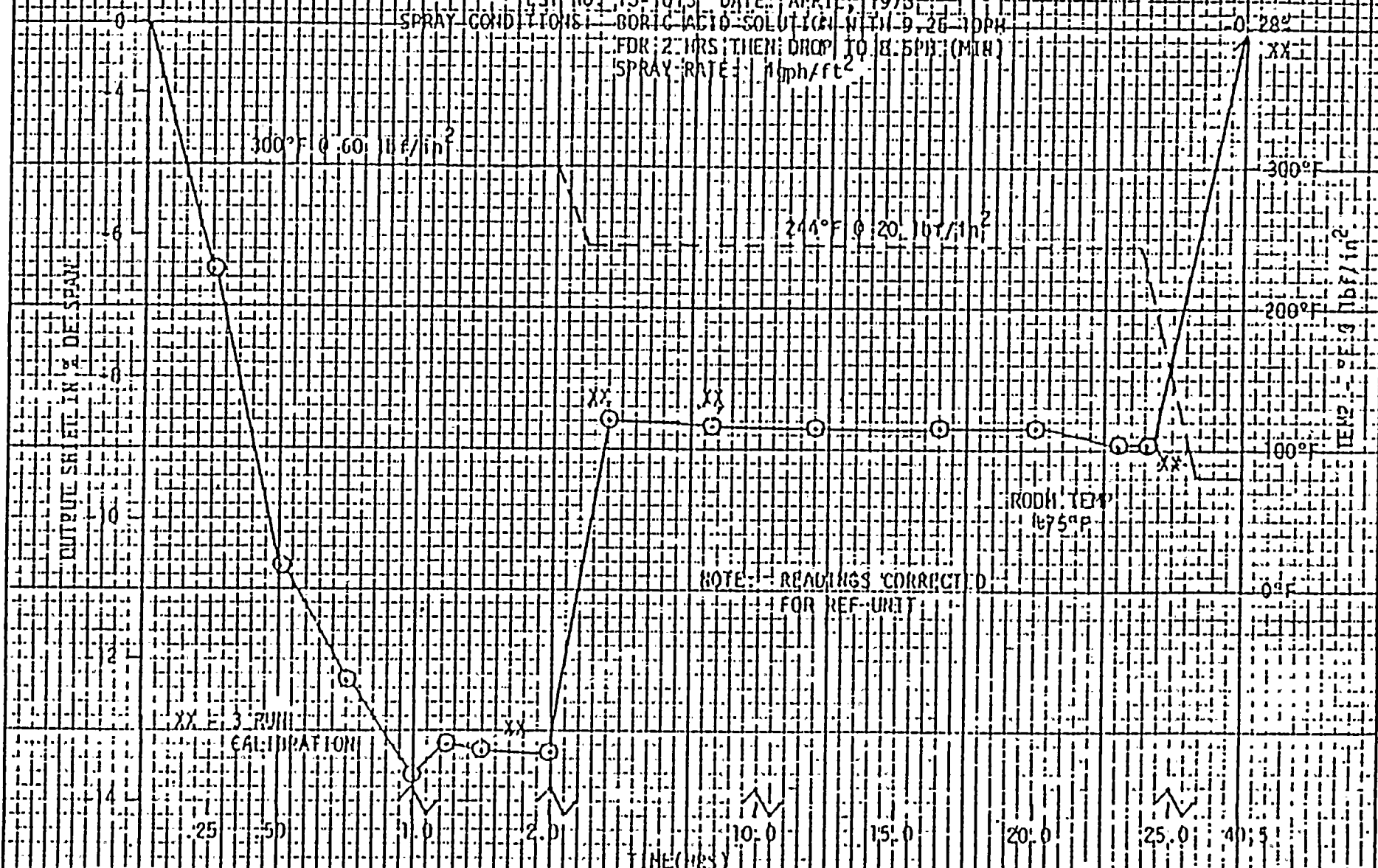
25:0 40:5

TIME (HRS)



MAXIMUM CREDIBLE
ACCIDENT/
CHEM. SPRAY TEST @
FRANKLIN INST. LAB

GRAPH NO. 4
OUTPUT SNIFF: 2.0175% & TEMP. ΔP VS TIME (HRS)
FLIGH: 11M2, STYLE: B, TRANSMITTER S/N 2692435, AMPLIFIER NO. 148ND
INPUT RANGE: 0-2000.16 ft/in² OUTPUT LOAD: 6500
TEST NO. 13-1013 DATE: APRIL 1973
SPRAY CONDITIONS: BORIC ACID SOLUTION WITH 9.25 GPH
FOR 2 HRS THEN DROP TO 8.5 PH (MIN)
SPRAY RATE: 11ph/ft²



NOTE: READINGS CORRECTED
FOR REF. UNIT

RODH. TEMP
1675°F

1.5.10
 DE EQUIP.
 1 page
 23
 30

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
PLANT ID NO: <i>NA</i>	Temperature (°F)	<i>Fig 20-27</i>	<i>NA</i>	<i>FSAR APP 0</i>	<i>NA</i>	<i>NA</i>	<i>None</i>
COMPONENT: <i>INSTR. Termination</i>	Pressure (PSIA)	<i>Fig 20-27</i>	<i>NA</i>	<i>FSAR APP 0</i>	<i>NA</i>	<i>NA</i>	<i>None</i>
MANUFACTURER: <i>NA</i>	Relative Humidity (%)	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
MODEL NUMBER: <i>Termination At Mercoid Instr.</i>	Chemical Spray	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
FUNCTION:	Radiation (10 ⁶ rads)	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
LOCATION: <i>Outside Containment</i>							
FLOOD LEVEL ELEV: <i>NA</i> ABOVE FLOOD LEVEL: <i>NA</i>							

*Documentation References:

*Mercoid switch to be replaced
 Termination to be qualified with Instr.*

Notes: INCLUDED IN FIRST 79-018 SUBMITTAL DUE TO POSSIBLE SOURCE/TARGET INTERACTION. SUBSEQUENT REVIEW USING ACCEPTANCE CRITERIA OF FSAR APPENDIX D FOR PRODUCTION OF ELECTRICAL EQUIPMENT SHOWS NO SOURCE/TARGET INTERACTION.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>Aux Feedwater</i>	Operating Time	<i>4mo.</i>	<i>Note (L)</i>		<i>Note (L)</i>	<i>Note (L)</i>	<i>None</i>
PLANT ID NO: <i>N/A</i>	Temperature (°F)	<i>230</i>					<i>None</i>
COMPONENT: <i>Inst. Cable</i> <i>TERM of FFI-210, -220, -230</i>	Pressure (PSIA)	<i>26.2</i>					<i>None</i>
MANUFACTURER: <i>-240</i> <i>N/A</i>	Relative Humidity (%)	<i>100</i>	↓		↓	↓	<i>None</i>
MODEL NUMBER:	Chemical Spray	<i>NA</i>					<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>NA</i>					<i>None</i>
ACCURACY: SPEC: <i>N/A</i> DEMON: <i>N/A</i>	Aging (years)						<i>None</i>
SERVICE: <i>VARIOUS</i>							
LOCATION: <i>Outside Cont.</i>							
FLOOD LEVEL ELEV: ABOVE FLOOD LEVEL: <i>N/A</i>	Submergence	<i>NA</i>					<i>None</i>

*Documentation References:

Notes:

4) Qual. Test. Program for Utility Transmitters. Equipment passed the Test. Test report not yet completed.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 yr	> 1.1 yrs	Table 7.5-2	63 13	Combination	None
PLANT ID NO: NA	Temperature (°F)	Fig 022.9-1, -2	340	FSAR APP Q	13	SEP.	None
COMPONENT: <i>Power CABLE TERMINATION</i>	Pressure (PSIA)	Fig 1 Fig 2	118	APP Q	13	SEP.	None
MANUFACTURER: NA	Relative Humidity (%)	100	100		13	SEP.	None
MODEL NUMBER: SOLID KAPTON SPLICED TO STRANDED KAPTON	Chemical Spray	Not Req'd	2500 ppm B.T.S. 1.93 wt % Boron ph 9.5	314.5 314.5.6	13	SEP.	None
FUNCTION: CABLE Connection	Radiation (10 ⁶ rads)	60	150	AEW 729	13	SEP.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	submerged	FLOODUP Tubes		61	Combination	None
LOCATION: <i>IN Containment</i>							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: <i>No</i>							

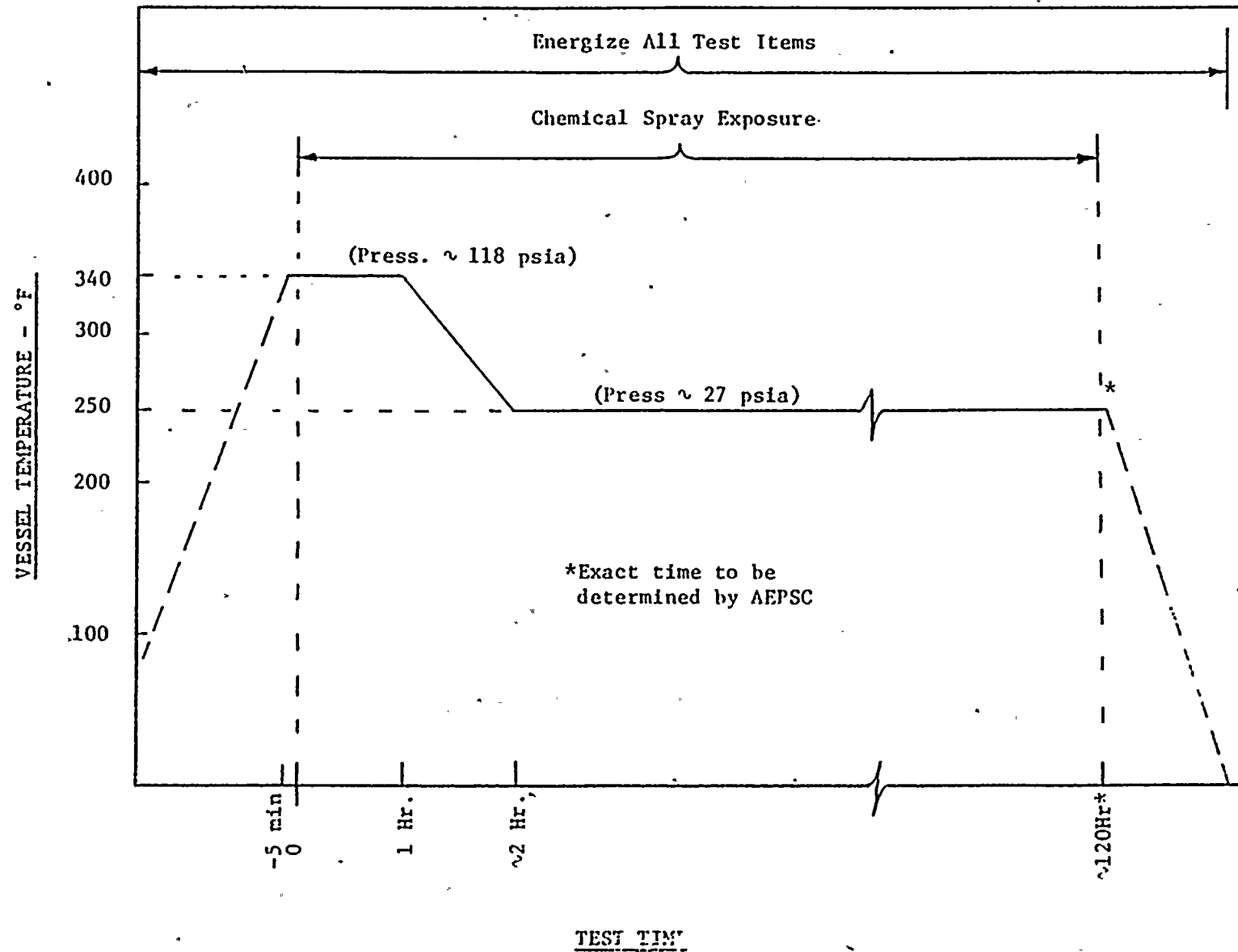
*Documentation References:

Notes:

13. Westinghouse-CANADA Test Report CWAPD-332

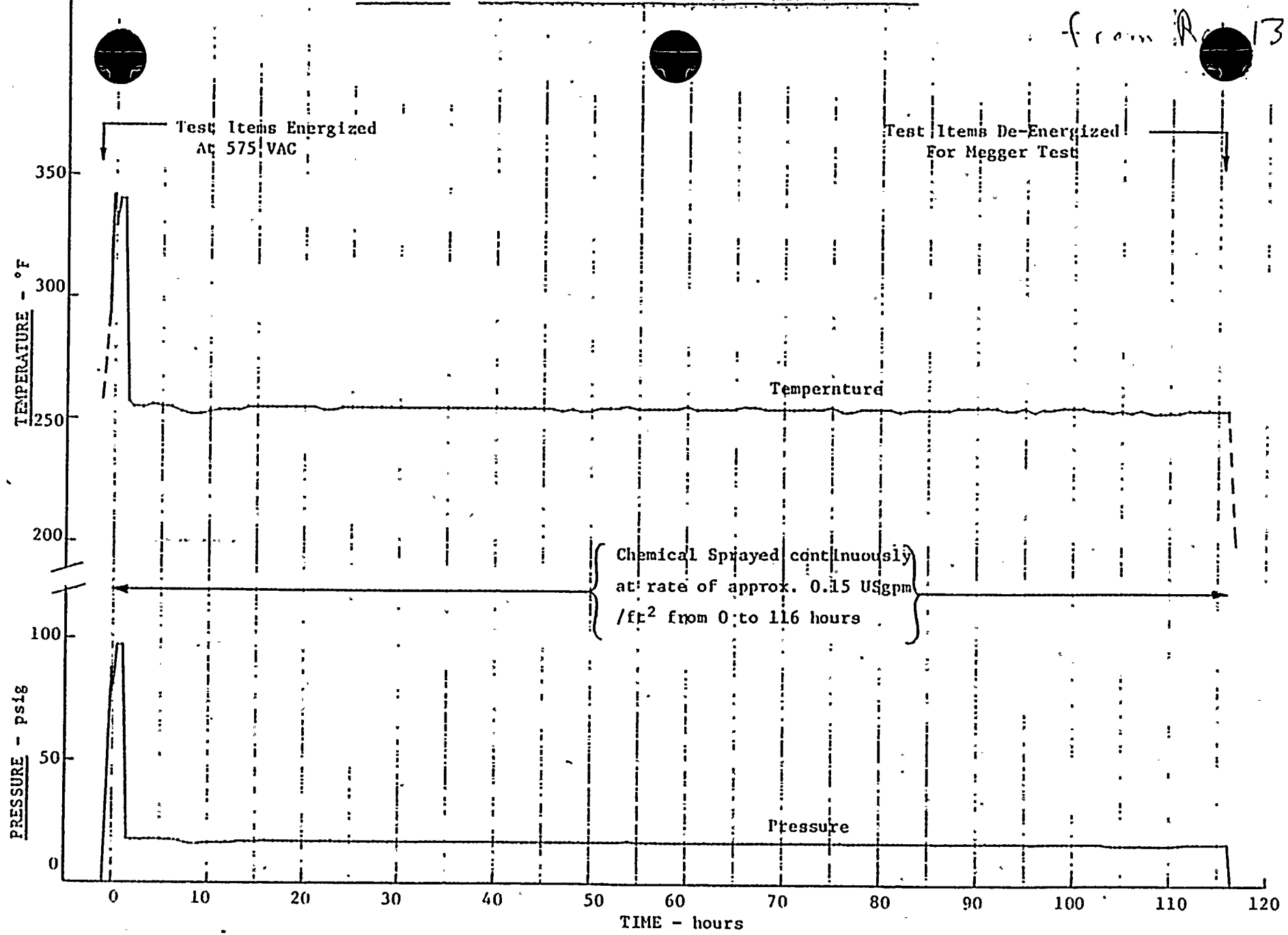
61. Floodup Tube Qual. Packet

63. Req'd Time Qual. Analysis



Page 1 of 2

from A-13



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 yr.	71.1 yr	Table 715-2	63 13	Combination	None
PLANT ID NO: NA	Temperature (°F)	FIG 022.9-1, 2	340	FSAR APP 9	13	Seq.	None
COMPONENT: TERMINATION	Pressure (PSIA)	FIG 2 FIG 1	118	AEW 6504	13	Seq.	None
MANUFACTURER: NA	Relative Humidity (%)	100	100		13	Seq.	None
MODEL NUMBER: STRANDED KAPTON SPLICED TO STRANDED KAPTON	Chemical Spray	Not Req'd	2500 ppm T.S. 1.43 wt % 314.5 ph 9.5 Acid 314.56		13	Seq.	None
FUNCTION: CABLE CONNECTION	Radiation (10 ⁶ rads)	150	150	WCAP 7410-L VOL 1	13	Seq.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: IN CONTAINMENT							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: YES							

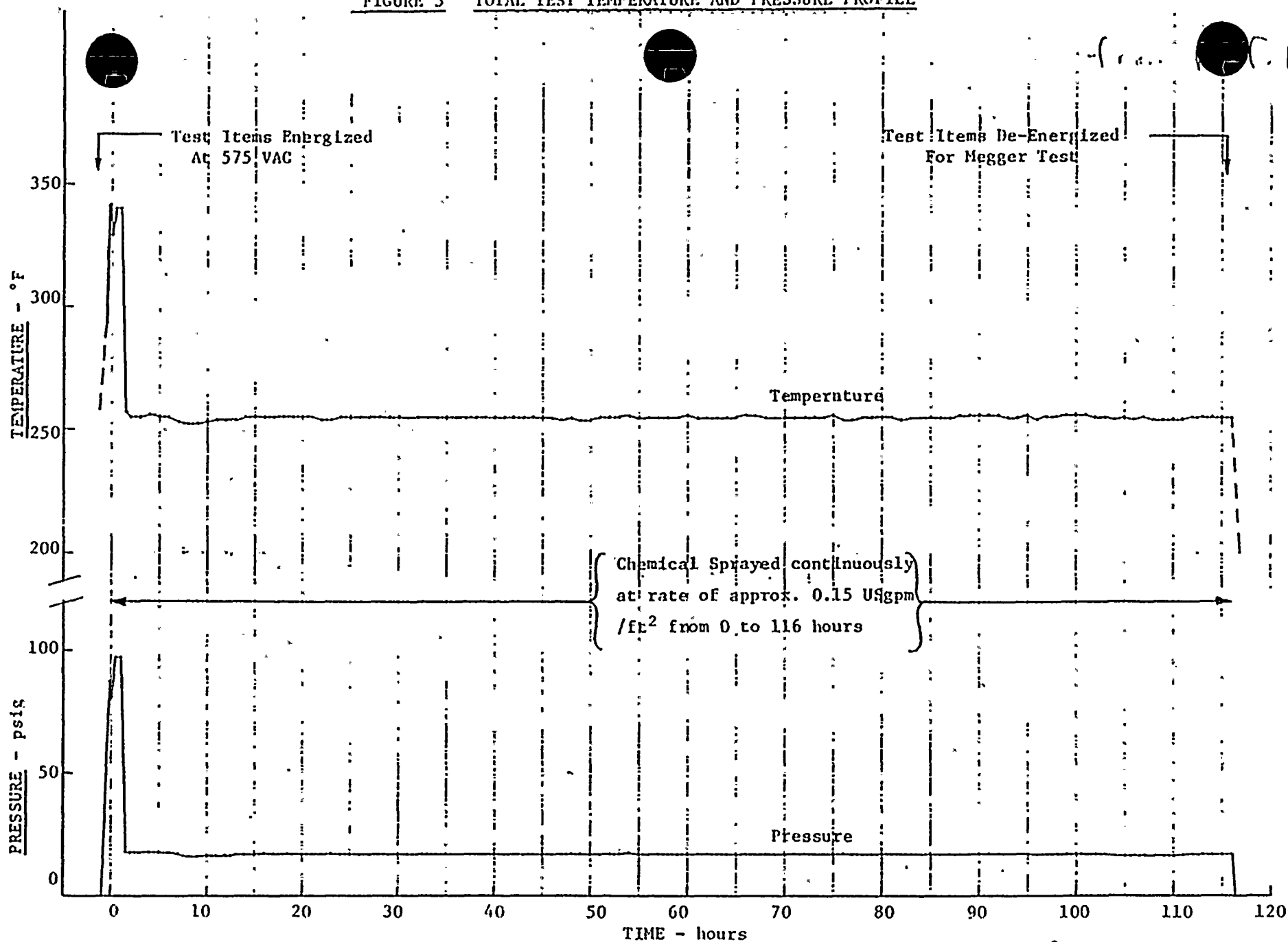
*Documentation References:

Notes:

- 13. Westinghouse - CANADA Test Report CWAPD - 332
- 63. Req'd Time Qual. Analysis

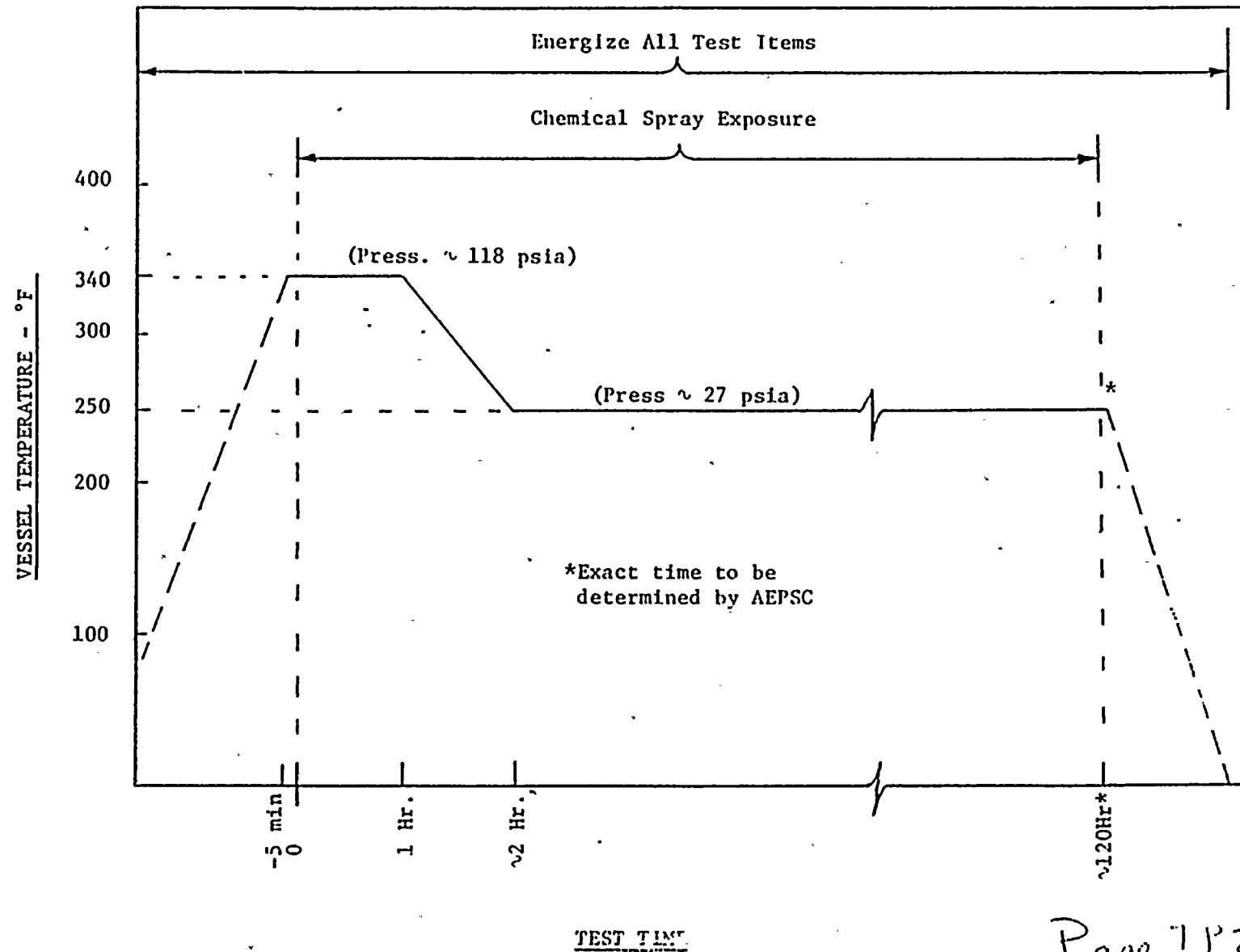


FIGURE 3 TOTAL TEST TEMPERATURE AND PRESSURE PROFILE





Flow Ref. 157





EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 year</i>	<i>> 1.1 yr</i>	<i>Table 7.5-2</i>	<i>63 13</i>	<i>Combination</i>	<i>None</i>
PLANT ID NO: <i>NA</i>	Temperature (°F)	<i>FIG 022.9-1,-2</i>	<i>340</i>	<i>FSAR APP Q</i>	<i>13</i>	<i>SEP.</i>	<i>None</i>
COMPONENT: <i>TERMINATION</i>	Pressure (PSIA)	<i>FIG 2 FIG 1</i>	<i>118</i>	<i>AEP 6504</i>	<i>13</i>	<i>SEP.</i>	<i>None</i>
MANUFACTURER: <i>NA</i>	Relative Humidity (%)	<i>100</i>	<i>100</i>		<i>13</i>	<i>SEP.</i>	<i>None</i>
MODEL NUMBER: <i>TERMINATION AT VALVE MOTOR OPERATORS, Hydrogen Recombiner, FAN Motors</i>	Chemical Spray	<i>2000 ppm B 1.14 wt % Boric 0.9-1.1 Acid</i>	<i>2500 ppm B 1.43 wt % Boric 0.9-1.5 Acid</i>	<i>T.S. 314.5 314.5.6</i>	<i>13</i>	<i>SEP.</i>	<i>None</i>
FUNCTION: <i>CABLE Connection</i>	Radiation (10 ⁶ rads)	<i>150</i>	<i>150</i>	<i>WCAP 7410-L Vol 1</i>	<i>13</i>	<i>SEP.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>	Submergence	<i>submerged</i>	<i>See note below.</i>				<i>None</i>
LOCATION: <i>IN + Out of Containment</i>							
FLOOD LEVEL ELEV: <i>612'</i> ABOVE FLOOD LEVEL: <i>NO</i>							

*Documentation References:

13. WESTINGHOUSE - CANADA TEST REPORT CWAPD-332
63. Req'd Time Qual. Analysis

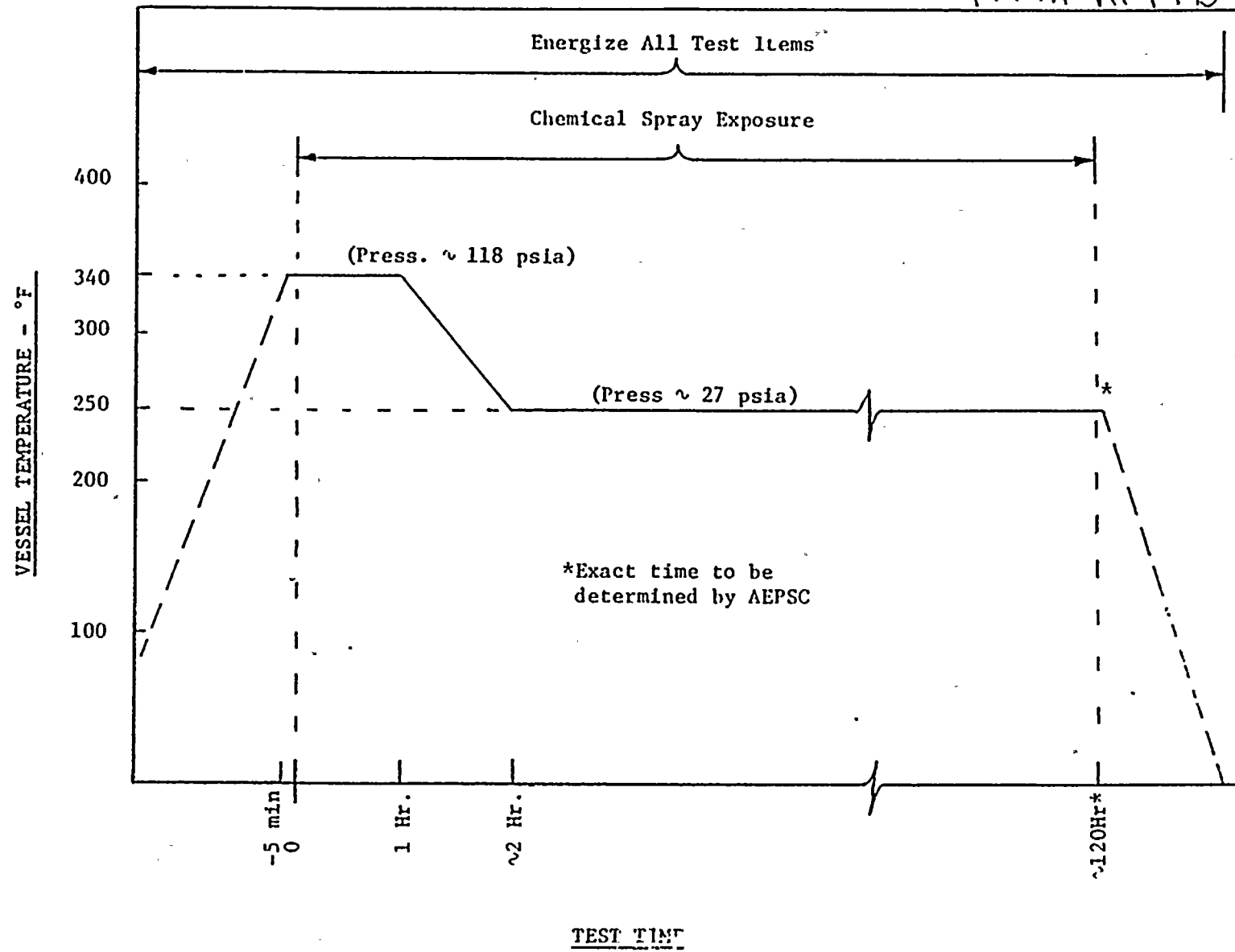
Notes:

These power cable terminations inside containment which may be submerged after a LOCA serve certain valve motor operators. The safety significance of this submergence is discussed in FSAR, App. Q, response to question 40.10 and in Item 4 of letter from J. Tillinghast (AEP) K. Kniel (NRC) of 9-29-75. Page TP 3-1

FIGURE 2

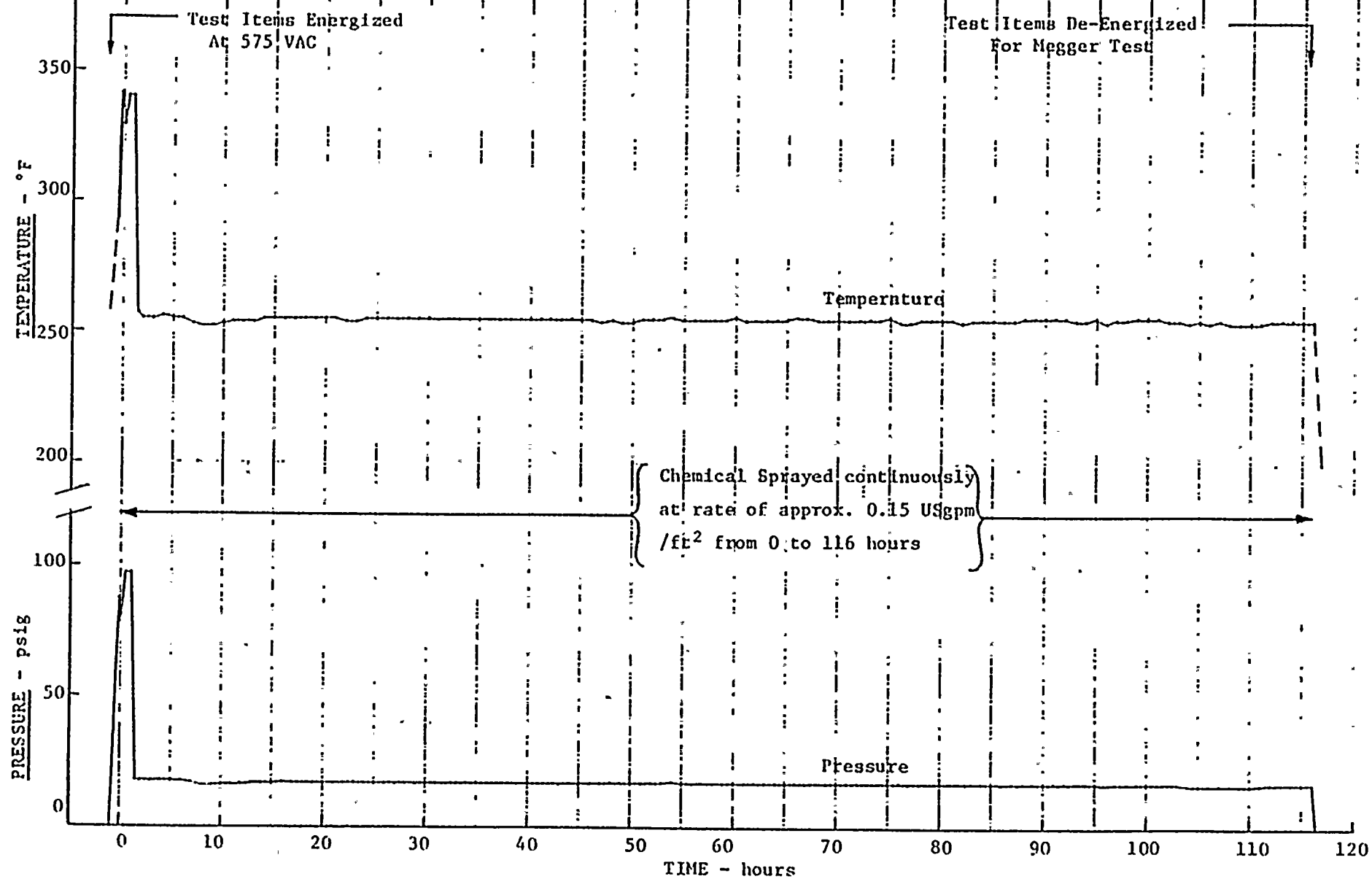
TEST PROFILE

from Ref. 13



172





EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: VARIOUS	Operating Time	1 year	5.1 yr		13 63	Combination	None
PLANT ID NO: NA	Temperature (°F)	NA	NA	NA	NA	NA	NA
COMPONENT: CABLE Term	Pressure (PSIA)	NA	NA	NA	NA	NA	NA
MANUFACTURER: NA	Relative Humidity (%)	NA	NA	NA	NA	NA	NA
MODEL NUMBER: Power Cable Term at Pump Motor	Chemical Spray	NA	NA	NA	NA	NA	NA
FUNCTION: VARIOUS	Radiation (10 ⁶ rads)	16.6	150	See Note A	13	Seq	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: VARIOUS	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: Outside Containment							
FLOOD LEVEL ELEV: NA							
ABOVE FLOOD LEVEL: NA							

*Documentation References:

Notes:

13. Westinghouse Canada Test Report CWAPD-332

A) NS&L calculation DC-10-6420-2
ref 59

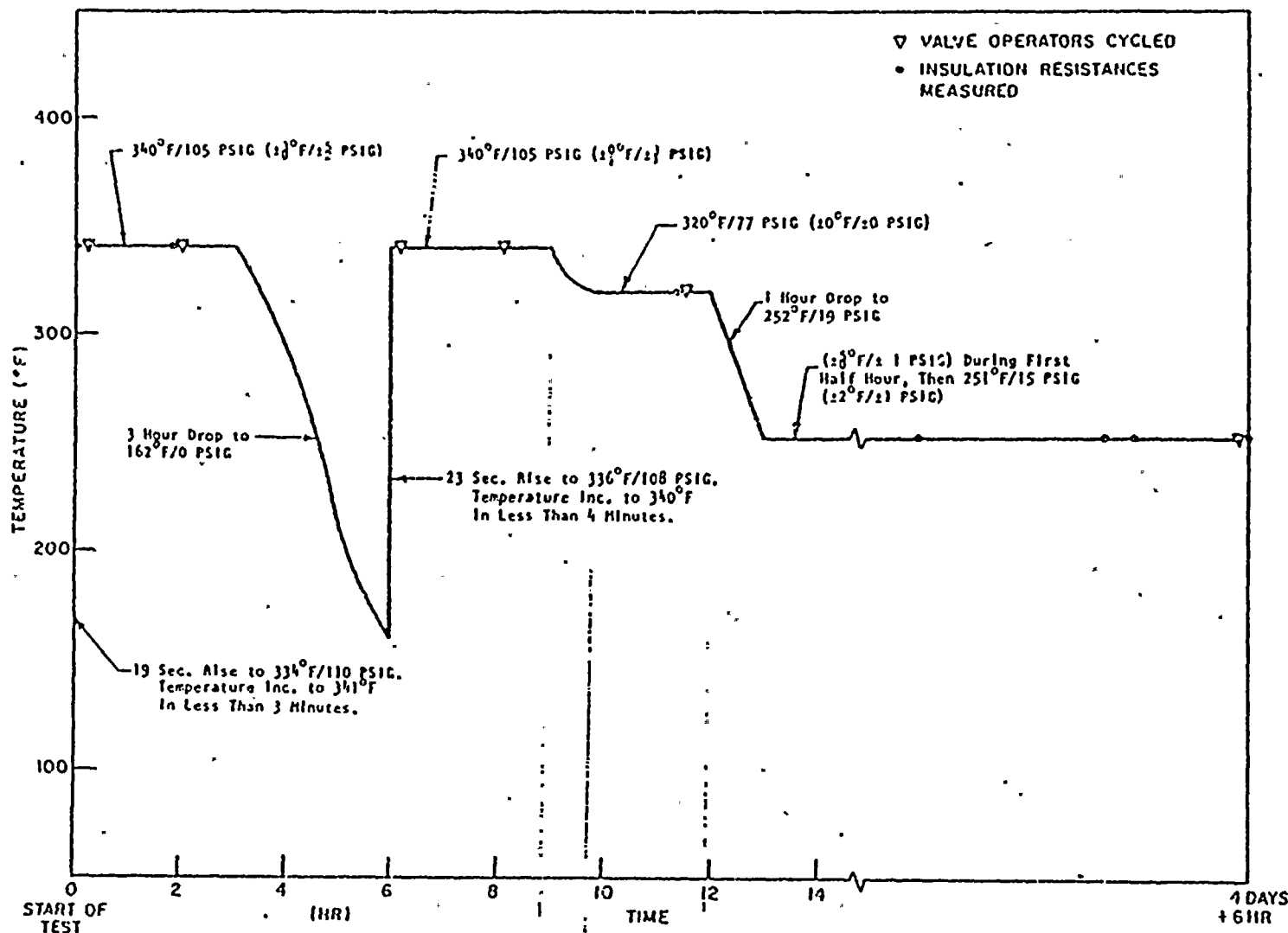
EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CVCS, RHR	Operating Time	1 HR.	30 DAYS	Table 15-2	23	Sep	None
PLANT ID NO: 1 Mo-51, 52, 53, 54; 128; ICM-III, -129	Temperature (°F)	Fig 022.9-1, -2	340	FSAR App Q	23	SEP.	None
COMPONENT: VALVE MOTOR OPERATOR MANUFACTURER: LIMITORQUE	Pressure (PSIA)	FIG. 2 Fig 1	119.7	APP Q 6504	23	SEP.	None
MODEL NUMBER: SMB-1 SMB-00 SMB-2	Relative Humidity (%)	100	100		23	SEP.	None
FUNCTION: Core Cooling and Containment Isolation ACCURACY: SPEC: NA DEMON: NA	Chemical Spray	2000 ppm B 1.14 wt % Boric ph 9-11 Acid	2400 ppm B 1.5 wt % Boric ph 7.67 Acid	T.S. 314.5 314.5.6	22	SIMUL.	None
SERVICE: ECCS injection and RHR normal cooling	Radiation (10 ⁶ rads)	2.2	204	WCAP 1410-L Vol 1	23	SEP.	None
LOCATION: INSIDE Containment	Aging (years)						
FLOOD LEVEL ELEV: 612' ABOVE FLOOD LEVEL: No	Submergence	submerged	Yes *		23	Sep.	None

*Documentation References:

22. Limitorque Corp Test Report #600198
23. Limitorque Corp. Test Report #600376A

Notes: See also FSAR App. Q response to question 40.10 and letter from J. Tillinghast (AEP) to K. Knier (NRC) dated 9-29-75 (Item 4).





from Ref. 23

F-C3441

Figure 3. Actual Steam Exposure Profile

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Safety Injection	Operating Time	1 Day	30 DAYS	Note A below	16	Seq	None
PLANT ID NO: 1M0-315, 316, 325, 326	Temperature (°F)	Fig 13.13-1 2	315	FSAR APP D	16	SEQ.	None
COMPONENT: VALVE MOTOR OPERATOR	Pressure (PSIA)	Fig 1 Fig 2	84.7	Acc 6504	16	SEQ.	None
MANUFACTURER: LIMITORQUE	Relative Humidity (%)	100	100		16	SEQ.	None
MODEL NUMBER: SMB-1	Chemical Spray	2000 ppmB 1.14 wt % Boric ph 9-11 Acid	2000 ppmB 1.72 wt % Boric ph 10.5 Acid	TIS. 314.5 311.5.6	16	SEQ	None
FUNCTION: Switchover to hot leg Injection	Radiation (10 ⁶ rads)	28	204	WCAP 7410-L UOL	16	SEQ.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: ECCS Safety Injection	Submergence	NA	NA	NA	NA	NA	None
LOCATION: INSIDE Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: yes							

*Documentation References:

16. Limitorque Corp. Test Report # 600456

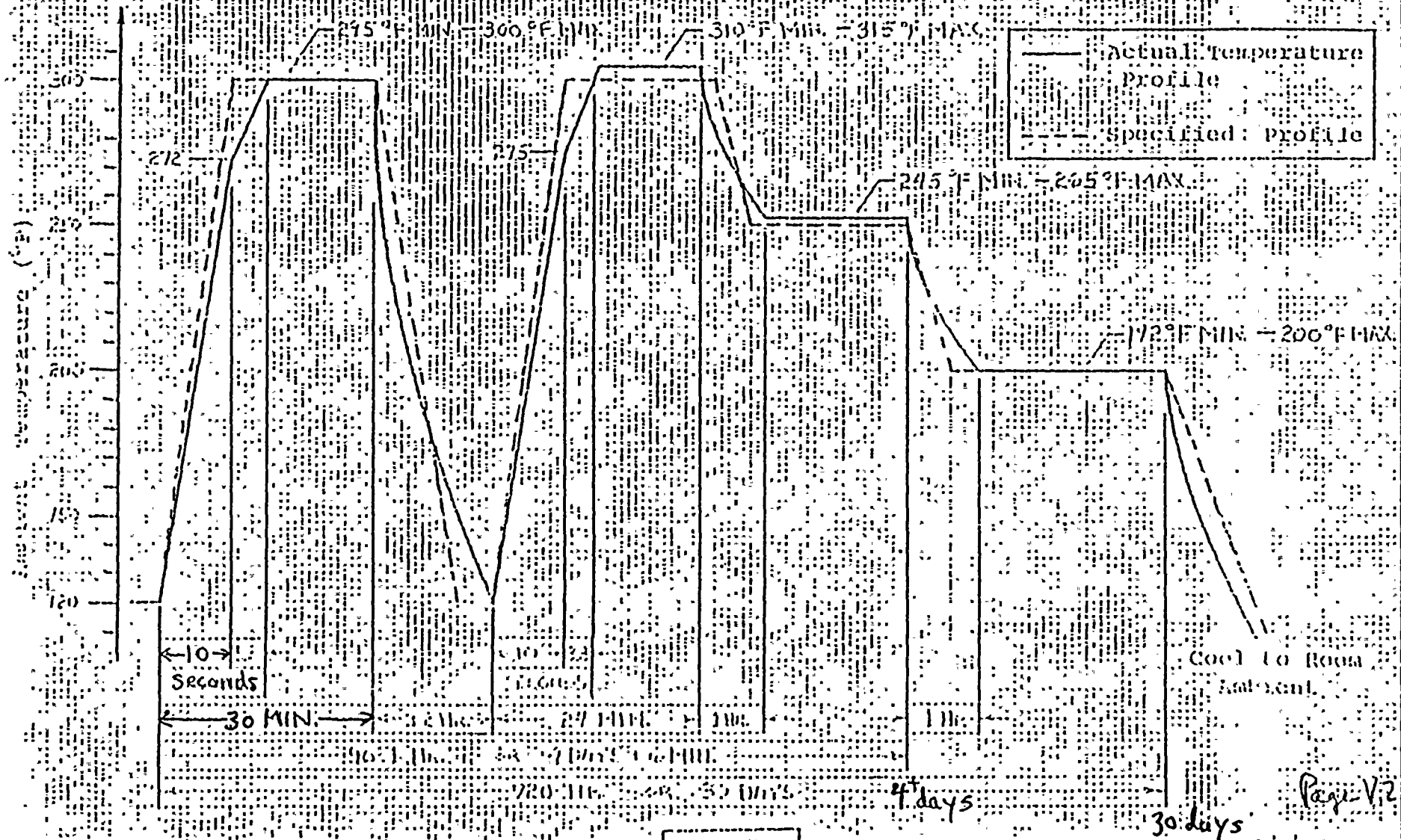
Notes:

A) letters J. Tillinghast (AEP) to K. Knie (NRC) dated 4-14-75 and 9-29-75.



from Ref. 16

ACTUAL ACCIDENT PROFILE



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Containment Air Recirculation	Operating Time	1 HR	16 DAYS	FSAR Table 7.5-2	24	Seq	None
PLANT ID NO: VMO-101,102	Temperature (°F)	Fig 13.13-1	250	FSAR APP N	24	SEQ.	None
COMPONENT: VALVE MOTOR OPERATOR	Pressure (PSIA)	FIG 2 Fig 1	39.7	FSAR 6504	24	SEQ.	None
MANUFACTURER: LIMITORQUE	Relative Humidity (%)	100	100		24	SEQ.	None
MODEL NUMBER: SMB-000	Chemical Spray	See Note A	NA	See Note B	NA	NA	NA
FUNCTION: CT air recirc. backdraft dampers	Radiation (10 ⁶ rads)	4	224	WCAP 7410-L VOL 1	24	SEQ.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: CT air recirc. backdraft dampers	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: INSIDE Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: Yes							

*Documentation References:

24. Limitorque Corp. Test Report #600461

Notes:

- A) Valve location is not subject to direct cosmetic spray impingement.
- B) mech. installation drawings 1-5427



TEMPERATURE PROFILE

from Ref. 24

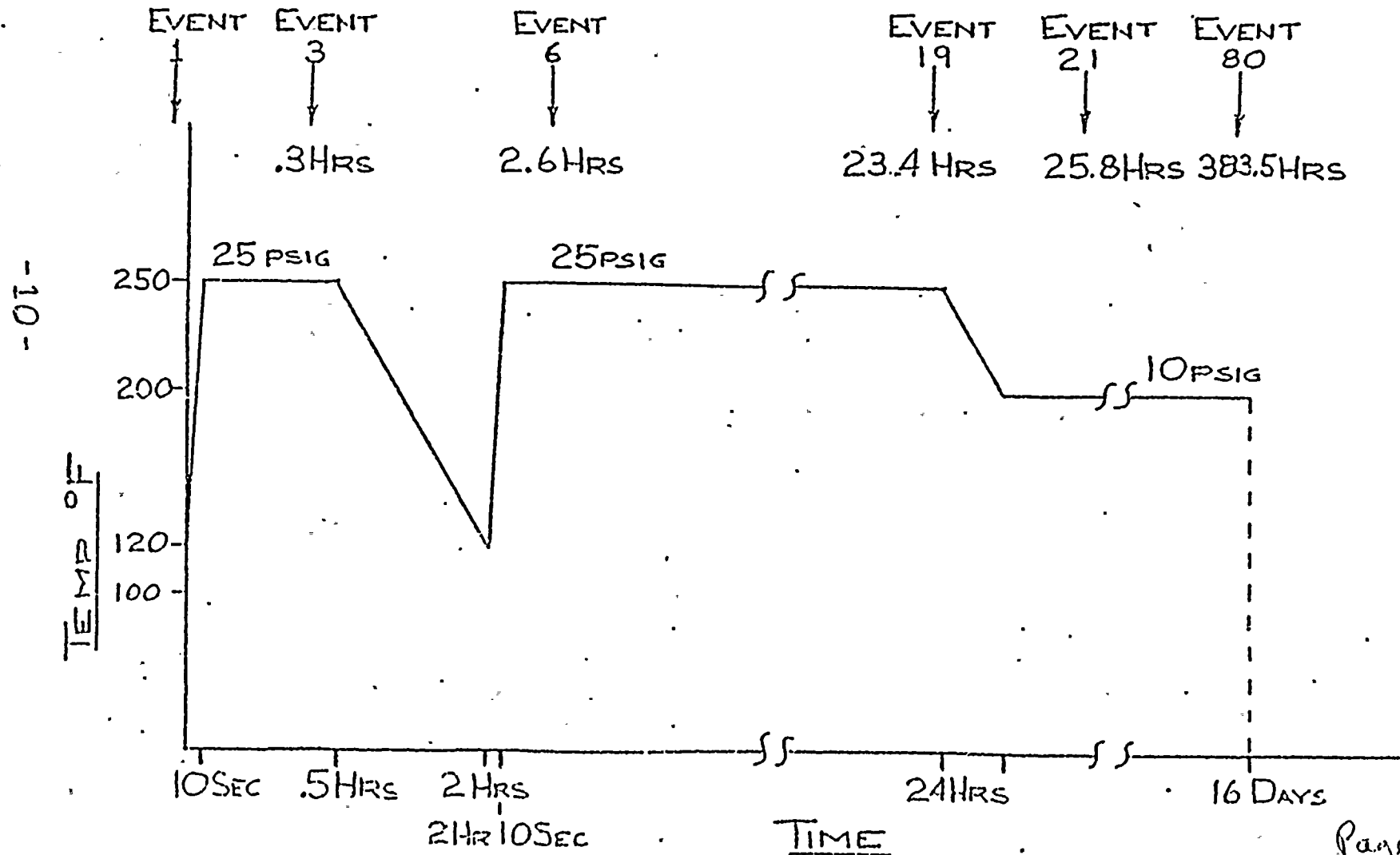


FIGURE 1



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: CVCS	Operating Time	1 hr	7 DAYS	Table 7.5-2	22	Simul.	None
PLANT ID NO: QCM-250	Temperature (°F)	Fig 13.13-1	330	FSAR APP N	22	SIMUL.	None
COMPONENT: VALVE MOTOR OPERATOR	Pressure (PSIA)	FIG 2 Fig 1	104.7	AEW 6504	22	SIMUL.	None
MANUFACTURER: LIMITORQUE	Relative Humidity (%)	100	100		22	SIMUL.	None
MODEL NUMBER: SMB-00	Chemical Spray	2000 ppm B, 1.14 wt % Boric acid, pH 9-11	2600 ppm B, 1.5 wt % Boric acid, pH 7.67	T.S. 314.5, 314.5.6	22	SIMUL.	None
FUNCTION: RCP seal water CT Isolation	Radiation (10 ⁶ rads)	SEE NOTE B	BELOW			NA	NA
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: RCP seal water discharge	Submergence	See Note A	See Note A		NA	NA	NA
LOCATION: Inside Containment							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: No							

*Documentation References:

22. Limitorque Corp Test Report # 600198

Notes:

- A) Communication of 9-29-75 from J. Tillinghast (AEP) to K. Kniel (WEC). See also question 40.10, App. Q, FSAR.
- B) This valve closes within 15 sec. (Tech Spec. Table 3.6-1) of receiving a Phase A CT isolation signal, therefore is not exposed to a radiation dose significantly beyond its normal environment and Page V5-1 does not require radiation qualification.



from Ref. 22. Qualified by Limitorque Corp. Test Laboratory
Project #600198. November 1968

22
92
Type of Test: simultaneous, steam
chemical spray
separate seismic test

Type Profile:

328°F, 90 psig for 1 hr
312°F, 70 psig for 2 hrs
287°F, 40 psig for 2 hrs
271°F, 20 psig for 19 hrs
250°F, 15 psig for 6 days

Chemical Spray:

1.5% boric acid buffered with Na OH to a PH of 7.67.

Seismic Test 8/20/79

Horizontal Force, 5.3 G at 35 Hz
Vertical force 5.3 G at 35 Hz
No resonance freq from 5 to 35 Hz

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 day</i>	<i>16 DAYS</i>	<i>Note A below</i>	<i>24</i>	<i>Seq</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 0-27</i>	<i>250</i>	<i>FSAR AFO</i>	<i>24</i>	<i>SEQ.</i>	<i>None</i>
COMPONENT: <i>VALVE Motor Operator</i> MANUFACTURER: <i>Limitorque</i>	Pressure (PSIA)	<i>Fig. 0-27</i>	<i>39.7</i>	<i>FSAR AFO</i>	<i>24</i>	<i>SEQ.</i>	<i>None</i>
MODEL NUMBER: <i>VARIOUS</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>	<i>NA</i>	<i>24</i>	<i>SEQ.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Chemical Spray	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Radiation (10 ⁶ rads)	<i>4/1</i>	<i>224</i>	<i>Note B below</i>	<i>24</i>	<i>SEQ.</i>	<i>None</i>
SERVICE: <i>VARIOUS</i>	Aging (years)						
LOCATION: <i>Outside CONTAINMENT</i>							
FLOOD LEVEL ELEV: <i>NA</i> ABOVE FLOOD LEVEL: <i>NA</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>

***Documentation References:**

24. Limitorque Corp Test Report #600461

Notes:

Notes:
A) letters J. Tillinghast (AEP) to K. Knier (NRG)
dated 4-14-75 and 9-29-75.

B) AEPSC NSRL calculation DC-N-6420-2.



TEMPERATURE PROFILE

from Ref. 24

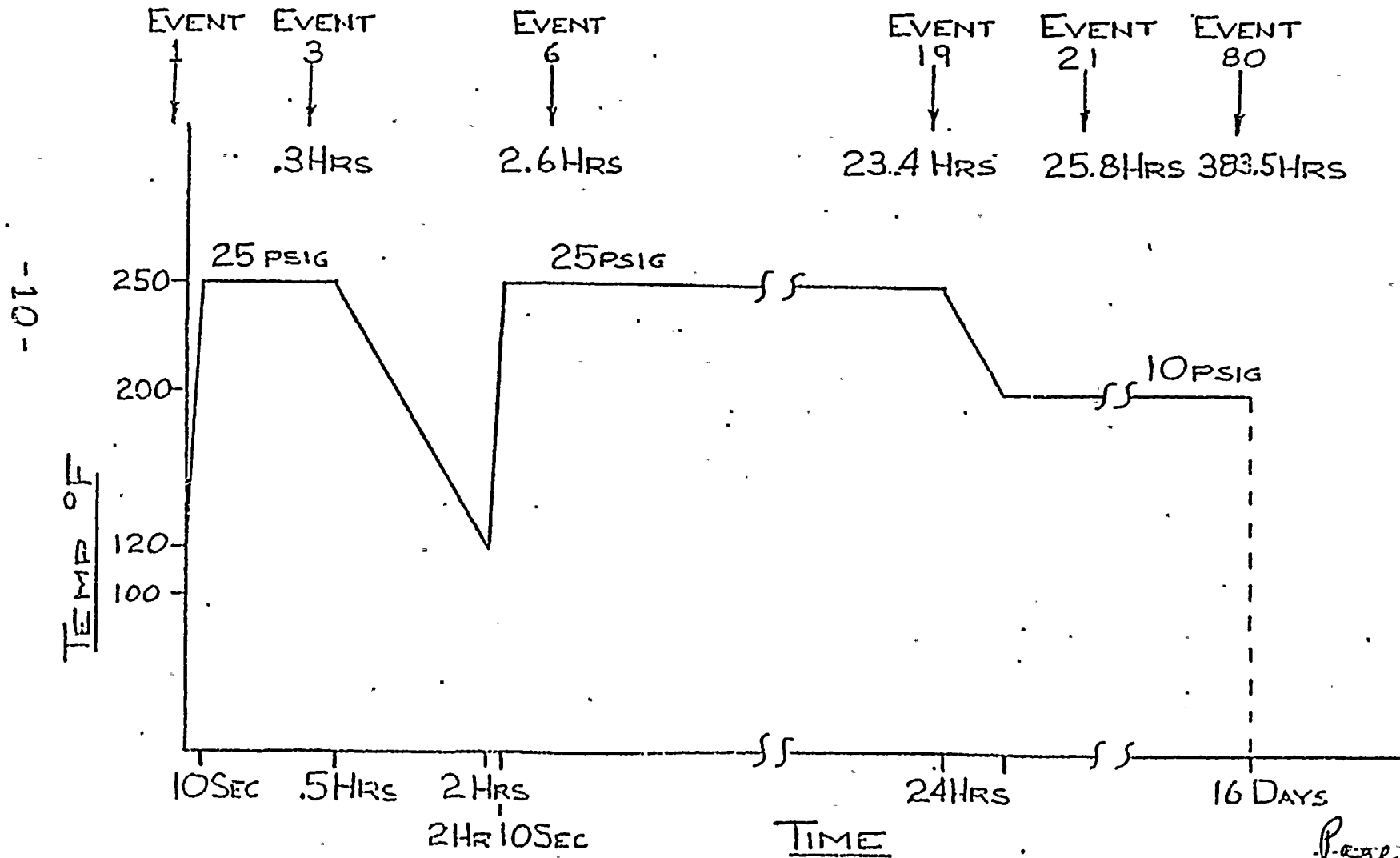


FIGURE 1



EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 day</i>	<i>30 DAYS</i>	<i>NA</i>	<i>23</i>	<i>Sep</i>	<i>None</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>Fig 0-27</i>	<i>340</i>	<i>F_{SA}R</i>	<i>23</i>	<i>SEP.</i>	<i>None</i>
COMPONENT: <i>VALVE Motor Operator</i>	Pressure (PSIA)	<i>Fig 0-27</i>	<i>119.7</i>	<i>F_{SA}R</i>	<i>23</i>	<i>SEP.</i>	<i>None</i>
MANUFACTURER: <i>Limitorque</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>		<i>23</i>	<i>SEP.</i>	<i>None</i>
MODEL NUMBER: <i>VARIOUS</i>	Chemical Spray	<i>NA</i>	<i>2600 ppm 1.5wt% H₂O₂ - 1c Ph 7.67 Acid</i>	<i>NA</i>	<i>22</i>	<i>Simul.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Radiation (10 ⁶ rads)	<i>4/1</i>	<i>204</i>	<i>AEPSC NS&L calc. DC-N- 6420-2</i>	<i>23</i>	<i>Sep.</i>	<i>None</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Aging (years)						
SERVICE: <i>VARIOUS</i>							
LOCATION: <i>Outside Containment</i>							
FLOOD LEVEL ELEV: <i>NA</i> ABOVE FLOOD LEVEL: <i>NA</i>	Submergence	<i>NA</i>	<i>Yes</i>	<i>NA</i>	<i>23</i>	<i>Sep.</i>	<i>None</i>

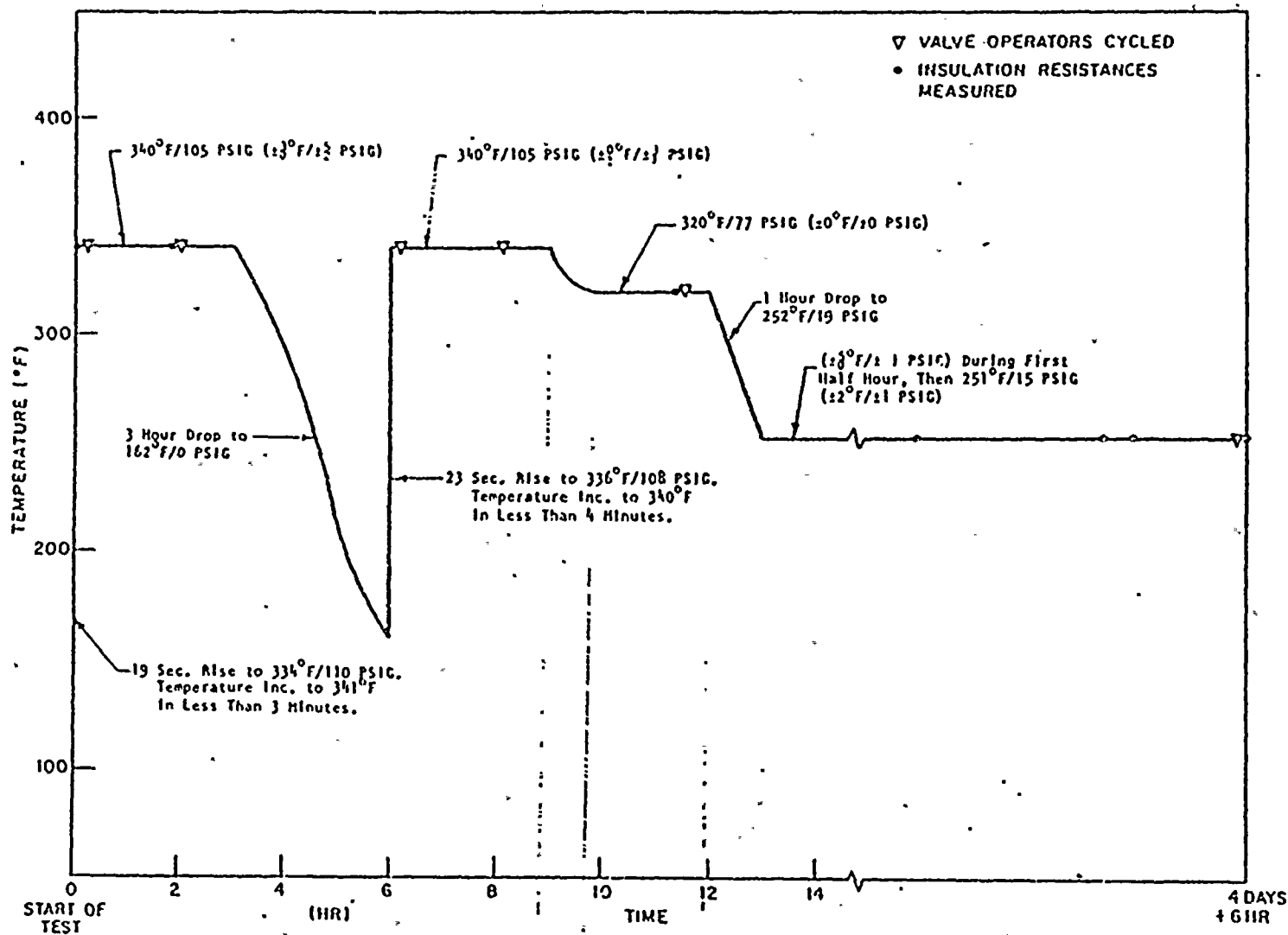
*Documentation References:

22. Limitorque Corp Test Report #600198
23. Limitorque Corp Test Report # 600376A

Notes:

A) letters J. Tillinghast (AEP) to K. Kniel (NRC)
dated 4-14-75 and 9-29-75.





Ref. 23.

F-C3441

Figure 3. Actual Steam Exposure Profile

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: <i>VARIOUS</i>	Operating Time	<i>1 DAY</i>	<i>> 1 DAYS</i>	<i>Note A below</i>	<i>LB 44</i>	<i>Combination</i>	<i>none</i>
PLANT ID NO: <i>VARIOUS</i>	Temperature (°F)	<i>FIG 0-27</i>	<i>212</i>	<i>F SAR APP 0</i>	<i>44</i>	<i>SEQ.</i>	<i>None</i>
COMPONENT: <i>Valve Motor Operator</i> MANUFACTURER: <i>Limitorque</i>	Pressure (PSIA)	<i>FIG 0-27</i>	<i>14.7</i>	<i>F SAR APP 0</i>	<i>44</i>	<i>SEQ</i>	<i>None</i>
MODEL NUMBER: <i>VARIOUS</i>	Relative Humidity (%)	<i>NA</i>	<i>100</i>		<i>44</i>	<i>SEQ.</i>	<i>None</i>
FUNCTION: <i>VARIOUS</i>	Chemical Spray	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
ACCURACY: SPEC: <i>NA</i> DEMON: <i>NA</i>	Radiation (10 ⁶ rads)	<i>4.5</i>	<i>See Valve Motor Operator Note 1</i>	<i>ALPSC NSL CALL DC-N-6420-2</i>		<i>SEE ATTACH. #1 VALVE MOTOR SPEC NOTE 1</i>	<i>None</i>
SERVICE: <i>VARIOUS</i>	Aging (years)						
LOCATION: <i>Outside Containment</i>							
FLOOD LEVEL ELEV: <i>NA</i> ABOVE FLOOD LEVEL: <i>NA</i>	Submergence	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>

T.D. 136
OF EQUIP.
(Page)
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41-42
64
68-70
91-92
210-211

*Documentation References:

44. FIRC TEST Report F-C3271
63. Req'd Time Qual. Analysis

Notes:

A) Letters from J. Tillinghast (AEP) to K. Kniel (NRC)
dated 4-14-75 and 7-29-75.

REV. 1 9/2/80

Page V8-1

44.

THE FLAVIN INSTITUTE RESEARCH LABORATORIES

3-6

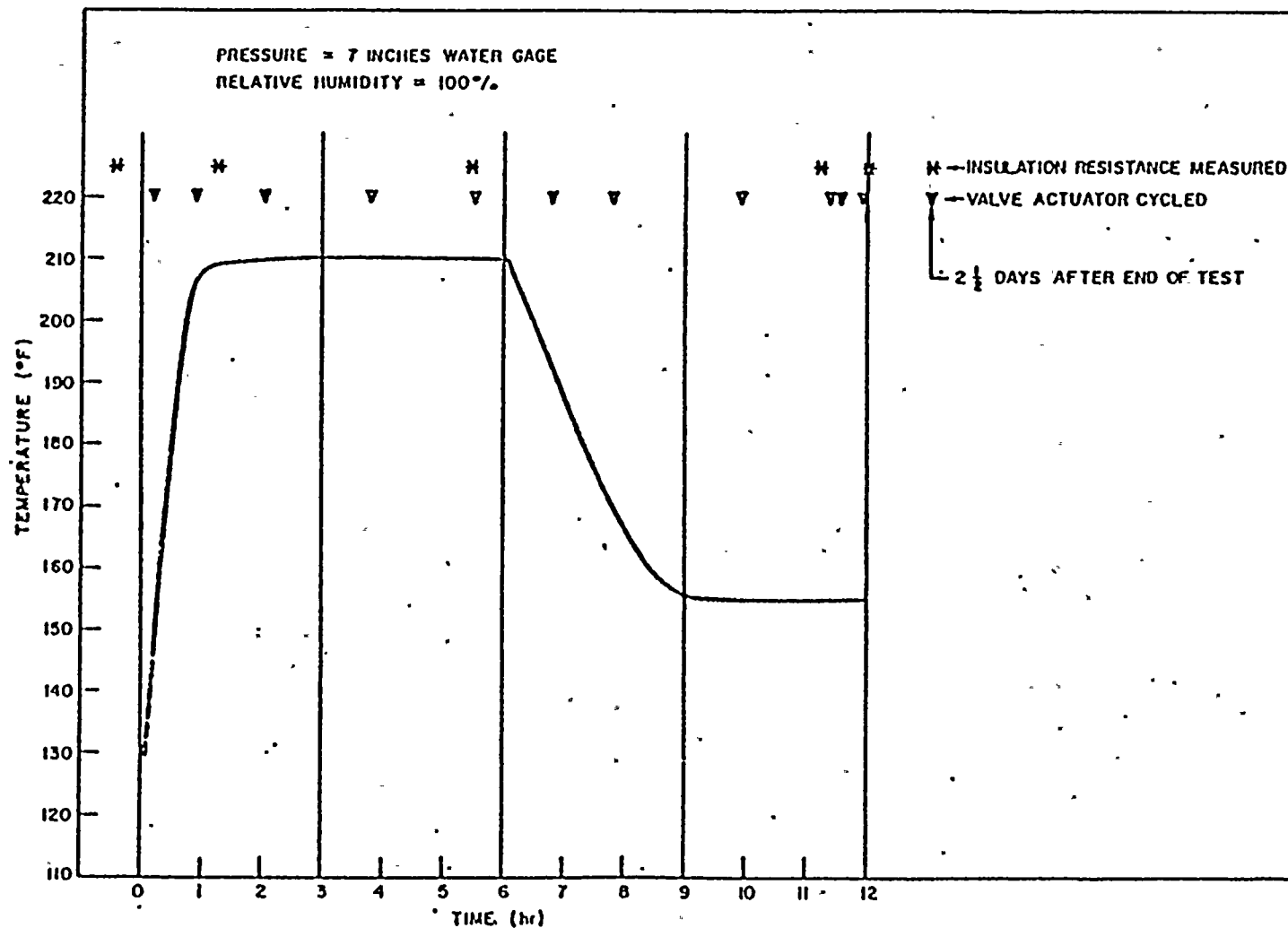


Figure 3. Test Profile

F-C3271

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Pressurizer	Operating Time	1 DAY	16 DAYS		24	Seq.	None
PLANT ID NO: N/10-151, 152, 153	Temperature (°F)	FIG 022.9-1-2	250	FSAE APP Q	24	Seq.	None
COMPONENT: Valve Motor Operator MANUFACTURER: Limitorque	Pressure (PSIA)	FIG. 2 FIG 1	39.7	AEW 6504	24	Seq.	None
MODEL NUMBER: SMB-00	Relative Humidity (%)	100	100		24	Seq.	None
FUNCTION: PZR PORV Block Valves ACCURACY: SPEC: NA DEMON: NA	Chemical Spray	See Note A	NA	See Note B	NA	NA	NA
SERVICE: PZR relief line	Radiation (10 ⁶ rads)	28	224	WCAP 7410-L Vol 1	24	Seq.	None
LOCATION: IN Containment	Aging (years)				4		
FLOOD LEVEL ELEV: 612' ABOVE FLOOD LEVEL: Yes	Submergence	NA	NA	NA	NA	NA	NA

*Documentation References:

24. Limitorque Corp Test Report #600461

Notes:

A) Valve Location is not subjected to Direct Caustic Spray impingement.

B) Mech. Drawing Ref. 1-5435
Installation drawing. 1-5435A
1-5436

TEMPERATURE PROFILE

from Ref. 24

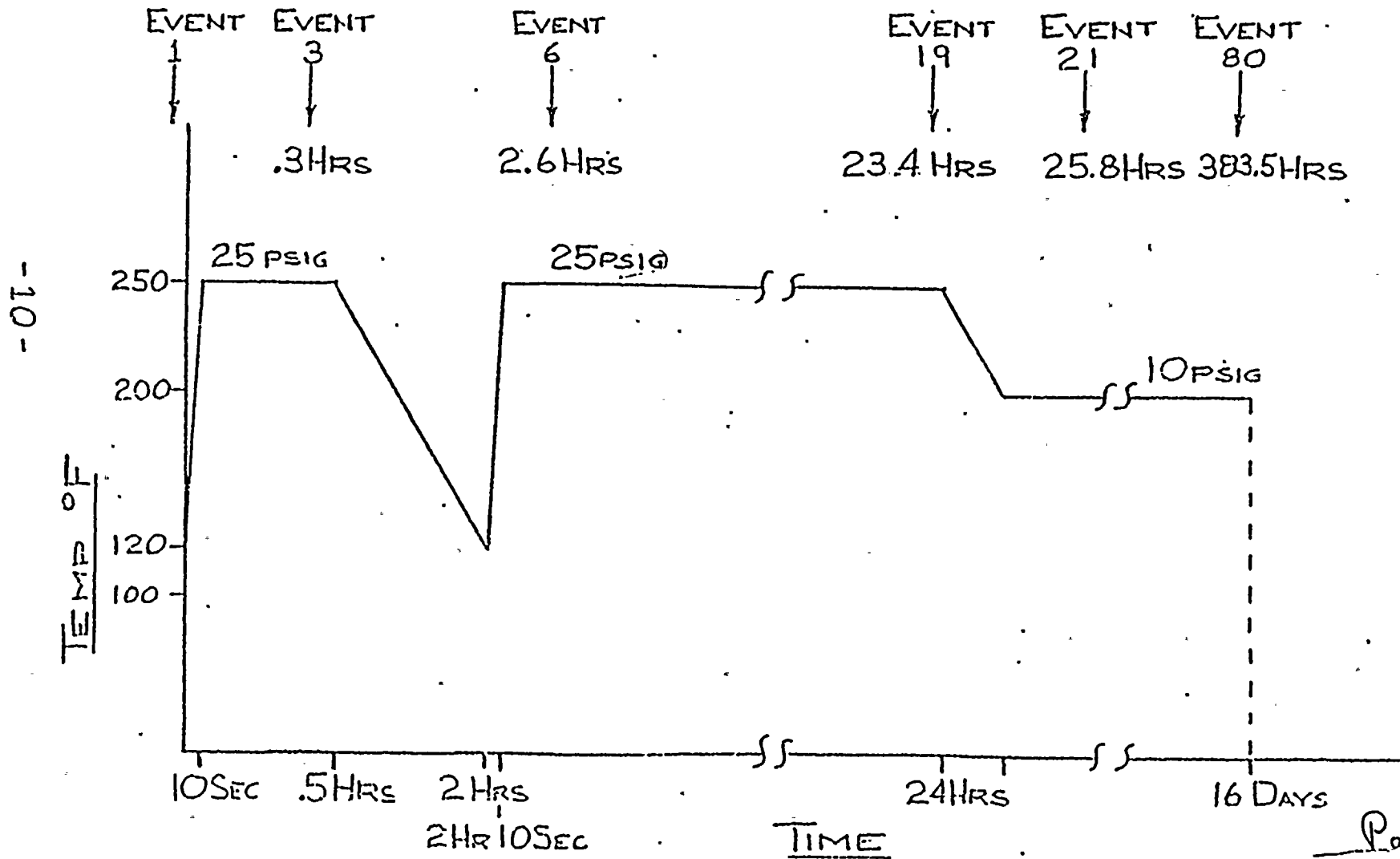


FIGURE 1

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OF EQUIP.
(PAGE)

208-209

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF.*		QUALIFICATION METHOD	OUTSTANDING ITEMS
	PARAMETER	SPEC.	QUAL.	SPEC.	QUAL.		
SYSTEM: Residual Heat Removal	Operating Time	1 day	7 DAYS	Note A below	22	Simul.	None
PLANT ID NO: ICA-305,306	Temperature (°F)	Fig 022.1-1,-2	330	FSAR APP Q	22	Simul.	None
COMPONENT: Valve Motor Operator	Pressure (PSIA)	Fig 2. Fig 1	104.7	APP 6504	22	Simul.	None
MANUFACTURER: Limitorque	Relative Humidity (%)	100	100		22	Simul.	None
MODEL NUMBER: SMB-2	Chemical Spray	NA	2600 ppm 15% water sol. PH 7.67 Acid	INSIDE CT EXTENDING	22	Simul.	None
FUNCTION: Long term post accident cooling	Radiation (10 ⁶ rads)	<4.6	See note B	AEISC NSLL calc. DC-N-6470-2	See note B	See NOTE B below.	None
ACCURACY: SPEC: NA DEMON: NA	Aging (years)						
SERVICE: RHR suction from CT sump	Submergence	NA	NA	NA	NA	NA	NA
LOCATION: Inside Containment Ext.							
FLOOD LEVEL ELEV: 612'							
ABOVE FLOOD LEVEL: yes							

*Documentation References:

22. Limitorque Corp Test Report #600198.

Notes:

A) letters J. Tillinghast (AEP) to K. Knie (NRC) dated 4-14-75 and 9-29-75.

B) These are Westinghouse supplied valves, insulation class H, specified for nuclear service inside CT. Limit switch material for these valves is white melamine (radiation resistant material). We are continuing to seek information.

Page V10-1

REV. 1 9/2/80

Ref 22. Qualified by Linitorque Corp. Test Laboratory.
Project #600198. November 1968

Type of Test: simultaneous, steam
chemical spray
separate seismic test

Type Profile:

328°F, 90 psig for 1 hr
312°F, 70 psig for 2 hrs
287°F, 40 psig for 2 hrs
271°F, 20 psig for 19 hrs
250°F, 15 psig for 6 days

Chemical Spray:

1.5% boric acid buffered with Na OH to a PH of 7.67.

Seismic Test 8/20/79

Horizontal Force, 5.3 G at 35 Hz
Vertical force 5.3 G at 35 Hz
No resonance freq from 5 to 35 Hz



