



**Prediction of External Corrosion
for Steel Cylinders at the Paducah
Gaseous Diffusion Plant: Application of an
Empirical Method**

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MANAGED BY
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
FOR THE UNITED STATES
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1. INTRODUCTION

During the summer of 1995, ultrasonic wall thickness data were collected for 100 steel cylinders containing depleted uranium (DU) hexafluoride located at Paducah Gaseous Diffusion Plant (PGDP) in Paducah, Kentucky. The cylinders were selected for measurement to assess the condition of the more vulnerable portion of the cylinder inventory at PGDP (Blue 1995a). The purpose of this report is to apply the method used in Lyon (1995) to estimate the effects of corrosion for larger unsampled populations as a function of time. The scope of this report is limited and is not intended to represent the final analyses of available data. Future efforts will include continuing analyses of available data to investigate defensible deviations from the conservative assumptions made to date.

For each cylinder population considered, two basic types of analyses were conducted: (1) estimates were made of the number of cylinders as a function of time that will have a minimum wall thickness of either 0 mils (1 mil=0.001 in.) or 250 mils and (2) the current minimum wall thickness distributions across cylinders were estimated for each cylinder population considered. Additional analyses were also performed investigating comparisons of the results for F and G yards with the results presented in Lyon (1995).

2. CORROSION PREDICTION METHODOLOGY

The main assumption is that if $C(t)$ is the distribution of the amount of corrosion (in mils, where 1 mil = 0.001 inch) by a certain age t (yr), then the ratio $C(t)/t$ can be treated as a sample from a distribution R . The random variable R is the age-averaged corrosion rate in mils per year. It is stressed that no other assumptions are made regarding the corrosion for a fixed cylinder. In particular, it is not assumed that the corrosion rate is constant for a fixed cylinder.

The probability that a given amount of corrosion will occur by a given age t is given by

$$\begin{aligned} \text{Probability of } X \text{ mils of corrosion by time } t &= \text{Probability that } R > X/t \\ &= 1 - F_R(X/t) \end{aligned} \tag{1}$$

where $F_R(y)$ is the cumulative distribution function (cdf) for R . An estimate of the number of cylinders that have had X mils of corrosion by age t is then determined by multiplying the probability obtained in Eq. 1 by the number of cylinders of age t . Once the probabilities and associated confidence limits have been estimated, the age distribution of the cylinder population is used to estimate the number of cylinders that have minimum thickness less than a fixed value as a function of time. For example, to determine the number of cylinders that will be breached in 1996, we first estimate how many mils of corrosion must occur. Assuming an initial thickness of Y mils, this is equivalent to estimating the number of cylinders that have had at least Y mils of corrosion by the year 1996. Then the total number of cylinders that are predicted to have at least Y mils of corrosion by the year 1996, denoted here by $T(1996)$, is given by

$$\begin{aligned}
T(1996) &= \{ \text{Probability of at least } Y \text{ mils of corrosion in 1 year} \} * \{ \text{Number of cylinders of age 1 in 1996} \} \\
&\quad + \{ \text{Probability of at least } Y \text{ mils of corrosion in 2 years} \} * \{ \text{Number of cylinders of age 2 in 1996} \} \\
&\quad + \{ \text{Probability of at least } Y \text{ mils of corrosion in 3 years} \} * \{ \text{Number of cylinders of age 3 in 1996} \} \\
&\quad + \dots \\
&= \{ \text{Probability } C(1) > Y \} * \{ \text{Number of cylinders of age 1 in 1996} \} \\
&\quad + \{ \text{Probability } C(2) > Y \} * \{ \text{Number of cylinders of age 2 in 1996} \} \\
&\quad + \{ \text{Probability } C(3) > Y \} * \{ \text{Number of cylinders of age 3 in 1996} \} \\
&\quad + \dots \\
&= \{ \text{Probability } R > Y \} * \{ \text{Number of cylinders of age 1 in 1996} \} \\
&\quad + \{ \text{Probability } R > Y/2 \} * \{ \text{Number of cylinders of age 2 in 1996} \} \\
&\quad + \{ \text{Probability } R > Y/3 \} * \{ \text{Number of cylinders of age 3 in 1996} \} \\
&\quad + \dots
\end{aligned} \tag{2}$$

The method used to calculate the probabilities and confidence limits is that used in Lyon (1995). With this method it is assumed that the distribution R is lognormally distributed, with unknown mean and standard deviation. The computed age-averaged corrosion rates are used as samples from the distribution R (see Eq. 1). The maximum likelihood estimates (MLEs) of the mean and standard deviation are then calculated. The maximum likelihood estimates are the values that, if the distribution is lognormal, maximize the probability of obtaining the data observed. To verify the reasonableness of the assumption that the distribution R is lognormally distributed, goodness-of-fit tests are performed for each cylinder population considered (see Appendix B). Upper 95% confidence limits are also calculated for the probabilities in Eq. 2; these are used to calculate confidence limits on the number of cylinders that have experienced a given amount of corrosion. This confidence limit addresses uncertainty due to the fact that only a subset of the entire population was sampled. In contrast, the results using the MLE estimates are based on the “best” lognormal distribution for the observed data, where the “best” lognormal distribution is the one for which the observed data are most likely.

This methodology does not specifically address an important and recognized aspect of corrosion: that the corrosion rates will usually “level off” after some initial time period (e.g., see Mattsson 1984). Given relatively constant conditions, corrosion rates are usually initially higher and then tend to decrease toward some lower and relatively constant value. Without measurements on the same cylinder at different times, this “leveling off” must be inferred from measurements of cylinders of different ages. It is not within the scope of the current report to explore such behavior. The method used here should be conservative in most cases; no matter at what time the age-averaged corrosion rate is calculated, its use for later times should be an overestimate. The appropriateness and sufficiency of this method depend on the decisions to be made, as well as associated risks and costs.

3. SUMMARY OF DATA

The data used in the analyses are provided in Appendix A. These data are from Swain (1995), Schmidt (1995) and Broders (1995). In general, the cylinders were selected with the objective of assessing the condition of “the more vulnerable portion of the 30,000 cylinder inventory” at PGDP (Blue 1995a). The cylinders were not randomly selected, but were selected based on the judgement of site personnel and/or convenience.

Type of Data Collected

For each cylinder selected for inspection, wall thickness data were collected on a 10-in. wide strip that ran from about the 3 o'clock to the 9 o'clock position on the cylinder, where the 6 o'clock position is at the very bottom of the cylinder. The particular strip selected on each cylinder was chosen based on

the worst visual area of the cylinder. Two types of measurements were made with the equipment used: (1) an estimate of the remaining wall thickness and (2) an estimate of the pit depth. Approximately 100,000 data points were collected for each cylinder, where a data point consisted of the two measurements for a square region of width and height of about 0.1 in.

Estimation of Amount of Corrosion

For the purpose of the present analysis, the quantity of interest is the amount of corrosion that has occurred. This is because it is necessary to predict corrosion on cylinders as a function of time; therefore, an estimate of the current corrosion rate is needed. For the purpose of this analysis, the estimated pit depth is used to estimate the amount of corrosion that has occurred. It is noted that this sometimes may be an underestimate of the actual corrosion that has occurred, the exact degree of which depends on the amount of general corrosion that has occurred on the cylinder wall surface. This approach is different than that used in Lyon (1995), where only the minimum wall thickness was available. This required that assumptions be made about the initial thickness of the measured cylinders to estimate how much corrosion had occurred.

Initial Thickness of Cylinders

Use of the maximum pit depth as an estimate of the amount of corrosion that has occurred reduces the effect of the uncertainty in the initial thickness for the measured cylinders. However, some assumption must still be made when predicting the minimum wall thickness for larger populations of cylinders.

For the purpose of the present analysis, simple bounding analyses were conducted to address the uncertainty in the initial thickness for the unsampled cylinders. In particular, the limits of the design specifications (302.5 mils and 345.5 mils), the nominal design thickness of 312.5 mils, as well as the mean maximum wall thickness of 329 mils for the measured cylinders, were used for the initial thicknesses to bound the results; these results can also assist in determining the sensitivity of the results to the assumed initial thickness.

General Yard Descriptions

C-745-B Yard. This yard contains cylinders manufactured between 1956 and 1988. Only six cylinders were inspected, all type 48T and manufactured in the period 1956–57. These cylinders have been stored on 10-in. high concrete piers above the yard surface since April 1967 (Blue 1995a). Four top row and two bottom row cylinders were measured, this particular choice of cylinders being a matter of convenience for the material handlers (Blue 1995a). Both of the bottom row cylinders had a minimum thickness of less than 250 mils, while the wall thicknesses for the top row cylinders ranged from 280 to 300 mils. Six hundred of this type of cylinders are located in the yard. Due to the extremely small sample size from the top and bottom rows, no analyses of these data are included in this particular report.

C-745-F Yard. C-745-F yard contains approximately 4500 cylinders, which are 14-ton type O and OM cylinders manufactured in the period 1959–1964. Twenty-six (26) cylinders were inspected (13 from both the bottom and top rows).

C-745-G Yard. C-745-G yard contains approximately 7500 cylinders, which are 14-ton type O and OM cylinders that are presently being moved to improve the condition of yard. A total of 26 cylinders were inspected. These cylinders consisted of what were considered to be four populations (Blue 1995a, 1995b): (1) 4 top row cylinders that were set aside to see results for 30-year top row cylinders (11575,

14293, 18660, and 13298); (2) 4 bottom row cylinders that had been measured previously with hand-held instruments (11636, 14666, 16036, 16121); (3) 11 bottom row cylinders from two rows that had been set aside because of suspected bottom corrosion (10375, 10232, 10499, 11954, 13193, 16027, 17660, 17695, 18071, 18592, 18651); and (4) 7 cylinders that had been set aside as part of a 1-in-10 sampling plan program initiated for the current relocation and improvement of G yard (13167, 14418, 16306, 17587, 17640, 17734, 18012).

The possible effect of the condition of the bottom row cylinders in C-745-G yard on the accuracy of the equipment was a concern (Blue 1995c). Material at the bottom of the pits can cause the equipment to underestimate the actual pit depth. Checks with hand-held instruments indicated that the pit depths may be underestimated by about 15 mils (Blue 1995c), and, for this reason, a factor of 15 mils was added to the measured maximum pit depth for these cylinders.

K and L Yard. The C-745-K and C-745-L yards contain about 9000 Type OM and G cylinders manufactured in the period 1958–1992. These cylinders have been stored on 5-in. concrete saddles in gravel yards constructed with an underground drainage system. The sampling was limited to those cylinders manufactured during the period 1976–1982 that had lost large portions of their protective coating (Blue 1995a). A total of 42 cylinders were inspected (39 from K yard, 3 from L yard). Twenty-five cylinders were from the bottom row and 17 were from the top row.

4. DATA ANALYSIS

The results of the data analyses are presented in this section. For more details regarding these analyses, see Appendix B. The parameters of the fitted lognormal distributions for the different cylinder populations are given in Table 1. Using a variant of the standard Kolmogorov-Smirnov goodness-of-fit test, one can accept at the 0.05 level of confidence that the data are from a lognormal distribution for all of the subpopulations shown in Table 1.

Statistical tests were also performed to determine if there were significant differences between the corrosion rates for the different cylinder populations. These populations consist of the different cylinder yards, the row position of a cylinder (top or bottom row), and different subpopulations within G yard.

A statistically significant difference exists between the estimated corrosion rates for the top and bottom row cylinders, with the average corrosion rate for the bottom row cylinders being larger than that of the top row cylinders. This result holds when comparing the top and bottom row cylinders in: F/G/K/L yards, F yard, G yard, and the K/L yard cylinders. For this reason, these two populations are treated separately for all analyses conducted.

Despite the similarity of the yards, one cannot accept the hypothesis that the F and G yard bottom row cylinders have the same median corrosion rate; therefore, these populations are treated separately. This may be due to the fact that 15 of the G yard cylinders had been chosen for inspection based on suspected ground side corrosion (Blue 1995a). However, one can accept that the top row cylinders in these yards have the same median corrosion rate, so these populations are combined. In addition, based on these comparisons, it was considered acceptable to combine the different subsets of G yard cylinders (although top and bottom row cylinders were not combined).

Table 1. Maximum likelihood estimates (MLEs) of lognormal distribution parameters for the average corrosion rate for each yard

Yard	Top Row Cylinders		Bottom Row Cylinders	
	Number of Cylinders	MLE Estimates of Mean and Standard Deviation for Natural Logarithm of Age-Averaged Corrosion Rate	Arithmetic Mean and Standard Deviation	MLE Estimates of Mean and Standard Deviation for Natural Logarithm of Age-Averaged Corrosion Rate
F/G/K/L	39	0.21, 0.36	1.31, 0.48	0.70, 0.45
F/G	22	-0.01, 0.26	1.02, 0.28	0.73, 0.52
F	13	-0.05, 0.31	0.99, 0.34	0.34, 0.46
G	9	0.06, 0.16	1.07, 0.16	1.02, 0.33
K/L	17	0.48, 0.27	1.67, 0.45	0.67, 0.35
				2.21, 0.93
				2.33, 1.09
				1.54, 0.66
				2.93, 0.98
				2.07, 0.68

5. RESULTS

For each cylinder population considered, there were two basic types of analyses conducted:

- (1) estimates were made of the number of cylinders as a function of time that will have a minimum wall thickness of either 0 mils (a breach) or 250 mils and
- (2) the current minimum wall thickness distributions across cylinders were estimated for each cylinder population considered.

Additional analyses were performed investigating comparisons of the results for F and G yards with the results in Lyon (1995). It is stressed that the minimum thickness predicted is for a region with an area of about 0.01 sq. in, because this is the type of data used; this does not imply that the entire cylinder wall is at or below the minimum thickness.

Cylinders with Breaches or Minimum Wall Thickness less than 250 mils

The results of the first analysis are summarized in Tables 2 and 3. Because only one distribution was fit to the age-averaged corrosion rates, the dependence of the results on the initial thickness assumed is more straightforward than that in Lyon (1995): for all cases, the larger the assumed initial thickness, the smaller the number of predicted breaches or cylinders with a minimum thickness below 250 mils. This means that conservative bounds can be estimated from these results. In general, the differences are smaller when considering the predicted number of breaches (the impact of the uncertainty in the initial thickness is discussed in more detail in the Uncertainties and Limitations section).

Using the MLE estimates, few breaches are predicted for the present. The only population for which a breach is predicted is for the bottom row cylinders in G yard. In general, no breaches are predicted in 1996 using either the MLE or upper 95% confidence limits for the top row cylinders in any of the yards considered. This is due to the low observed corrosion rates for this population of cylinders and illustrates the importance of considering the top and bottom row cylinders as separate populations.

Given that none of the K/L yard cylinders inspected had a minimum thickness of less than 250 mils (see Appendix A), the results in Tables 2 and 3 may seem surprising: between 1–11% of the 4390 bottom row cylinders are predicted to currently have a minimum thickness of less than 250 mils. Furthermore, after 1996, more cylinders are predicted to have a minimum thickness less than 250 mils than in F yard bottom row, even though a higher fraction has been observed for F yard (3 of the 13 F yard bottom row cylinders inspected had a minimum thickness less than 250 mils). The reason for this prediction is a combination of higher age-averaged corrosion rates for K/L yard than that for F yard (Table 1) and because the cylinders sampled in K/L yard were delivered in the period 1976–1982, yet the entire population (bottom row) has about 275 delivered during the period 1958–1963. When the calculated corrosion rates are applied to the entire population, these older cylinders account for more than 50% of the cylinders predicted to have a minimum thickness less than 250 mils (see the intermediate results in Appendix C for a detailed breakdown of the numbers in Tables 2 and 3). Similar comments apply to the top row cylinders. In summary, these results may be conservative if the age-averaged corrosion rates for the older cylinders are lower than that for the younger cylinders.

Table 2. Summary results for predicted breaches^A

Yard	N	MLE Predicted Breaches in 1996				Upper 95% CL on Predicted Breaches in 1996			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	0	0	0	0	8	7	6	5
C-745-G yard bottom row cylinders (3622 cylinders)	17	1	1	0	0	30	25	18	14
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	0	0	0	0	0	0	0	0
C-745-F/G yards top row cylinders (5831 cylinders)	22	0	0	0	0	0	0	0	0
C-745-K/L yards top row cylinders (4383 cylinders)	17	0	0	0	0	0	0	0	0
Yard	N	MLE Predicted Breaches in 2000				Upper 95% CL on Predicted Breaches in 2000			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	0	0	0	0	13	11	9	7
C-745-G yard bottom row cylinders (3622 cylinders)	17	3	2	1	1	54	45	34	26
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	0	0	0	0	1	1	0	0
C-745-F/G yards top row cylinders (5831 cylinders)	22	0	0	0	0	0	0	0	0
C-745-K/L yards top row cylinders (4383 cylinders)	17	0	0	0	0	0	0	0	0
Yard	N	MLE Predicted Breaches in 2010				Upper 95% CL on Predicted Breaches in 2010			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	1	1	0	0	31	28	23	19
C-745-G yard bottom row cylinders (3622 cylinders)	17	25	19	12	8	165	142	112	88
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	0	0	0	0	4	3	2	2
C-745-F/G yards top row cylinders (5831 cylinders)	22	0	0	0	0	0	0	0	0
C-745-K/L yards top row cylinders (4383 cylinders)	17	0	0	0	0	0	0	0	0
Yard	N	MLE Predicted Breaches in 2020				Upper 95% CL on Predicted Breaches in 2020			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	3	3	2	1	62	55	47	39
C-745-G yard bottom row cylinders (3622 cylinders)	17	95	76	53	37	367	323	261	212
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	1	1	1	0	17	14	10	7
C-745-F/G yards top row cylinders (5831 cylinders)	22	0	0	0	0	0	0	0	0
C-745-K/L yards top row cylinders (4383 cylinders)	17	0	0	0	0	1	1	0	0

^A The initial thickness design specifications range from 302.5 to 345.5 mils, with a nominal thickness of 312.5 mils. The average of the maximum wall thicknesses on the same part length where the maximum pits occurred was 329 mils.

Table 3. Summary results for predicted cylinders with minimum thickness less than 250 mils^A

Yard	N	MLE Predicted Cylinders with Thickness below 250.0 mils in 1996				Upper 95% CL on Predicted Cylinders with Thickness below 250.0 mils in 1996			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	587	392	197	98	916	702	458	307
C-745-G yard bottom row cylinders (3622 cylinders)	17	3113	2747	2083	1452	3329	3065	2537	1954
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	607	341	146	67	960	607	296	152
C-745-F/G yards top row cylinders (5831 cylinders)	22	261	61	5	0	626	253	55	12
C-745-K/L yards top row cylinders (4383 cylinders)	17	239	127	41	11	457	251	100	42
Yard	N	MLE Predicted Cylinders with Thickness below 250.0 mils in 2000				Upper 95% CL on Predicted Cylinders with Thickness below 250.0 mils in 2000			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	753	525	282	150	1104	867	585	402
C-745-G yard bottom row cylinders (3622 cylinders)	17	3353	3076	2488	1861	3499	3318	2889	2359
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	1090	638	270	122	1544	1026	527	278
C-745-F/G yards top row cylinders (5831 cylinders)	22	521	153	16	2	999	450	114	28
C-745-K/L yards top row cylinders (4383 cylinders)	17	450	220	75	24	834	464	184	78
Yard	N	MLE Predicted Cylinders with Thickness below 250.0 mils in 2010				Upper 95% CL on Predicted Cylinders with Thickness below 250.0 mils in 2010			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	1186	906	559	336	1535	1282	933	680
C-745-G yard bottom row cylinders (3622 cylinders)	17	3579	3492	3198	2744	3613	3582	3422	3112
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	2621	1884	998	502	3102	2412	1496	903
C-745-F/G yards top row cylinders (5831 cylinders)	22	1582	699	138	23	2258	1260	435	143
C-745-K/L yards top row cylinders (4383 cylinders)	17	1747	962	329	115	2357	1540	721	332
Yard	N	MLE Predicted Cylinders with Thickness below 250.0 mils in 2020				Upper 95% CL on Predicted Cylinders with Thickness below 250.0 mils in 2020			
		Initial Thickness (mils)				Initial Thickness (mils)			
		302.5	312.5	329	345.5	302.5	312.5	329	345.5
C-745-F yard bottom row cylinders (2229 cylinders)	13	1562	1285	887	589	1853	1633	1278	982
C-745-G yard bottom row cylinders (3622 cylinders)	17	3616	3596	3493	3262	3622	3618	3586	3472
C-745-K/L yards bottom row cylinders (4390 cylinders)	25	3713	3139	2130	1314	4015	3570	2670	1862
C-745-F/G yards top row cylinders (5831 cylinders)	22	2943	1702	526	130	3652	2427	1065	431
C-745-K/L yards top row cylinders (4383 cylinders)	17	3263	2363	1128	466	3721	2972	1766	968

^A The initial thickness design specifications range from 302.5 to 345.5 mils, with a nominal thickness of 312.5 mils. The average of the maximum wall thicknesses on the same part length where the maximum pits occurred was 329 mils.

Distributions of Minimum Wall Thicknesses Across Cylinders

Using the method described in Sect. 2, it is possible to construct an estimate of the minimum wall thickness distribution for any subpopulation. These results are summarized in Table 4. Only the estimates based on the MLE values are given because it is difficult to obtain exact upper 95% confidence limits on each minimum thickness range, as this is equivalent to obtaining confidence limits on the difference $F(b)-F(a)$, where $F(x)$ is the cumulative distribution function of a lognormal distribution.

It is noted that none of the cylinders inspected had an estimated minimum wall thickness below 178 mils. It is known that the cylinders were selected for measurement based on the concern that they were members of vulnerable subpopulations (Blue 1995a); therefore, it may be that they actually represent the worst-case cylinders. However, the method used here conservatively assumes that they have been randomly sampled from their respective subpopulations. The effect of this assumption is that it may be relatively likely (given the total number of cylinders) that there are cylinders predicted to have experienced corrosion rates higher than those cylinders sampled. Without sampling every cylinder, it is not possible to rule out unobserved events (e.g., a breached cylinder). The method used here extrapolates the observed distribution of the corrosion rates to the unsampled cylinders.

Comparison with Previous Results for C-745-F and G yards

A similar analysis was performed using different set of data for F and G yards in Lyon (1995). The data used in that analysis consisted of minimum wall thickness data measured at the bottom of corrosion pits with a 2 mm diameter ultrasonic probe. These cylinders had been selected for measurement due to the presence of loose scale corrosion products. In Table 5, the mean corrosion rates are compared with the data used in this analysis. In all cases, the difference in medians is statistically significant at the 0.05 level of confidence (see Appendix B), and for this reason, the previously collected data were not combined with more recently gathered data. There may be ways to properly combine these two data sets, but this will require a more detailed analysis that is beyond the scope of this report.

The results are similar for predicted breaches in 1996, although the upper 95% confidence limits for the G yard cylinders are considerably lower in the present analysis (data were available for only eight cylinders in G yard in Lyon 1995, compared to 17 in the present analysis for the bottom row G yard cylinders). At 2020, there is a larger difference due to the difference in the age-averaged corrosion rates.

The differences for F yard in 1996 should be discussed because they are, at first glance, counterintuitive (i.e., the mean of the previously used data set was 4.23 mils/yr, while the mean of the bottom row cylinders in the present analysis is 1.54 mils/yr, and yet the upper 95% confidence limit is higher using the distribution with the smaller mean). In fact, inspection of the intermediate results shows that the probabilities calculated using the fitted distributions are higher in 1996 than those calculated for the present analysis. Further, the arithmetic standard deviations of the two data sets are identical at 0.66 mils/yr. It is not due to the smaller sample size alone that the upper 95% confidence limits are larger in the present analysis, because when using 21 instead of 13 for the sample size, the calculated upper 95% confidence limit is still larger at about 3 cylinders. The reason for the difference is the difference in the *ratios* of the mean and standard deviation of the two data sets (i.e., the coefficient of variation of the more recent data set is larger than that of the previously used data set).

Table 4. Summary of predicted minimum wall thickness distributions in 1996^A

	N	MLE Predicted Minimum Wall Thickness Distribution in 1996																			
		Minimum thickness < 62.5 mils			Minimum thickness 62.5 to 187 mils			Minimum thickness 188 to 250 mils			Minimum thickness 250 to 280 mils			Minimum thickness > 280 mils							
		Initial Thickness (mils)	302.5	312.5	329	345.5	Initial Thickness (mils)	302.5	312.5	329	345.5	Initial Thickness (mils)	302.5	312.5	329	345.5	Initial Thickness (mils)	302.5	312.5	329	345.5
C-745-F yard Bottom row cylinders (2229 cylinders)	13	0	0	0	0	42	28	15	8	544	364	182	90	1048	826	476	248	594	1011	1556	1883
C-745-G yard Bottom row cylinders (3622 cylinders)	17	11	8	4	2	839	622	367	209	2263	2117	1712	1240	504	822	1142	1177	5	53	397	993
C-745-K/L yards Bottom row cylinders (4390 cylinders)	25	0	0	0	0	26	16	8	4	580	324	138	63	2514	1657	604	223	1269	2392	3640	4100
C-745-F/G yards Top row cylinders (5831 cylinders)	22	0	0	0	0	0	0	0	0	261	61	5	0	3831	2301	412	39	1739	3469	5414	5792
C-745-K/L yards Top row cylinders (4383 cylinders)	17	0	0	0	0	2	1	0	0	237	127	41	11	2457	1125	261	94	1688	3131	4080	4278

^A The initial thickness design specifications range from 302.5 to 345.5 mils, with a nominal thickness of 312.5 mils. The average of the maximum wall thicknesses over all cylinders measured was 329 mils.

Table 5. Comparison of mean and standard deviation of age-averaged corrosion rates (mils/yr) for C-745-F and C-745-G yards calculated in Lyon (1995) and those calculated in present analysis

Yard	Values in Lyon (1995)			Present Analysis	
	N	Initial thickness 312.5 mils*	Initial thickness 345.5 mils*	N	Population
C-745-F Yard	21	3.25,0.66	4.23,0.68	13	Top row 0.99,0.34
				13	Bottom row 1.54,0.66
C-745-G Yard	8	3.41,0.82	4.38,0.79	9	Top row 1.07,0.16
				17	Bottom row 2.93,0.98

* Information was not available to allow an estimate of the initial thickness for each cylinder, and so a separate analysis was conducted using fitted distributions from each initial thickness.

The predicted number of breaches for the yards are compared in Table 6.

Table 6. Comparison of predicted number of breaches for C-745-F and C-745-G yards using corrosion rate distributions in Lyon (1995) and those calculated in present analysis

	Predicted Number of Breaches in 1996*						
	Values using distributions from Lyon (1995) ^A			This Analysis ^B			
	N	MLE	Upper 95%		N	MLE	Upper 95%
C-745-F Yard	21	0	0		13	0	7
C-745-G Yard	8	0	110		17	1	25
	Predicted Number of Breaches in 2020*						
	N	MLE	Upper 95%		N	MLE	Upper 95%
C-745-F Yard	21	17	103		13	3	55
C-745-G Yard	8	186	1213		17	76	322

* Based on an assumed initial thickness of 312.5 mils.

^A A more detailed age distribution is used here rather than the one used in Lyon(1995).

^B Bottom row cylinders only.

This can be illustrated with some example calculations. If a cylinder was delivered in 1958, and one wants to estimate the probability that a breach will occur in 1996, then, assuming an initial thickness of 312.5 mils, one estimates the probability of an age-averaged corrosion rate of

$$312.5 \text{ mils}/(1996-1958)=8.22 \text{ mils/yr.}$$

Therefore, the desired probability is

$$Prob\{R>8.22\} = Prob\{\ln R>2.11\}$$

$$= Prob\left\{\frac{\ln R - \mu_L}{\sigma_L} > \frac{2.11 - \mu_L}{\sigma_L}\right\}$$

where μ_L and σ_L are the mean and standard deviation of the natural logarithm of R . Because R is lognormally distributed, $\ln R$ is normally distributed, and $(\ln R - \mu_L)/\sigma_L$ is normally distributed with mean 0 and standard deviation 1 (i.e., it is a standard normal random variable). Therefore, the probability that a breach occurs for this cylinder is equivalent to the probability that a standard normal variable exceeds the value $(2.11 - \mu_L)/\sigma_L$. Using the maximum likelihood estimates of μ_L and σ_L for the two data sets, these probabilities can be compared. The intermediate calculations are shown in Table 7. In this case, the calculated probability using the data set from Lyon (1995) is about 60 times lower than that using the more recent data, despite the large mean age-averaged corrosion rate of the former data set.

Table 7. Intermediate calculations illustrating reason for differences between results in Lyon (1995) for F yard and present analysis: comparison of probability of a breach in 1996 for a cylinder delivered in 1958. Probability computed is the probability of an age-averaged corrosion rate of 8.22 mils/yr

	Mean and standard deviation of corrosion rates	MLE Estimate of Mean (μ_L) and standard deviation (σ_L) of natural logarithm of corrosion rates	$(\ln(8.22) - \mu_L)/\sigma_L$	Probability of a breach: probability that a standard normal random variable exceeds $(\ln(8.22) - \mu_L)/\sigma_L$
F yard data in Lyon (1995)	3.25, 0.66	1.16, 0.20	4.73	1×10^{-6}
F yard data in present analysis (bottom row cylinders)	1.54, 0.66	0.34, 0.46	3.84	6×10^{-5}

In general, whether or not the probability is larger using the more recent data set depends on the age-averaged corrosion rate of interest. For example, to calculate the probability that a cylinder delivered in 1958 has a minimum thickness of 250 mils or less in 1996 is equivalent to calculating the probability of an age-average corrosion rate of at least

$$(312.5 - 250) \text{ mils} / (1996 - 1958) = 1.64 \text{ mils/yr.}$$

The same intermediate calculations as used before are shown in Table 8. In this case, the probability is about twice as large using the data in Lyon (1995) compared to the more recent data, and the difference is the corrosion rate of interest: the distribution parameters are identical to the previous analysis comparing breaches.

6. UNCERTAINTIES AND LIMITATIONS

The purpose of this report is to estimate the extent of corrosion on populations of cylinders as a function of time, and this requires that assumptions be made regarding the dependence of the distribution of corrosion rates on time. The data currently available consist of wall thickness measurements made on different cylinders of different ages. No data are available for the same cylinder at substantially different times. This makes using more realistic and less conservative models difficult, and one is forced to either make conservative assumptions regarding the change of corrosion with time or to use measurements from different cylinders at different ages to estimate corrosion with time. The latter introduces more uncertainty because it may be expected that there will be variability in the amount of corrosion across

Table 8. Intermediate calculations illustrating reason for differences between results in Lyon (1995) for F yard and present analysis: comparison of probability of cylinder having a minimum thickness of 250 mils or less in 1996 for a cylinder delivered in 1958. Probability computed is the probability of an age-averaged corrosion rate of 1.64 mils/yr

	Mean and standard deviation of corrosion rates	Mean (μ_r) and standard deviation (σ_r) of natural logarithm of corrosion rates	$(\ln(1.64) - \mu_r)/\sigma_r$	Probability that minimum thickness < 250 mils in 1995: probability that a standard normal random variable exceeds $(\ln(1.64) - \mu_r)/\sigma_r$
F yard data in Lyon (1995)	3.25, 0.66	1.16, 0.20	-3.3	0.99
F yard data in present analysis (bottom row cylinders)	1.54, 0.66	0.34, 0.46	0.35	0.36

cylinders (due, for example, to differences in the handling and storage history), and this variability may complicate the determination of important attributes of the temporal aspect of corrosion. In the present analysis, it is assumed that the distribution of age-averaged corrosion rates is approximately independent of time. Under this assumption, the data collected are approximately lognormally distributed. This assumption may be conservative if the distribution of corrosion rates decreases with time, which is suggested when comparing the data collected for K/L yard and F yard, as the younger K/L yard cylinders have a higher age-averaged corrosion rate than that for the older F yard cylinders.

The results are also based on the assumption that the data are representative of the population from which they are taken, and this assumption is difficult to assess for the collected data. In general, the cylinders selected for measurement were chosen based on whether or not they were in "vulnerable populations" (Blue 1995a), although they were not randomly selected from these populations. In the present analysis, there are two main cases in which this is most suspect. One such case is the set of data for K/L yard. These data are for cylinders delivered in the period 1976–1982, yet there are about 500 cylinders, delivered between 1958 and 1963, on this yard. This older (unsampled) population is predicted to account for most of the cylinders with minimum thickness less than 250 mils in 1996. The second case is for the G yard bottom row cylinders, where 15 of the 17 cylinders inspected had been set aside because of suspected ground side corrosion, and 11 of these cylinders were from two rows. This means that this sample may be from the upper end of the distribution of corrosion rates. For both of the cases noted here, it seems that use of the populations available is conservative in the estimation of the mean corrosion rate, but it is difficult to determine the effect on the estimated variability, which influences the probabilities of rare events such as breaches.

The uncertainty in the initial thickness affects the analysis in two different ways. The first is in estimating the amount of corrosion that has occurred for the sampled cylinders. The second is when predictions are made for the unsampled population. The effect of the uncertainty in the latter aspect is straightforward: assuming a smaller initial thickness for the unsampled population results in smaller estimated wall thicknesses, so simple bounding analyses can be used to bound the results. However, the effect on the results in the former aspect is not necessarily as straightforward because the uncertainty in the initial thickness results in uncertainty in how much corrosion has occurred, which can obscure potentially important patterns in the data, as well as affect the estimated variability of corrosion.

The sensitivity of the results to the initial thickness assumed is more pronounced for estimating the number of cylinders with a minimum thickness below 250 mils than for estimating rarer events such as

breaches. Given that the design specifications for the initial thickness range from 302.5 mils to 345.5 mils, all that is known about the initial thickness is that it is in this range. An uncertainty of more than 40 mils in the initial thickness may be substantial when one considers how long it may take for 40 mils of corrosion to occur. Even at a relatively high corrosion rate of 4 mils per year, this implies a 10-year window of uncertainty.

Variability will exist in the initial thickness even for a fixed cylinder. Given an estimate of the amount of corrosion that occurs by a fixed time, there may be a 40 mil range in the initial thickness for the cylinder. For this reason, it is necessary to know the *distribution* of the initial thickness for the cylinder, with which the probability distribution for the minimum thickness can be estimated. The data currently available should allow preliminary analyses of these distributions. However, further sampling of cylinders may be necessary to more completely characterize these distributions.

A further complicating factor in this analysis is that it is not clear that the age of the cylinder is relevant to the corrosion that has occurred (in Blue 1995a it is noted that "the age of the cylinder appears to be a second order effect"). It may be that for some subpopulations most of the corrosion occurred due to particular storage conditions, and this corrosion is independent of age. In effect, the relevant "age" is the time since these storage conditions were begun, or the length of time a particular cylinder was in a certain environment (e.g., in ground contact). This is particularly important when interpreting results based on the data if the conditions that resulted in the observed accelerated corrosion have been eliminated. For example, there are at present no cylinders in ground contact, yet the data available include periods when the cylinders were in ground contact. This potentially enhances the conservatism of the results, especially for long-term estimates.

Because the top and bottom row cylinders were considered separately, it was necessary to estimate the age distributions of these different populations. It was assumed that for each set of cylinders delivered in a given year for a given yard, half are currently in the top and bottom rows. If an odd number of cylinders were delivered, then the extra cylinder was assumed to be in the bottom row. If the actual age distributions of the cylinders are quite different, then the results could be significantly different due to the differences between the corrosion rates for the top and bottom row cylinders.

There is some measurement uncertainty in the estimated maximum pit depth. The equipment used was set so that the pit depth was determined with a precision (not accuracy) of 3 mils. In some cases, the accuracy may be affected by the condition of the cylinder wall surface. For one of the populations considered, a factor of 15 mils was added to the estimated pit depth due to the condition of the cylinders (C-745-G yard bottom row cylinders).

7. CONCLUSIONS AND RECOMMENDATIONS

During the summer of 1995, wall thickness data were collected for 100 steel cylinders located at PGDP in Paducah, Kentucky. These data were analyzed to estimate the corrosion of the entire cylinder populations as a function of time. The method used consisted of fitting lognormal distributions to the age-averaged corrosion rates as described in Lyon (1995).

Statistically significant differences were noticed between the calculated age-averaged corrosion rates for the top and bottom row cylinders. Further, the age-averaged corrosion rates seem to be lower for the bottom row cylinders in F yard, compared to the G yard and K/L yard cylinders. The difference with the G yard cylinders can be explained by the fact that most (15 out of 17) of the G yard cylinders inspected were selected because of suspected ground side corrosion. However, the K/L yard bottom row cylinders

are stored in what may be considered better conditions: on 5-in. concrete saddles in a drained yard, and settling of the saddles is limited to a fraction of an inch. Because the F yard cylinders inspected are at least 12 years older than those in the K/L yard, it may be that the corrosion rates for the F yard cylinders have slowed, while this has not occurred yet for the K/L yard cylinders. As a result, the age-averaged corrosion rates for F yards would be lower than that for K/L yard.

With the method used, few breaches are predicted at the present. Using the MLE estimates, the only population for which a breach is predicted is for the bottom row cylinders in G yard. In general, no breaches are predicted in 1996 for the top row cylinders in any of the yards considered using either the MLE or upper 95% confidence limits; this is due to the low observed corrosion rates for this population of cylinders and illustrates the importance of considering the top and bottom row cylinders as separate populations.

Comparison of the results for F and G yards with a previous analysis using the same method but with different data (Lyon 1995) indicates that the results are similar for predicted breaches in 1996, but at 2020 there are fewer breaches predicted in the present analysis.

Recommendations

1. It is critical that a random sampling plan be developed and used when data are collected in the future. To date, cylinders have been selected for measurement primarily based on either convenience due to the equipment used or because they were suspected to be "worst-case" cylinders. Use of a random sampling plan is arguably the only manner in which statistically defensible inferences can be made regarding unsampled cylinders. This sampling plan should also include periodic measurements on the same cylinders to provide insight into the dependence of corrosion on time.
2. The impacts of the uncertainty in the initial thickness on the results suggest that it may be worthwhile to address the initial thickness of the cylinders in a more sophisticated fashion. In particular, the distribution of distributions of the initial thickness could be used. This requires estimation of these distributions. The data currently available will allow preliminary investigations in this regard, but additional sampling may be necessary.
3. It is recommended that more detailed analyses be performed investigating the dependence of the distribution of corrosion rates on time. These analyses may require additional sampling of cylinders. The data currently available consist of measurements made on different cylinders of different ages. No data from the same cylinder at substantially different times are available. Due to the considerable variability across cylinders in the factors affecting corrosion (e.g., storage history), this makes defensibly using more realistic and less conservative models difficult.

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APPENDIX A: DATA USED IN ANALYSIS

The wall thickness data used in the analysis are shown in Table A.1. These data are from Swain (1995), Schmidt (1995), Blue (1995), and Broders (1995). The age distributions used are shown in Table A.2. The age distribution data for all cylinders in each yard are from the UF₆ Cylinder Location, Inspection and Measurement (UCLIM) database. The values used for the top and bottom rows are based on the assumption that an equal number are in each row (if there are an odd number of cylinders, then the extra cylinder is assumed to be in the bottom row).

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Schmidt, M. 1995. Personal communication with B. F. Lyon, September.

Swain, W. E. 1995. *UF₆ Cylinder Inspection Report, Automated Ultrasonic Thickness*. Swain Distribution, Inc., September 14, 1995.

Table A.1. Wall thickness data used in analysis

Cylinder	Yard	Row	Delivery Date	Age in 1995 (yr)	Estimated Minimum Wall Thickness (mils)	Maximum Wall Thickness on Part Length where Maximum Pit Occurred (mils)	Maximum Pit Depth (mils)	Average Corrosion Rate (mils/yr)	Ln of Average Corrosion Rate
11344	F	B	1959	36	290	333	43	1.19	0.18
12281	F	B	1959	36	250	330	80	2.22	0.80
13329	F	B	1960	35	245	315	70	2.00	0.69
14806	F	B	1961	34	245	328	83	2.44	0.89
16008	F	B	1961	34	243	333	90	2.65	0.97
16437	F	B	1961	34	285	343	58	1.71	0.53
16635	F	B	1962	33	307	335	28	0.85	-0.16
16744	F	B	1962	33	310	333	23	0.70	-0.36
16750	F	B	1962	33	263	318	55	1.67	0.51
18203	F	B	1962	33	265	323	58	1.76	0.56
100553	F	B	1963	32	305	328	23	0.72	-0.33
101091	F	B	1963	32	282	320	38	1.19	0.17
101755	F	B	1963	32	298	328	30	0.94	-0.06
Average								1.54	0.34
St. Dev.								0.66	0.46
10893	F	T	1959	36	285	330	45	1.25	0.22
11248	F	T	1959	36	290	325	35	0.97	-0.03
11415	F	T	1959	36	260	330	70	1.94	0.66
11884	F	T	1959	36	305	343	38	1.06	0.05
14419	F	T	1961	34	280	318	38	1.12	0.11
16413	F	T	1961	34	312	340	28	0.82	-0.19
16693	F	T	1962	33	287	320	33	1.00	0.00
16741	F	T	1962	33	314	344	30	0.91	-0.10
16747	F	T	1962	33	295	313	18	0.55	-0.61
16896	F	T	1962	33	297	320	23	0.70	-0.36
17434	F	T	1962	33	315	348	33	1.00	0.00
17871	F	T	1962	33	300	323	23	0.70	-0.36
102192	F	T	1964	31	300	328	28	0.90	-0.10
Average								0.99	-0.05
St. Dev.								0.34	0.31
10232	G	B	1959	36	235	325	105	2.92	1.07
10375	G	B	1959	36	202	335	148	4.11	1.41
10499	G	B	1959	36	178	323	160	4.44	1.49
11636	G	B	1959	36	215	318	118	3.28	1.19
11954	G	B	1959	36	243	313	85	2.36	0.86
13193	G	B	1960	35	245	328	98	2.80	1.03
14666	G	B	1961	34	212	320	123	3.62	1.29
16027	G	B	1961	34	203	338	150	4.41	1.48
16036	G	B	1961	34	193	333	155	4.56	1.52
16121	G	B	1961	34	248	318	85	2.50	0.92
17660	G	B	1962	33	282	325	58	1.76	0.56
17695	G	B	1962	33	290	330	55	1.67	0.51
17734	G	B	1962	33	273	323	65	1.97	0.68
18012	G	B	1962	33	260	320	75	2.27	0.82
18071	G	B	1962	33	288	338	65	1.97	0.68
18592	G	B	1962	33	260	338	93	2.82	1.04
18651	G	B	1962	33	260	320	75	2.27	0.82
Average								2.93	1.02

Table A.1. (continued)

Cylinder	Yard	Row	Delivery Date	Age in 1995 (yr)	Estimated Minimum Wall Thickness (mils)	Maximum Wall Thickness on Part Length where Maximum Pit Occurred (mils)	Maximum Pit Depth (mils)	Average Corrosion Rate (mils/yr)	Ln of Average Corrosion Rate
St. Dev.								0.98	0.33
11575	G	T	1959	36	280	320	40	1.11	0.11
13167	G	T	1960	35	272	307	35	1.00	0.00
13298	G	T	1960	35	282	330	48	1.37	0.32
14293	G	T	1960	35	287	325	38	1.09	0.08
14418	G	T	1961	34	290	328	38	1.12	0.11
163 06	G	T	1961	34	287	320	33	0.97	-0.03
17587	G	T	1962	33	288	323	35	1.06	0.06
17640	G	T	1962	33	300	325	25	0.76	-0.28
18660	G	T	1962	33	286	324	38	1.15	0.14
Average								1.07	0.06
St. Dev.								0.16	0.16
117264	K	B	1976	19	307	325	18	0.95	-0.05
117568	K	B	1977	18	293	338	45	2.50	0.92
117985	K	B	1977	18	298	323	25	1.39	0.33
118137	K	B	1977	18	285	340	55	3.06	1.12
118966	K	B	1977	18	287	325	38	2.11	0.75
119324	K	B	1977	18	310	338	28	1.56	0.44
119621	K	B	1977	18	305	323	18	1.00	0.00
119722	K	B	1977	18	305	335	30	1.67	0.51
120016	K	B	1977	18	303	333	30	1.67	0.51
120125	K	B	1977	18	300	323	23	1.28	0.25
120526	K	B	1977	18	307	340	33	1.83	0.61
121648	K	B	1977	18	262	310	48	2.67	0.98
123055	K	B	1978	17	298	323	25	1.47	0.39
123115	K	B	1978	17	307	330	23	1.35	0.30
123461	K	B	1978	17	297	330	33	1.94	0.66
124326	K	B	1978	17	280	325	45	2.65	0.97
124340	K	B	1978	17	308	348	40	2.35	0.86
124886	K	B	1978	17	272	320	48	2.82	1.04
124985	K	B	1980	15	282	330	48	3.20	1.16
125222	K	B	1980	15	278	323	45	3.00	1.10
125249	K	B	1980	15	293	338	45	3.00	1.10
125251	K	B	1980	15	300	333	33	2.20	0.79
125373	K	B	1980	15	310	333	23	1.53	0.43
126773	L	B	1981	14	298	333	35	2.50	0.92
126988	L	B	1981	14	310	338	28	2.00	0.69
Average								2.07	0.67
St. Dev.								0.68	0.35
119433	K	T	1977	18	323	338	15	0.83	-0.18
119778	K	T	1977	18	315	340	25	1.39	0.33
120306	K	T	1977	18	315	348	33	1.83	0.61
120511	K	T	1977	18	308	338	30	1.67	0.51
120521	K	T	1977	18	303	333	30	1.67	0.51
121145	K	T	1977	18	300	325	25	1.39	0.33
121658	K	T	1977	18	300	328	28	1.56	0.44
122084	K	T	1978	17	295	328	33	1.94	0.66
123106	K	T	1978	17	308	333	25	1.47	0.39
123467	K	T	1978	17	272	310	38	2.24	0.80
123471	K	T	1978	17	295	328	33	1.94	0.66

Cylinder	Yard	Row	Delivery Date	Age in 1995 (yr)	Estimated Minimum Wall Thickness (mils)	Maximum Wall Thickness on Part Length where Maximum Pit Occurred (mils)	Maximum Pit Depth (mils)	Average Corrosion Rate (mils/yr)	Ln of Average Corrosion Rate
125002	K	T	1980	15	297	325	28	1.87	0.62
125027	K	T	1980	15	287	330	43	2.87	1.05
125362	K	T	1980	15	315	333	18	1.20	0.18
125376	K	T	1980	15	310	335	25	1.67	0.51
125386	K	T	1980	15	315	338	23	1.53	0.43
129374	L	T	1982	13	305	323	18	1.38	0.33
							Average	1.67	0.48
							St. Dev.	0.45	0.27

Table A.2. Cylinder age distributions used in analysis*

Delivery Year	C-745-F/G/K/L Yards			C-745-F/G Yards			C-745-F yard			C-745-G Yard			C-745-K/L Yards		
	All	Bottom	Top	All	Bottom	Top	All	Bottom	Top	All	Bottom	Top	All	Bottom	Top
1958	1994	998	996	1755	878	877	589	295	294	1166	583	583	239	120	119
1959	1474	738	736	1372	687	685	267	134	133	1105	553	552	102	51	51
1960	1783	892	891	1645	823	822	540	270	270	1105	553	552	138	69	69
1961	1390	696	694	1367	684	683	483	242	241	884	442	442	23	12	11
1962	811	407	404	770	386	384	261	131	130	509	255	254	41	21	20
1963	58	30	28	56	29	27	37	19	18	19	10	9	2	1	1
1964	0	0	0	0	0	0									
1965	0	0	0	0	0	0									
1966	0	0	0	0	0	0									
1967	0	0	0	0	0	0									
1968	204	103	101	183	92	91	93	47	46	90	45	45	21	11	10
1969	0	0	0	0	0	0									
1970	0	0	0	0	0	0									
1971	87	44	43	83	42	41	32	16	16	51	26	25	4	2	2
1972	0	0	0	0	0	0									
1973	800	401	399	800	401	399	121	61	60	679	340	339			
1974	369	185	184	347	174	173	2	1	1	345	173	172	22	11	11
1975	0	0	0	0	0	0									
1976	2909	1455	1454	1640	820	820	642	321	321	998	499	499	1269	635	634
1977	2552	1277	1275	634	318	316	355	178	177	279	140	139	1918	959	959
1978	0	0	0	0	0	0									
1979	609	305	304	103	52	51	103	52	51				506	253	253
1980	1617	809	808	209	105	104	209	105	104				1408	704	704
1981	372	187	185	301	151	150	301	151	150				71	36	35
1982	868	434	434	0	0	0							868	434	434
1983	0	0	0	0	0	0									
1984	41	21	20	0	0	0							41	21	20
1985	0	0	0	0	0	0									
1986	374	187	187	0	0	0							374	187	187
1987	704	352	352	0	0	0							704	352	352
1988	556	278	278	0	0	0							556	278	278
1989	0	0	0	0	0	0									
1990	421	211	210	417	209	208	411	206	205	6	3	3	4	2	2

Table A.2. (continued)

Delivery Year	C-745-F/G/K/L Yards			C-745-F/G Yards			C-745-F yard			C-745-G Yard			C-745-K/L Yards		
	All	Bottom	Top	All	Bottom	Top	All	Bottom	Top	All	Bottom	Top	All	Bottom	Top
1991	0	0	0	0	0	0									
1992	462	231	231	0	0	0							462	231	231
Total	19993	10010	9983		5851	5831	4446	2229	2217	7236	3622	3614	8311	4159	4152

* The values used for the top and bottom rows are based on the assumption that an equal number are in each row (if there are an odd number of cylinders, then the extra cylinder is assumed to be in the bottom row).

Table A.3. Summary statistics for estimated maximum wall thickness

Yard	Row	N	Mean	StDev
F/G/K/L	Bottom and top	94	328.6	8.7
	Bottom	55	328.5	8.1
	Top	39	329.6	9.6
F/G	Bottom and top	52	326.8	8.7
	Bottom	30	327.1	7.8
	Top	22	326.5	10.0
F	Bottom and top	26	328.8	9.4
	Bottom	13	328.2	7.7
	Top	13	329.4	11.2
G	Bottom and top	26	324.9	7.6
	Bottom	17	326.2	7.9
	Top	9	322.4	6.7
K/L	Bottom and top	42	330.7	8.3
	Bottom	25	330.3	8.3
	Top	17	331.4	8.5

APPENDIX B: STATISTICAL TESTS

Two basic types of statistical tests performed. The first consisted of characterizing the goodness-of-fit of the lognormal distributions to the data. The second type consisted of determining if there were statistically significant differences between different cylinder populations.

Goodness-of-Fit Tests

The test used to determine if it was reasonable to assume that the distribution of average corrosion rates were lognormally distributed was a variant of the Kolmogorov-Smirnov test. This test uses the difference between the empirical (or sample) cumulative distribution function and that of the hypothesized distribution. If the difference is too large, then one rejects the hypothesis that the sample came from the hypothesized distribution.

The empirical cumulative distribution function evaluated at a given value r is simply the fraction of the samples with value less than or equal to r . In particular, given N samples $r_1, r_2, \dots, r_N$ from a distribution R , the empirical cumulative distribution function $F_N(r)$ is defined by

$$F_N(r) = \frac{\# \text{ samples } \leq r}{N} \quad (\text{B-1})$$

Let $F(r)$ denote the cumulative distribution of the hypothesized distribution. The Kolmogorov-Smirnov test statistic D_N is defined by

$$D_N = \max_r |F_N(r) - F(r)| \quad (\text{B-2})$$

If the cdf $F(r)$ is continuous, then this statistic is independent of the hypothesized distribution. A closed form has been derived for the distribution of this statistic (e.g., see Vincze 1970), and so the calculated value D_N can be compared to critical values of its distribution to perform hypothesis tests at a prescribed significant level [i.e., one can test the null hypothesis that R has a specified distribution with cumulative distribution function $F(r)$ versus the alternative hypothesis that the distribution of R is other than that specified]. One accepts the null hypothesis if $D_N < D^*(\alpha)$, where $D^*(\alpha)$ is such that $\text{Prob}\{D_N > D^*(\alpha)\} = \alpha$. This test is called the Kolmogorov-Smirnov goodness-of-fit test (K-S test).

In contrast to the χ^2 goodness-of-fit test, the K-S test is applicable for all sample sizes and avoids the problem of the grouping the data. However, the K-S test in the previously described form is not applicable if any of the parameters of the hypothesized distribution have been estimated from the data. For the standard χ^2 test, this is addressed by reducing the degrees of freedom of the χ^2 distribution used (one for each parameter estimated from the data). For the K-S test, it is recognized (e.g., Massey 1951) that if the parameters of the hypothesized distribution are estimated from the data, then the critical value $D^*(\alpha)$ should be reduced, but the amount of the reduction necessary is not known in general. This means that if the standard $D^*(\alpha)$ values are used, then one is more likely to falsely accept the null hypothesis that the distribution has the hypothesized form. Using Monte Carlo calculation, Lilliefors (1967) estimated the appropriate critical values $D^*(\alpha)$ for the case when the hypothesized distribution is a normal distribution with mean and variance estimated from the data. These values can be applied for lognormal distributions as well since the statistic in Eq. B-2 has the same value whether or not the data are transformed. As expected, the estimated critical values in Lilliefors (1967) are smaller than those for

the more general K-S test. Table B.1 shows the critical values $D^*(\alpha)$ from Lilliefors (1967), as well as the standard values (from Massey 1951).

Table B.1. Critical values for the statistic used for goodness-of-fit tests

Sample size N	Critical $D^*(\alpha)$ for $\alpha=0.05^A$	Standard K-S Critical Value for $\alpha=0.05^B$
4	0.38	0.62
5	0.34	0.57
6	0.32	0.52
7	0.30	0.49
8	0.29	0.46
9	0.27	0.43
10	0.26	0.41
11	0.25	0.39
12	0.24	0.38
13	0.23	0.36
14	0.23	0.35
15	0.22	0.34
16	0.21	0.33
17	0.21	0.32
18	0.20	0.31
19	0.20	0.30
20	0.19	0.29
25	0.18	0.27
30	0.16	0.24
Over 30	$\sim 0.886 N^{-1/2}$	$\sim 1.36 N^{-1/2}$

^A Calculated from Monte Carlo analysis in Lilliefors (1967).

^B Massey (1951).

The K-S test, using the appropriate critical values from Lilliefors (1967), was applied to the different cylinder populations. If the sample size was not one of those in Table B.1, then the critical value for the next highest sample size in Table B.1 was used for sample sizes < 30 and the asymptotic approximation for sample sizes above 30. The results of these tests are summarized in Table B.2. In all cases considered, the null hypothesis that the distributions were lognormal could be accepted at the 0.05 level of significance.

Table B.2. Results of Kolmogorov-Smirnov goodness-of-fit tests

Yard	Population	Sample Size N	D_N	$D_N(0.05)$	Accept or Reject that Distribution is Lognormal
F/G/K/L	All	94	0.04	0.09	Accept
	Top row	39	0.06	0.14	Accept
	Bottom	55	0.06	0.12	Accept
F/G	All	52	0.12	0.12	Accept
	Top row	22	0.13	0.18	Accept
	Bottom row	30	0.10	0.16	Accept
F	All	26	0.12	0.16	Accept
	Top row	13	0.11	0.23	Accept
	Bottom row	13	0.18	0.23	Accept
G	All	26	0.14	0.16	Accept
	Top row	9	0.17	0.27	Accept
	Bottom row	17	0.11	0.21	Accept
K/L	All	42	0.06	0.14	Accept
	Top row	17	0.12	0.21	Accept
	Bottom row	25	0.11	0.18	Accept

Comparison of Cylinder Populations

Before combining certain cylinder populations, statistical tests were performed to determine if it was likely that the populations were too "different" in a statistically meaningful sense. To this end, the t -test with unequal variances was used to determine if the medians were equal (the usual t -test requires that the variances of the populations being compared are equal). The results of the goodness-of-fit tests indicated that it was reasonable to assume that the distribution of rates was lognormally distributed for each subpopulation considered. This then implies that the logarithm of the corrosion rates are normally distributed, in which case the t -test with unequal variances is applicable to the logarithm of the corrosion rates. The t -test is actually a test for means, but the median is equal to the mean for normal distributions. Therefore, if we can accept or reject the hypothesis that the medians of the logarithms are not equal, then we can make the same conclusion for the exponential of the random variables.

For two normally distributed random variables X and Y , let m_X and m_Y denote the sample means and s_X and s_Y denote the sample standard deviations from samples of sizes n_X and n_Y from the populations

X and Y , respectively. The purpose of the t -test is to test the null hypothesis that the means μ_X and μ_Y of X and Y are equal, versus the alternative hypothesis that they are not equal. The statistic used to test this hypothesis is given by

$$t' = \frac{m_X - m_Y}{\sqrt{s_X^2/n_X + s_Y^2/n_Y}} \quad (\text{B-3})$$

By Satterthwaite's approximation (e.g., see Casella and Berger 1990), this random variable can be approximated by a t -distribution with degrees of freedom $\hat{v}$ given by

$$\hat{v} = \frac{\left(s_X^2/n_X + s_Y^2/n_Y \right)^2}{\frac{s_X^4}{n_X^2(n_X-1)} + \frac{s_Y^4}{n_Y^2(n_Y-1)}} \quad (\text{B-4})$$

For a given confidence level α , the hypothesis that the means are equal is rejected if t' is too large or too small. In particular, the hypothesis is rejected if $t' < -t_{\hat{v}}(\alpha/2)$ or $t' > t_{\hat{v}}(\alpha/2)$, where $t_{\hat{v}}(\alpha/2)$ is the upper $\alpha/2$ percentile of the t -distribution with $\hat{v}$ degrees of freedom; i.e.,

$$\int_{t_{\hat{v}}(\alpha/2)}^{\infty} f(t, \hat{v}) dt = \alpha/2 \quad (\text{B-5})$$

where

$$f(t, v) = \frac{\Gamma\left(\frac{v+1}{2}\right)}{\Gamma\left(\frac{v}{2}\right)} (\pi v)^{-1/2} (1 + t^2/v)^{-(v+1)/2} \quad (\text{B-6})$$

The slightly different test of testing the null hypothesis that the means are equal versus the alternative hypothesis that one mean is larger than the other can be performed using the one-tail probabilities from the t -distribution. For example, we would reject the hypothesis that the means are equal versus the alternative hypothesis that $\mu_X > \mu_Y$ if $t' > t_{\hat{v}}(\alpha)$.

Table B.3 shows the results of applying the t -test with unequal variances to the various cylinder populations. These results suggest that for every yard, there is a statistically significant difference between the top and bottom row cylinders, and hence these populations should not be combined.

The different subsets of the G yard cylinders were also compared. These cylinders consisted of what were considered to be four populations (Blue 1995a): (1) 4 top row cylinders that were set aside to see results for 30-year old top row cylinders (11575, 14293, 18660, and 13298), (2) 4 bottom row cylinders that had been measured previously with hand-held instruments (11636, 14666, 16036, 16121), (3) 11 bottom row cylinders from two rows that had been set aside because of suspected bottom corrosion (10375, 10232, 10499, 11954, 13193, 16027, 17660, 17695, 18071, 18592, 18651); and (4) 7 cylinders that had been set aside as part of a 1 in 10 sampling plan program initiated for the current

relocation and improvement of G yard (13167, 14418, 16306, 17587, 17640, 17734, 18012). It was found that one could accept the hypothesis that the medians were equal when comparing the top row and bottom row subsets of these populations for populations with more than 2 cylinders. Although presented in Table B.3 for completeness, the accuracy of the results of comparing the population of bottom row cylinders from set 4 with the other bottom row populations is suspect due to the small sample size (2) and the fact that the *t*-test used is itself based on an approximation. Within these constraints, it was deemed acceptable to combine the populations.

In comparing the cylinder populations across yards, the only two populations for which one cannot reject the null hypothesis that the medians are equal are for the F and G yards top row cylinders, the F/G and K/L yards bottom row cylinders, and the G yard and K/L yard bottom row cylinders.

The age-averaged corrosion rates seem to be lower for the bottom row cylinders in F yard, compared to the G yard and K/L yard cylinders. Because most (15) of the G yard cylinders inspected were selected because of suspected ground side corrosion (Blue 1995b), the G yard results are not surprising. However, the K/L yard bottom row cylinders are stored on 5-in. concrete saddles in a drained yard, and settling of the saddles is limited to a fraction of an inch (Blue 1995b). Because the F yard cylinders are at least 12 years older than those in the K/L yard, it may be that the corrosion rates for the F yard cylinders have slowed, while this has not occurred yet for the K/L yard cylinders. As a result, the age-averaged corrosion rates for F yards would be expected to be lower than that for K/L yard. However, this must remain speculation without corrosion data from previous time periods.

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Table B.3. Results of tests comparing different cylinder populations. Level of confidence $\alpha=0.05$ (see text for explanation of notation)

Population 1			Population 2			$\hat{v}$	t'	$t_0(\alpha/2)$		$t_0(\alpha)$	Accept or Reject that medians are equal at 0.05 confidence level?
Name	Sample Size	Logarithmic m, s^*	Name	Sample Size	Logarithmic m, s^*			$t_0(\alpha/2)$	$t_0(\alpha/2)$		
F/G yards:Bottom	30	0.73,0.52	K/L yards:Bottom	25	0.67,0.35	51	0.47	-2.01	2.01	1.68	A
F/G yards:Top	22	-0.01,0.26	K/L yards:Top	17	0.48,0.27	34	-5.73	-2.03	2.03	1.69	Reject
F yard:Bottom	13	0.34,0.46	G yard:Bottom	17	1.02,0.33	21	-4.51	-2.09	2.09	1.72	Reject
F yard:Top	13	-0.05,0.31	G yard:Top	9	0.06,0.16	19	-1.09	-2.10	2.10	1.73	A
F yard:Bottom	13	0.34,0.46	K/L yards:Bottom	25	0.67,0.35	19	-2.27	-2.09	2.09	1.73	Reject
F yard:Top	13	-0.05,0.31	K/L yards:Top	17	0.48,0.27	24	-4.96	-2.07	2.07	1.71	Reject
G yard:Bottom	17	1.02,0.33	K/L yards:Bottom	25	0.67,0.35	36	3.29	-2.03	2.03	1.69	Reject
G yard:Top	9	0.06,0.16	K/L yards:Top	17	0.48,0.27	24	-5.06	-2.07	2.07	1.71	Reject
F/G/K/L yards:Bottom	55	0.70,0.45	F/G/K/L yards:Top	39	0.21,0.36	91	5.95	-1.99	1.99	1.66	Reject
F/G yards:Bottom	30	0.73,0.52	F/G yards:Top	22	-0.01,0.26	45	6.70	-2.01	2.01	1.68	Reject
F yard:Bottom	13	0.34,0.46	F yard:Top	13	-0.05,0.31	21	2.53	-2.09	2.09	1.72	Reject
G yard:Bottom	17	1.02,0.33	G yard:Top	9	0.06,0.16	24	10.02	-2.07	2.07	1.71	Reject
K/L yards:Bottom	25	0.67,0.35	K/L yards:Top	17	0.48,0.27	39	1.97	-2.02	2.02	1.68	A
G yard: Set 1 (top)	4	0.16, 0.11	G yard: Set 4 top	5	-0.03, 0.15	7	2.20	-2.45	2.45	1.94	A
G yard: Set 2 (bottom)	4	1.09, 0.29	G yard: Set 3 (bottom)	11	0.81, 0.43	8	1.46	-2.31	2.31	1.86	A
G yard: Set 2 (bottom)	4	1.09, 0.29	G yard: Set 4 (bottom)	2	0.51, 0.13	4	3.41	-3.18	3.18	2.35	Reject
G yard: Set 3 (bottom)	11	0.81, 0.43	G yard: Set 4 (bottom)	2	0.51, 0.13	6	1.89	-2.45	2.45	1.94	A

* These are the mean and standard deviation of the natural logarithm of the values. They are used in the t-test comparing medians (means).

APPENDIX C: INTERMEDIATE RESULTS

The intermediate calculations used in the construction of Tables 2 and 3 are provided in this appendix.

Yard Choice	3
Row (1=bottom,2=top)	1
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-F yard bottom row cylinders (2229 cylinders)
Yard La Mean	0.338
Yard La StDev	0.483
Thick	13
alpha	0.95
Yard Mean	1.540 (mils)
Yard StDev	0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)									
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr.									
Manufacture Date	Number	Prob.	1996 #	Prob.	2000 #	Prob.	2010 #	Prob.	2020 #
1958	295	8.82E-05	0.03	2.04E-04	0.06	1.06E-03	0.31	3.54E-03	1.04
1959	134	7.00E-05	0.01	1.68E-04	0.02	9.19E-04	0.12	3.18E-03	0.43
1960	270	5.50E-05	0.01	1.36E-04	0.04	7.94E-04	0.21	2.85E-03	0.77
1961	242	4.28E-05	0.01	1.10E-04	0.03	6.83E-04	0.17	2.55E-03	0.62
1962	131	3.29E-05	0.00	8.82E-05	0.01	5.85E-04	0.08	2.27E-03	0.30
1963	19	2.50E-05	0.00	7.00E-05	0.00	4.98E-04	0.01	2.02E-03	0.04
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	5.16E-06	0.00	1.88E-05	0.00	2.04E-04	0.01	1.06E-03	0.05
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	1.62E-06	0.00	7.30E-06	0.00	1.10E-04	0.00	6.83E-04	0.01
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	6.65E-07	0.00	3.58E-06	0.00	7.00E-05	0.00	4.98E-04	0.03
1974	1	4.09E-07	0.00	2.43E-06	0.00	5.50E-05	0.00	4.22E-04	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	1.40E-07	0.00	1.05E-06	0.00	3.29E-05	0.01	2.97E-04	0.10
1977	178	7.70E-08	0.00	6.65E-07	0.00	2.50E-05	0.00	2.47E-04	0.04
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	2.03E-08	0.00	2.43E-07	0.00	1.39E-05	0.00	1.68E-04	0.01
1980	105	9.61E-09	0.00	1.40E-07	0.00	1.02E-05	0.00	1.36E-04	0.01
1981	151	4.25E-09	0.00	7.70E-08	0.00	7.30E-06	0.00	1.10E-04	0.02
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	5.11E-15	0.00	1.64E-11	0.00	1.40E-07	0.00	1.02E-05	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	0.07	Total >	0.16	Total >	0.94	Total >	3.47
Upper 95% Confidence Limits									
Manufacture Date	Number	Prob.	1996 #	Prob.	2000 #	Prob.	2010 #	Prob.	2020 #
1958	295	8.45E-03	2.49	1.25E-02	3.69	2.72E-02	8.01	4.84E-02	14.27
1959	134	7.59E-03	1.02	1.14E-02	1.53	2.54E-02	3.40	4.60E-02	6.16
1960	270	6.79E-03	1.83	1.04E-02	2.80	2.37E-02	6.40	4.36E-02	11.78
1961	242	6.04E-03	1.46	9.37E-03	2.27	2.21E-02	5.34	4.13E-02	10.00
1962	131	5.35E-03	0.70	8.45E-03	1.11	2.05E-02	2.69	3.91E-02	5.12
1963	19	4.72E-03	0.09	7.59E-03	0.14	1.90E-02	0.36	3.70E-02	0.70
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	2.28E-03	0.11	4.13E-03	0.19	1.25E-02	0.59	2.72E-02	1.28
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	1.34E-03	0.02	2.68E-03	0.04	9.37E-03	0.15	2.21E-02	0.35
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	8.95E-04	0.05	1.93E-03	0.12	7.59E-03	0.46	1.90E-02	1.16
1974	1	7.17E-04	0.00	1.62E-03	0.00	6.79E-03	0.01	1.76E-02	0.02
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	4.40E-04	0.14	1.10E-03	0.35	5.35E-03	1.72	1.49E-02	4.79
1977	178	3.36E-04	0.06	8.95E-04	0.16	4.72E-03	0.84	1.37E-02	2.43
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	1.84E-04	0.01	5.66E-04	0.03	3.60E-03	0.19	1.14E-02	0.59
1980	105	1.31E-04	0.01	4.40E-04	0.05	3.11E-03	0.33	1.04E-02	1.09
1981	151	9.06E-05	0.01	3.36E-04	0.05	2.68E-03	0.40	9.37E-03	1.42
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	9.54E-07	0.00	6.68E-06	0.00	4.40E-04	0.09	3.11E-03	0.64
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	8.02	Total >	12.53	Total >	30.97	Total >	61.80

Yard Choice	3
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	250
Yard Name	C-745-F yard bottom row cylinders (2229 cylinders)
Yard Lab Mean	0.338
Yard Lab Std Dev	0.463
Thickness	13
alpha	0.95
Yard Mean	1.540 (mils)
Yard Std Dev	0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)									
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr									
Manufacture Date		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	295	5.13E-01	151.29	5.98E-01	176.44	7.61E-01	224.52	8.62E-01	254.31
1959	134	4.90E-01	65.64	5.78E-01	77.43	7.48E-01	100.22	8.54E-01	114.46
1960	270	4.66E-01	125.90	5.57E-01	150.35	7.34E-01	198.19	8.46E-01	228.39
1961	242	4.42E-01	107.01	5.35E-01	129.52	7.20E-01	174.12	8.37E-01	202.58
1962	131	4.18E-01	54.71	5.13E-01	67.18	7.04E-01	92.27	8.28E-01	108.45
1963	19	3.93E-01	7.46	4.90E-01	9.31	6.88E-01	13.08	8.18E-01	15.54
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	2.65E-01	12.46	3.67E-01	17.26	5.98E-01	28.11	7.61E-01	35.77
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	1.92E-01	3.06	2.91E-01	4.65	5.35E-01	8.56	7.20E-01	11.51
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	1.46E-01	8.93	2.40E-01	14.65	4.90E-01	29.88	6.88E-01	41.99
1974	1	1.25E-01	0.13	2.15E-01	0.22	4.66E-01	0.47	6.72E-01	0.67
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	8.78E-02	28.19	1.68E-01	54.06	4.18E-01	134.05	6.36E-01	204.29
1977	178	7.14E-02	12.72	1.46E-01	26.04	3.93E-01	69.88	6.18E-01	109.94
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	4.41E-02	2.29	1.06E-01	5.50	3.42E-01	17.77	5.78E-01	30.05
1980	105	3.32E-02	3.48	8.78E-02	9.22	3.16E-01	33.20	5.57E-01	58.47
1981	151	2.41E-02	3.64	7.14E-02	10.79	2.91E-01	43.88	5.35E-01	80.81
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	3.83E-05	0.01	2.18E-03	0.45	8.78E-02	18.09	3.16E-01	65.13
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total ->	586.92	Total ->	753.07	Total ->	1186.29	Total ->	1562.37
Upper 95% Confidence Limits									
Manufacture Date		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	295	6.87E-01	202.72	7.60E-01	224.26	8.57E-01	261.65	9.51E-01	280.55
1959	134	6.67E-01	89.37	7.43E-01	99.59	8.78E-01	117.59	9.47E-01	126.85
1960	270	6.46E-01	174.39	7.25E-01	195.84	8.68E-01	234.23	9.42E-01	254.30
1961	242	6.24E-01	151.03	7.07E-01	171.01	8.57E-01	207.34	9.37E-01	226.67
1962	131	6.02E-01	78.81	6.87E-01	90.02	8.45E-01	110.73	9.31E-01	121.97
1963	19	5.78E-01	10.99	6.67E-01	12.67	8.33E-01	15.83	9.25E-01	17.58
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	4.54E-01	21.36	5.55E-01	26.07	7.60E-01	35.73	8.87E-01	41.69
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	3.76E-01	6.01	4.80E-01	7.68	7.07E-01	11.31	8.57E-01	13.71
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	3.22E-01	19.67	4.28E-01	26.13	6.67E-01	40.68	8.33E-01	50.82
1974	1	2.96E-01	0.30	4.02E-01	0.40	6.46E-01	0.65	8.20E-01	0.82
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	2.44E-01	78.26	3.49E-01	112.04	6.02E-01	193.13	7.92E-01	254.17
1977	178	2.18E-01	38.87	3.22E-01	57.39	5.78E-01	102.97	7.66E-01	138.20
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	1.70E-01	8.82	2.70E-01	14.02	5.30E-01	27.58	7.43E-01	38.65
1980	105	1.46E-01	15.38	2.44E-01	25.60	5.06E-01	53.08	7.25E-01	76.16
1981	151	1.25E-01	18.80	2.18E-01	32.97	4.80E-01	72.51	7.07E-01	106.71
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	5.74E-03	1.18	3.83E-02	7.89	2.44E-01	50.22	5.06E-01	104.14
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total ->	915.96	Total ->	1103.60	Total ->	1535.23	Total ->	1852.96

Yard Choice	3
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	312.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-F yard bottom row cylinders (2229 cylinders)
Yard La Mean	0.338
Yard La StDev	0.483
ThickN	13
alpha	0.95
Yard Mean	1.540 (mils)
Yard StDev	0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)							
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr.							
Manufacture Date	Number	1996 Prob.	1996 #	2000 Prob.	2000 #	2010 Prob.	2020 Prob.
1958	295	6.65E-05	0.02	1.56E-04	0.05	8.35E-04	0.25
1959	134	5.25E-05	0.01	1.28E-04	0.02	7.23E-04	0.10
1960	270	4.11E-05	0.01	1.04E-04	0.03	6.23E-04	0.17
1961	242	3.19E-05	0.01	8.33E-05	0.02	5.34E-04	0.13
1962	131	2.44E-05	0.00	6.65E-05	0.01	4.56E-04	0.06
1963	19	1.85E-05	0.00	5.25E-05	0.00	3.87E-04	0.01
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	3.72E-06	0.00	1.38E-05	0.00	1.56E-04	0.01
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	1.15E-06	0.00	5.30E-06	0.00	8.33E-05	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	4.66E-07	0.00	2.57E-06	0.00	5.25E-05	0.00
1974	1	2.85E-07	0.00	1.74E-06	0.00	4.11E-05	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	9.58E-08	0.00	7.42E-07	0.00	2.44E-05	0.01
1977	178	5.25E-08	0.00	4.66E-07	0.00	1.85E-05	0.00
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	1.36E-08	0.00	1.68E-07	0.00	1.02E-05	0.00
1980	105	6.39E-09	0.00	9.38E-08	0.00	7.40E-06	0.00
1981	151	2.80E-09	0.00	5.25E-08	0.00	5.30E-06	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	2.89E-15	0.00	1.01E-11	0.00	9.58E-08	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	0.05	Total >	0.12	Total >	0.73
Upper 95% Confidence Limits							
Manufacture Date	Number	1996 Prob.	1996 #	2000 Prob.	2000 #	2010 Prob.	2020 Prob.
1958	295	7.41E-03	2.19	1.10E-02	3.25	2.43E-02	7.16
1959	134	6.65E-03	0.89	1.00E-02	1.35	2.27E-02	3.04
1960	270	5.93E-03	1.60	9.11E-03	2.46	2.11E-02	5.70
1961	242	5.27E-03	1.28	8.23E-03	1.99	1.96E-02	4.75
1962	131	4.66E-03	0.61	7.41E-03	0.97	1.82E-02	2.39
1963	19	4.10E-03	0.08	6.65E-03	0.13	1.69E-02	0.32
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	1.96E-03	0.09	3.59E-03	0.17	1.10E-02	0.52
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	1.15E-03	0.02	2.31E-03	0.04	8.23E-03	0.13
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	7.61E-04	0.05	1.66E-03	0.10	6.65E-03	0.41
1974	1	6.08E-04	0.00	1.39E-03	0.00	5.93E-03	0.01
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	3.71E-04	0.12	9.40E-04	0.30	4.66E-03	1.50
1977	178	2.82E-04	0.05	7.61E-04	0.14	4.10E-03	0.73
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	1.54E-04	0.01	4.79E-04	0.02	3.12E-03	0.16
1980	105	1.09E-04	0.01	3.71E-04	0.04	2.69E-03	0.28
1981	151	7.53E-05	0.01	2.82E-04	0.04	2.31E-03	0.35
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	9.54E-07	0.00	5.72E-06	0.00	3.71E-04	0.08
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	7.00	Total >	11.00	Total >	27.51
		Total >	55.44				

Yard Choice	3
Row (1=bottom,2=top)	1
InitialThickness (mils)	312.5 (mils)
FailureLevel (mils)	250
YardName	C-745-F yard bottom row cylinders (2229 cylinders)
YardLaMean	0.338
YardLaStdDev	0.463
ThcN	13
alpha	0.95
Yard Mean	1.540 (mils)
Yard StdDev	0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)										
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr										
Manufacture Date		Number	1996	2000	2010	2020				
			Prob.	#	Prob.	#	Prob.	#		
1958		295	3.65E-01	107.75	4.49E-01	132.45	6.30E-01	185.99	7.62E-01	224.82
1959		134	3.44E-01	46.07	4.28E-01	57.42	6.15E-01	82.35	7.51E-01	100.65
1960		270	3.22E-01	87.03	4.08E-01	110.06	5.98E-01	161.49	7.40E-01	199.71
1961		242	3.01E-01	72.80	3.87E-01	93.55	5.81E-01	140.63	7.28E-01	176.11
1962		131	2.79E-01	36.60	3.65E-01	47.85	5.64E-01	73.84	7.15E-01	93.71
1963		19	2.58E-01	4.90	3.44E-01	6.53	5.46E-01	10.37	7.02E-01	13.35
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968		47	1.58E-01	7.41	2.37E-01	11.14	4.49E-01	21.10	6.30E-01	29.63
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971		16	1.06E-01	1.69	1.77E-01	2.83	3.87E-01	6.18	5.81E-01	9.30
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973		61	7.65E-02	4.67	1.39E-01	8.51	3.44E-01	20.97	5.46E-01	33.29
1974		1	6.36E-02	0.06	1.22E-01	0.12	3.22E-01	0.32	5.27E-01	0.53
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976		321	4.17E-02	13.40	9.06E-02	29.08	2.79E-01	89.68	4.89E-01	156.95
1977		178	3.28E-02	5.83	7.65E-02	13.62	2.58E-01	45.94	4.69E-01	83.51
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979		52	1.87E-02	0.97	5.20E-02	2.71	2.16E-01	11.26	4.28E-01	22.28
1980		105	1.35E-02	1.41	4.17E-02	4.38	1.96E-01	20.61	4.08E-01	42.80
1981		151	9.33E-03	1.41	3.28E-02	4.95	1.77E-01	26.67	3.87E-01	58.37
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990		206	7.40E-06	0.00	6.23E-04	0.13	4.17E-02	8.60	1.96E-01	40.43
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total		2229	Total >	392.01	Total >	525.32	Total >	906.01	Total >	1285.43
Upper 95% Confidence Limits										
Manufacture Date		Number	1996	2000	2010	2020				
			Prob.	#	Prob.	#	Prob.	#		
1958		295	5.53E-01	163.08	6.30E-01	185.93	7.87E-01	232.15	8.88E-01	261.87
1959		134	5.32E-01	71.34	6.12E-01	81.96	7.74E-01	103.70	8.80E-01	117.90
1960		270	5.12E-01	138.12	5.92E-01	159.96	7.60E-01	205.26	8.72E-01	235.34
1961		242	4.90E-01	118.67	5.73E-01	138.63	7.46E-01	180.52	8.63E-01	208.81
1962		131	4.69E-01	61.43	5.53E-01	72.42	7.31E-01	95.78	8.54E-01	111.83
1963		19	4.47E-01	3.50	5.32E-01	10.11	7.16E-01	13.60	8.44E-01	16.03
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968		47	3.36E-01	15.80	4.25E-01	19.99	6.30E-01	29.62	7.87E-01	36.99
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971		16	2.70E-01	4.32	3.59E-01	5.74	5.73E-01	9.17	7.46E-01	11.94
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973		61	2.26E-01	13.81	3.14E-01	19.15	5.32E-01	32.47	7.16E-01	43.66
1974		1	2.05E-01	0.21	2.92E-01	0.29	5.12E-01	0.51	7.00E-01	0.70
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976		321	1.65E-01	52.91	2.48E-01	79.58	4.69E-01	150.53	6.66E-01	213.81
1977		178	1.46E-01	25.91	2.26E-01	40.31	4.47E-01	79.61	6.48E-01	115.42
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979		52	1.10E-01	5.70	1.85E-01	9.61	4.03E-01	20.96	6.12E-01	31.80
1980		105	9.30E-02	9.76	1.65E-01	17.31	3.81E-01	40.00	5.92E-01	62.21
1981		151	7.76E-02	11.72	1.46E-01	21.98	3.59E-01	54.15	5.73E-01	86.50
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990		206	2.69E-03	0.55	2.11E-02	4.35	1.65E-01	33.96	3.81E-01	78.47
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total		2229	Total >	701.83	Total >	867.32	Total >	1281.99	Total >	1633.28

Yard Choice	3
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	329 (mils)
Failure Level (mils)	0
Yard Name	C-745-F yard bottom row cylinders (2229 cylinders)
Yard Ln Mean	0.338
Yard Ln StDev	0.463
Thick	13
alpha	0.95
Yard Mean	1.540 (mils)
Yard StDev	0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)										
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming Initial thickness of 329.8 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr.										
Manufacture Date		Number	1996		2000		2010		2020	
			Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958		295	4.21E-05	0.01	1.01E-04	0.03	5.68E-04	0.17	2.02E-03	0.60
1959		134	3.31E-05	0.00	8.23E-05	0.01	4.89E-04	0.07	1.81E-03	0.24
1960		270	2.57E-05	0.01	6.64E-05	0.02	4.20E-04	0.11	1.61E-03	0.44
1961		242	1.98E-05	0.00	5.31E-05	0.01	3.59E-04	0.09	1.43E-03	0.35
1962		131	1.51E-05	0.00	4.21E-05	0.01	3.05E-04	0.04	1.27E-03	0.17
1963		19	1.13E-05	0.00	3.31E-05	0.00	2.57E-04	0.00	1.12E-03	0.02
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968		47	2.20E-05	0.00	3.41E-06	0.00	1.01E-04	0.00	5.68E-04	0.03
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971		16	6.61E-07	0.00	3.15E-06	0.00	5.31E-05	0.00	3.59E-04	0.01
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973		61	2.63E-07	0.00	1.50E-06	0.00	3.31E-05	0.00	2.57E-04	0.02
1974		1	1.59E-07	0.00	1.01E-06	0.00	2.57E-05	0.00	2.16E-04	0.00
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976		321	5.24E-08	0.00	4.23E-07	0.00	1.51E-05	0.00	1.50E-04	0.05
1977		178	2.83E-08	0.00	2.63E-07	0.00	1.13E-05	0.00	1.24E-04	0.02
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979		52	7.17E-09	0.00	9.25E-08	0.00	6.16E-06	0.00	8.23E-05	0.00
1980		105	3.31E-09	0.00	5.24E-08	0.00	4.44E-06	0.00	6.64E-05	0.01
1981		151	1.43E-09	0.00	2.83E-08	0.00	3.15E-06	0.00	5.31E-05	0.01
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990		206	1.22E-15	0.00	4.71E-12	0.00	5.24E-08	0.00	4.44E-06	0.00
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total		2229	Total >	0.03	Total >	0.08	Total >	0.49	Total >	1.95
Upper 95% Confidence Limits										
Manufacture Date		Number	1996		2000		2010		2020	
			Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958		295	6.00E-03	1.77	9.01E-03	2.66	2.02E-02	5.96	3.70E-02	10.91
1959		134	5.36E-03	0.72	8.18E-03	1.10	1.83E-02	2.53	3.50E-02	4.70
1960		270	4.78E-03	1.29	7.41E-03	2.00	1.75E-02	4.73	3.32E-02	8.96
1961		242	4.23E-03	1.02	6.68E-03	1.62	1.63E-02	3.94	3.14E-02	7.59
1962		131	3.73E-03	0.49	6.00E-03	0.79	1.51E-02	1.98	2.96E-02	3.88
1963		19	3.27E-03	0.06	5.36E-03	0.10	1.39E-02	0.26	2.79E-02	0.53
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968		47	1.54E-03	0.07	2.85E-03	0.13	9.01E-03	0.42	2.02E-02	0.95
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971		16	8.92E-04	0.01	1.82E-03	0.03	6.68E-03	0.11	1.63E-02	0.26
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973		61	5.86E-04	0.04	1.30E-03	0.08	5.36E-03	0.33	1.39E-02	0.83
1974		1	4.66E-04	0.00	1.08E-03	0.00	4.78E-03	0.00	1.28E-02	0.01
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976		321	2.82E-04	0.09	7.27E-04	0.23	3.73E-03	1.20	1.08E-02	3.47
1977		178	2.14E-04	0.04	5.86E-04	0.10	3.27E-03	0.58	9.89E-03	1.76
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979		52	1.14E-04	0.01	3.66E-04	0.02	2.47E-03	0.13	8.18E-03	0.43
1980		105	8.11E-05	0.01	2.82E-04	0.03	2.13E-03	0.22	7.41E-03	0.78
1981		151	5.53E-05	0.01	2.14E-04	0.03	1.82E-03	0.27	6.68E-03	1.01
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990		206	9.54E-07	0.00	3.81E-06	0.00	2.82E-04	0.06	2.13E-03	0.44
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total		2229	Total >	5.63	Total >	8.92	Total >	22.73	Total >	46.51

Yard Choice	3
Row (1=bottom,2=top)	1
Initial Thickness (mils)	329 (mils)
Failure Level (mils)	250
Yard Name	C-745-F yard bottom row cylinders (2229 cylinders)
Yard Lat/Long	0.338
Yard Lat/Long Dev	0.463
Thick	13
alpha	0.95
Yard Mean	1.540 (mils)
Yard StDev	0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)									
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	295	1.98E-01	58.27	2.63E-01	77.57	4.31E-01	127.25	5.82E-01	171.69
1959	134	1.82E-01	24.38	2.46E-01	33.00	4.15E-01	55.60	5.68E-01	76.14
1960	270	1.67E-01	45.01	2.30E-01	62.03	3.98E-01	107.55	5.54E-01	149.62
1961	242	1.52E-01	36.77	2.13E-01	51.66	3.82E-01	92.34	5.40E-01	130.63
1962	131	1.38E-01	18.04	1.98E-01	25.88	3.65E-01	47.78	5.25E-01	68.79
1963	19	1.24E-01	2.36	1.82E-01	3.46	3.48E-01	6.61	5.10E-01	9.69
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	6.55E-02	3.08	1.11E-01	5.21	2.63E-01	12.36	4.31E-01	20.27
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	3.96E-02	0.63	7.57E-02	1.21	2.13E-01	3.42	3.82E-01	6.11
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	2.65E-02	1.62	5.61E-02	3.42	1.82E-01	11.10	3.48E-01	21.21
1974	1	2.11E-02	0.02	4.74E-02	0.05	1.67E-01	0.17	3.31E-01	0.33
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	1.26E-02	4.06	3.27E-02	10.48	1.38E-01	44.20	2.97E-01	95.25
1977	178	9.44E-03	1.68	2.65E-02	4.72	1.24E-01	22.07	2.80E-01	49.80
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	4.83E-03	0.25	1.65E-02	0.86	9.85E-02	5.12	2.46E-01	12.80
1980	105	3.27E-03	0.34	1.26E-02	1.33	8.67E-02	9.11	2.30E-01	24.12
1981	151	2.13E-03	0.32	9.44E-03	1.43	7.57E-02	11.44	2.13E-01	32.24
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	6.57E-07	0.00	9.41E-05	0.02	1.26E-02	2.60	8.67E-02	17.87
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	196.82	Total >	282.31	Total >	558.70	Total >	886.57
Upper 95% Confidence Limits									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	295	3.82E-01	112.79	4.52E-01	133.40	6.14E-01	181.20	7.47E-01	220.28
1959	134	3.65E-01	48.87	4.35E-01	58.27	5.99E-01	80.29	7.35E-01	98.50
1960	270	3.47E-01	93.69	4.17E-01	112.71	5.84E-01	157.63	7.23E-01	195.21
1961	242	3.29E-01	79.70	4.00E-01	96.78	5.68E-01	137.50	7.11E-01	171.97
1962	131	3.12E-01	40.83	3.82E-01	50.09	5.52E-01	72.35	6.98E-01	91.42
1963	19	2.94E-01	5.59	3.65E-01	6.93	5.36E-01	10.19	6.85E-01	13.01
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	2.09E-01	9.80	2.77E-01	13.00	4.52E-01	21.25	6.14E-01	28.87
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	1.61E-01	2.57	2.25E-01	3.60	4.00E-01	6.40	5.68E-01	9.09
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	1.31E-01	7.97	1.92E-01	11.72	3.65E-01	22.25	5.36E-01	32.70
1974	1	1.17E-01	0.12	1.76E-01	0.18	3.47E-01	0.35	5.20E-01	0.52
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	9.02E-02	28.95	1.45E-01	46.65	3.12E-01	100.06	4.86E-01	156.12
1977	178	7.81E-02	13.90	1.31E-01	23.25	2.94E-01	52.36	4.69E-01	83.54
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	5.62E-02	2.92	1.03E-01	5.36	2.59E-01	13.49	4.35E-01	22.61
1980	105	4.66E-02	4.89	9.02E-02	9.47	2.42E-01	25.43	4.17E-01	43.83
1981	151	3.79E-02	5.72	7.81E-02	11.79	2.25E-01	34.01	4.00E-01	60.39
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	8.89E-04	0.18	8.71E-03	1.79	9.02E-02	18.58	2.42E-01	49.89
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	458.49	Total >	585.00	Total >	933.32	Total >	1277.96

Yard Choice	3
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	345.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-F yard bottom row cylinders (2229 cylinders)
Yard Ls Mean	0.338
Yard Ls StDev	0.463
Thb N	13
alpha	0.95
Yard Mean	1.540 (mils)
Yard StDev	0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)												
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr.												
Manufacture Date	Number	1996		2000		2010		2020				
		Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958	295	2.70E-05	0.01	6.63E-05	0.02	3.89E-04	0.11	1.44E-03	0.42			
1959	134	2.11E-05	0.00	5.36E-05	0.01	3.34E-04	0.04	1.28E-03	0.17			
1960	270	1.63E-05	0.00	4.30E-05	0.01	2.85E-04	0.08	1.14E-03	0.31			
1961	242	1.25E-05	0.00	3.42E-05	0.01	2.43E-04	0.06	1.01E-03	0.24			
1962	131	9.43E-06	0.00	2.70E-05	0.00	2.05E-04	0.03	8.91E-04	0.12			
1963	19	7.04E-06	0.00	2.11E-05	0.00	1.73E-04	0.00	7.83E-04	0.01			
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968	47	1.32E-06	0.00	5.19E-06	0.00	6.63E-05	0.00	3.89E-04	0.02			
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971	16	3.86E-07	0.00	1.90E-06	0.00	3.42E-05	0.00	2.43E-04	0.00			
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973	61	1.51E-07	0.00	8.95E-07	0.00	2.11E-05	0.00	1.73E-04	0.01			
1974	1	9.03E-08	0.00	5.95E-07	0.00	1.63E-05	0.00	1.44E-04	0.00			
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976	321	2.91E-08	0.00	2.45E-07	0.00	9.43E-06	0.00	9.92E-05	0.03			
1977	178	1.56E-08	0.00	1.51E-07	0.00	7.04E-06	0.00	8.14E-05	0.01			
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979	52	3.85E-09	0.00	5.23E-08	0.00	3.78E-06	0.00	5.36E-05	0.00			
1980	105	1.75E-09	0.00	2.91E-08	0.00	2.70E-06	0.00	4.30E-05	0.00			
1981	151	7.46E-10	0.00	1.56E-08	0.00	1.90E-06	0.00	3.42E-05	0.01			
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990	206	5.55E-16	0.00	2.24E-12	0.00	2.91E-08	0.00	2.70E-06	0.00			
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
Total	2229	Total >	0.02	Total >	0.05	Total >	0.34	Total >	1.37			
Upper 95% Confidence Limits												
Manufacture Date	Number	1996		2000		2010		2020				
		Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958	295	4.33E-03	1.44	7.40E-03	2.18	1.69E-02	4.99	3.14E-02	9.27			
1959	134	4.36E-03	0.58	6.71E-03	0.90	1.57E-02	2.11	2.97E-02	3.99			
1960	270	3.87E-03	1.04	6.06E-03	1.64	1.46E-02	3.95	2.81E-02	7.59			
1961	242	3.42E-03	0.83	5.45E-03	1.32	1.36E-02	3.28	2.65E-02	6.42			
1962	131	3.01E-03	0.39	4.88E-03	0.64	1.25E-02	1.64	2.50E-02	3.28			
1963	19	2.63E-03	0.05	4.36E-03	0.08	1.16E-02	0.22	2.35E-02	0.45			
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968	47	1.22E-03	0.06	2.29E-03	0.11	7.40E-03	0.35	1.69E-02	0.80			
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971	16	6.99E-04	0.01	1.45E-03	0.02	5.45E-03	0.09	1.36E-02	0.22			
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973	61	4.56E-04	0.03	1.02E-03	0.06	4.36E-03	0.27	1.16E-02	0.71			
1974	1	3.61E-04	0.00	8.50E-04	0.00	3.87E-03	0.00	1.06E-02	0.01			
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976	321	2.16E-04	0.07	5.68E-04	0.18	3.01E-03	0.97	8.93E-03	2.87			
1977	178	1.63E-04	0.03	4.56E-04	0.08	2.63E-03	0.47	8.14E-03	1.45			
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979	52	8.68E-05	0.00	2.82E-04	0.01	1.98E-03	0.10	6.71E-03	0.35			
1980	105	6.10E-05	0.01	2.16E-04	0.02	1.70E-03	0.18	6.06E-03	0.64			
1981	151	4.10E-05	0.01	1.63E-04	0.02	1.45E-03	0.22	5.45E-03	0.82			
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990	206	9.54E-07	0.00	2.85E-06	0.00	2.16E-04	0.04	1.70E-03	0.35			
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
Total	2229	Total >	4.55	Total >	7.28	Total >	18.88	Total >	39.19			

Yard Choice 3
 Row (1=bottom,2=top) 1
 InitialThickness (mils) 345.5 (mils)
 FailureLevel (mils) 250
 YardName C-745-F yard bottom row cylinders (2229 cylinders)
 YardLnMean 0.338
 YardLnStdDev 0.483
 TheN 13
 alpha 0.95
 YardMean 1.540 (mils)
 YardStdDev 0.663 (mils)

C-745-F yard bottom row cylinders (2229 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F yard bottom row cylinders (2229 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 1.54 and 0.66 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	295	1.04E-01	30.62	1.48E-01	43.73	2.80E-01	82.62	4.20E-01	123.80
1959	134	9.38E-02	12.57	1.37E-01	18.29	2.66E-01	35.66	4.05E-01	54.40
1960	270	8.43E-02	22.75	1.25E-01	33.80	2.52E-01	68.11	3.92E-01	105.90
1961	242	7.52E-02	18.21	1.14E-01	27.65	2.39E-01	57.72	3.78E-01	91.56
1962	131	6.67E-02	8.74	1.04E-01	13.60	2.25E-01	29.47	3.64E-01	47.73
1963	19	5.88E-02	1.12	9.38E-02	1.78	2.12E-01	4.02	3.50E-01	6.66
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	2.74E-02	1.29	5.14E-02	2.42	1.48E-01	6.97	2.80E-01	13.16
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	1.52E-02	0.24	3.26E-02	0.52	1.14E-01	1.83	2.39E-01	3.82
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	9.52E-03	0.58	2.28E-02	1.39	9.38E-02	5.72	2.12E-01	12.90
1974	1	7.33E-03	0.01	1.88E-02	0.02	8.43E-02	0.08	1.98E-01	0.20
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	4.06E-03	1.30	1.21E-02	3.29	6.67E-02	21.42	1.73E-01	55.44
1977	178	2.91E-03	0.52	9.52E-03	1.69	5.88E-02	10.47	1.60E-01	28.53
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	1.36E-03	0.07	5.52E-03	0.29	4.46E-02	2.32	1.37E-01	7.10
1980	105	8.78E-04	0.09	4.06E-03	0.43	3.83E-02	4.02	1.25E-01	13.14
1981	151	5.41E-04	0.08	2.91E-03	0.44	3.26E-02	4.92	1.14E-01	17.25
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	7.72E-08	0.00	1.71E-05	0.00	4.06E-03	0.84	3.83E-02	7.89
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	98.19	Total >	149.95	Total >	336.18	Total >	589.49

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	295	2.67E-01	78.72	3.25E-01	95.82	4.70E-01	138.54	6.04E-01	178.05
1959	134	2.53E-01	33.84	3.10E-01	41.57	4.55E-01	61.03	5.91E-01	79.19
1960	270	2.38E-01	64.38	2.96E-01	79.84	4.41E-01	119.11	5.78E-01	156.09
1961	242	2.24E-01	54.31	2.81E-01	68.06	4.27E-01	103.28	5.65E-01	136.76
1962	131	2.11E-01	27.59	2.67E-01	34.96	4.12E-01	54.02	5.52E-01	72.31
1963	19	1.97E-01	3.74	2.53E-01	4.80	3.98E-01	7.56	5.39E-01	10.23
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	47	1.33E-01	6.25	1.84E-01	8.63	3.25E-01	15.27	4.70E-01	22.07
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	16	9.88E-02	1.58	1.45E-01	2.32	2.81E-01	4.50	4.27E-01	6.83
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	61	7.84E-02	4.78	1.21E-01	7.39	2.53E-01	15.41	3.98E-01	24.27
1974	1	6.89E-02	0.07	1.10E-01	0.11	2.38E-01	0.24	3.83E-01	0.38
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	321	5.17E-02	16.61	8.84E-02	28.36	2.11E-01	67.61	3.54E-01	113.65
1977	178	4.40E-02	7.84	7.84E-02	13.95	1.97E-01	35.07	3.39E-01	60.42
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	52	3.06E-02	1.59	6.00E-02	3.12	1.71E-01	8.87	3.10E-01	16.13
1980	105	2.48E-02	2.61	5.17E-02	5.43	1.58E-01	16.56	2.96E-01	31.05
1981	151	1.98E-02	2.98	4.40E-02	6.65	1.45E-01	21.92	2.81E-01	42.46
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	206	3.37E-04	0.07	3.95E-03	0.81	5.17E-02	10.66	1.58E-01	32.48
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	2229	Total >	306.97	Total >	401.83	Total >	679.62	Total >	982.37

Yard Choice	4
Row (1=bottom,2=top)	1
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-G yard bottom row cylinders (3622 cylinders)
Yard Ln Mean	1.021
Yard Ln StDev	0.332
The N	17
alpha	0.95
Yard Mean	2.825 (mils)
Yard StDev	0.979 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)													
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr.													
Manufacture Date		Number	1996		2000		2010		2020				
			Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958		583	7.46E-04	0.43	2.02E-03	1.18	1.29E-02	7.50	4.46E-02	25.99			
1959		553	5.63E-04	0.31	1.60E-03	0.89	1.10E-02	6.11	4.02E-02	22.21			
1960		553	4.20E-04	0.23	1.26E-03	0.70	9.42E-03	5.21	3.60E-02	19.93			
1961		442	3.08E-04	0.14	9.74E-04	0.43	7.99E-03	3.53	3.22E-02	14.23			
1962		255	2.23E-04	0.06	7.46E-04	0.19	6.72E-03	1.71	2.87E-02	7.31			
1963		10	1.58E-04	0.00	5.63E-04	0.01	5.62E-03	0.06	2.54E-02	0.25			
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968		45	2.09E-05	0.00	1.10E-04	0.00	2.02E-03	0.09	1.29E-02	0.58			
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971		26	4.52E-06	0.00	3.28E-05	0.00	9.74E-04	0.03	7.99E-03	0.21			
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973		340	1.36E-06	0.00	1.29E-05	0.00	5.63E-04	0.19	5.62E-03	1.91			
1974		173	7.02E-07	0.00	7.77E-06	0.00	4.20E-04	0.07	4.66E-03	0.81			
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976		499	1.59E-07	0.00	2.53E-06	0.00	2.23E-04	0.11	3.13E-03	1.56			
1977		140	6.95E-08	0.00	1.36E-06	0.00	1.58E-04	0.02	2.53E-03	0.35			
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1980		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1981		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990		3	0.00E+00	0.00	2.97E-13	0.00	1.59E-07	0.00	5.03E-05	0.00			
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
Total		3622	Total >	1.17	Total >	3.40	Total >	24.63	Total >	95.34			
Upper 95% Confidence Limits													
Manufacture Date		Number	1996		2000		2010		2020				
			Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958		583	1.57E-02	9.13	2.67E-02	15.57	7.30E-02	42.56	1.47E-01	85.50			
1959		553	1.35E-02	7.46	2.36E-02	13.03	6.71E-02	37.11	1.38E-01	76.40			
1960		553	1.15E-02	6.39	2.07E-02	11.44	6.15E-02	34.01	1.30E-01	71.83			
1961		442	9.81E-03	4.33	1.81E-02	7.98	5.62E-02	24.83	1.22E-01	53.87			
1962		255	8.26E-03	2.11	1.57E-02	3.99	5.11E-02	13.04	1.14E-01	29.10			
1963		10	6.90E-03	0.07	1.35E-02	0.13	4.64E-02	0.46	1.07E-01	1.07			
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968		45	2.39E-03	0.11	5.71E-03	0.26	2.67E-02	1.20	7.30E-02	3.28			
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971		26	1.08E-03	0.03	3.03E-03	0.08	1.81E-02	0.47	5.62E-02	1.46			
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973		340	5.81E-04	0.20	1.86E-03	0.63	1.35E-02	4.59	4.64E-02	15.76			
1974		173	4.12E-04	0.07	1.43E-03	0.25	1.15E-02	2.00	4.19E-02	7.25			
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976		499	1.92E-04	0.10	8.00E-04	0.40	8.26E-03	4.12	3.37E-02	16.84			
1977		140	1.25E-04	0.02	5.81E-04	0.08	6.90E-03	0.97	3.01E-02	4.21			
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1980		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1981		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990		3	9.54E-07	0.00	9.54E-07	0.00	1.92E-04	0.00	3.78E-03	0.01			
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
Total		3622	Total >	30.01	Total >	53.85	Total >	165.35	Total >	366.58			

Yard Choice	4
Row (1=bottom,2=top)	1
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	250
Yard Name	C-745-G yard bottom row cylinders (3622 cylinders)
Yard Lat Mean	1.021
Yard Lat St Dev	0.332
ThickN	17
alpha	0.95
Yard Mean	2.825 (mils)
Yard St Dev	0.379 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)									
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	9.82E-01	572.73	9.92E-01	578.32	9.99E-01	582.34	1.00E+00	582.90
1959	553	9.79E-01	541.16	9.90E-01	547.60	9.99E-01	552.24	1.00E+00	552.89
1960	553	9.74E-01	538.61	9.88E-01	546.42	9.98E-01	552.07	1.00E+00	552.86
1961	442	9.68E-01	428.03	9.86E-01	435.60	9.98E-01	441.10	1.00E+00	441.87
1962	255	9.62E-01	245.22	9.82E-01	250.51	9.98E-01	254.37	1.00E+00	254.91
1963	10	9.54E-01	9.54	9.79E-01	9.79	9.97E-01	9.97	1.00E+00	10.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	8.82E-01	39.69	9.44E-01	42.47	9.92E-01	44.64	9.99E-01	44.95
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	8.00E-01	20.81	9.02E-01	23.44	9.86E-01	25.62	9.98E-01	25.95
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	7.23E-01	245.78	8.59E-01	292.00	9.79E-01	332.72	9.97E-01	338.98
1974	173	6.76E-01	117.00	8.32E-01	143.90	9.74E-01	168.50	9.96E-01	172.37
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	5.67E-01	283.15	7.64E-01	381.32	9.62E-01	479.87	9.95E-01	496.30
1977	140	5.06E-01	70.85	7.23E-01	101.20	9.54E-01	133.50	9.93E-01	139.08
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	2.69E-04	0.00	2.74E-02	0.08	5.67E-01	1.70	9.18E-01	2.75
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	3112.56	Total >	3352.65	Total >	3578.64	Total >	3615.79
Upper 95% Confidence Limits									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	9.98E-01	581.57	9.99E-01	582.58	1.00E+00	582.98	1.00E+00	583.00
1959	553	9.97E-01	551.16	9.99E-01	552.46	1.00E+00	552.98	1.00E+00	553.00
1960	553	9.96E-01	550.51	9.99E-01	552.27	1.00E+00	552.97	1.00E+00	553.00
1961	442	9.94E-01	439.32	9.98E-01	441.20	1.00E+00	441.96	1.00E+00	442.00
1962	255	9.92E-01	252.91	9.98E-01	254.37	1.00E+00	254.97	1.00E+00	255.00
1963	10	9.89E-01	9.89	9.97E-01	9.97	1.00E+00	10.00	1.00E+00	10.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	9.55E-01	42.98	9.85E-01	44.34	9.99E-01	44.97	1.00E+00	45.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	9.03E-01	23.48	9.66E-01	25.11	9.98E-01	25.95	1.00E+00	26.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	8.45E-01	287.44	9.41E-01	320.10	9.97E-01	338.87	1.00E+00	339.95
1974	173	8.08E-01	139.80	9.24E-01	159.91	9.96E-01	172.22	1.00E+00	172.96
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	7.15E-01	356.98	8.77E-01	437.58	9.92E-01	494.92	1.00E+00	498.81
1977	140	6.61E-01	92.47	8.45E-01	118.36	9.89E-01	138.46	9.99E-01	139.93
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	9.12E-03	0.03	1.11E-01	0.33	7.15E-01	2.15	9.74E-01	2.92
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	3328.54	Total >	3498.59	Total >	3613.40	Total >	3621.56

Yard Choice	4
Row (1=bottom,2=top)	1
Initial Thickness (mils)	312.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-G yard bottom row cylinders (3622 cylinders)
Yard Ln Mean	1.021
Yard Ln SDev	0.332
The N	17
alpha	0.95
Yard Mean	2.925 (mils)
Yard SDev	0.979 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)													
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr.													
Manufacture Date	Number	Prob.	1996	#	Prob.	2000	#	Prob.	2010	#	Prob.	2020	#
1958	583	5.29E-04	0.31	1.48E-03	0.86	9.95E-03	5.80	3.61E-02	21.05				
1959	553	3.97E-04	0.22	1.16E-03	0.64	8.49E-03	4.70	3.24E-02	17.91				
1960	553	2.94E-04	0.16	9.05E-04	0.50	7.21E-03	3.99	2.89E-02	16.00				
1961	442	2.14E-04	0.09	6.97E-04	0.31	6.08E-03	2.69	2.57E-02	11.38				
1962	255	1.53E-04	0.04	5.29E-04	0.14	5.09E-03	1.30	2.28E-02	5.81				
1963	10	1.08E-04	0.00	3.97E-04	0.00	4.23E-03	0.04	2.01E-02	0.20				
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1968	45	1.36E-05	0.00	7.45E-05	0.00	1.48E-03	0.07	9.95E-03	0.45				
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1971	26	2.85E-06	0.00	2.16E-05	0.00	6.97E-04	0.02	6.08E-03	0.16				
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1973	340	8.40E-07	0.00	8.35E-06	0.00	3.97E-04	0.13	4.23E-03	1.44				
1974	173	4.27E-07	0.00	4.96E-06	0.00	2.94E-04	0.05	3.49E-03	0.60				
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1976	499	9.44E-08	0.00	1.53E-06	0.00	1.53E-04	0.08	2.31E-03	1.15				
1977	140	4.05E-08	0.00	8.40E-07	0.00	1.08E-04	0.02	1.86E-03	0.26				
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1990	3	0.00E+00	0.00	1.44E-13	0.00	9.44E-08	0.00	3.34E-05	0.00				
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
Total	3622	Total >	0.83	Total >	2.46	Total >	18.87	Total >	76.40				
Upper 95% Confidence Limits													
Manufacture Date	Number	Prob.	1996	#	Prob.	2000	#	Prob.	2010	#	Prob.	2020	#
1958	583	1.31E-02	7.61	2.26E-02	13.15	6.33E-02	36.93	1.30E-01	75.80				
1959	553	1.12E-02	6.20	1.98E-02	10.97	5.81E-02	32.13	1.22E-01	67.61				
1960	553	9.56E-03	5.29	1.74E-02	9.60	5.31E-02	29.37	1.15E-01	63.44				
1961	442	8.09E-03	3.57	1.51E-02	6.68	4.84E-02	21.39	1.07E-01	47.48				
1962	255	6.79E-03	1.73	1.31E-02	3.33	4.39E-02	11.20	1.00E-01	25.59				
1963	10	5.64E-03	0.06	1.12E-02	0.11	3.97E-02	0.40	9.35E-02	0.94				
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1968	45	1.92E-03	0.09	4.65E-03	0.21	2.26E-02	1.01	6.33E-02	2.85				
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1971	26	8.51E-04	0.02	2.44E-03	0.06	1.51E-02	0.39	4.84E-02	1.26				
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1973	340	4.53E-04	0.15	1.48E-03	0.50	1.12E-02	3.81	3.97E-02	13.51				
1974	173	3.19E-04	0.06	1.13E-03	0.20	9.56E-03	1.65	3.58E-02	6.19				
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1976	499	1.47E-04	0.07	6.27E-04	0.31	6.79E-03	3.39	2.87E-02	14.31				
1977	140	9.54E-05	0.01	4.53E-04	0.06	5.64E-03	0.79	2.55E-02	3.57				
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1990	3	9.54E-07	0.00	9.54E-07	0.00	1.47E-04	0.00	3.06E-03	0.01				
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00				
Total	3622	Total >	24.87	Total >	45.20	Total >	142.46	Total >	322.54				

Yard Choice	4
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	312.5 (mils)
Failure Level (mils)	250
Yard Name	C-745-G yard bottom row cylinders (3622 cylinders)
Yard LA Mean	1.021
Yard LA StDev	0.332
Thick	17
alpha	0.95
Yard Mean	2.925 (mils)
Yard StDev	0.979 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)									
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr									
		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	9.43E-01	549.73	9.70E-01	565.55	9.94E-01	579.64	9.99E-01	582.35
1959	553	9.33E-01	516.02	9.65E-01	533.53	9.93E-01	549.24	9.99E-01	552.27
1960	553	9.22E-01	509.72	9.59E-01	530.10	9.92E-01	548.56	9.98E-01	552.14
1961	442	9.09E-01	401.58	9.51E-01	420.51	9.91E-01	437.81	9.98E-01	441.19
1962	255	8.93E-01	227.80	9.43E-01	240.45	9.89E-01	252.15	9.98E-01	254.45
1963	10	8.76E-01	8.76	9.33E-01	9.33	9.87E-01	9.87	9.97E-01	9.97
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	7.45E-01	33.53	8.56E-01	38.51	9.70E-01	43.65	9.94E-01	44.74
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	6.24E-01	16.23	7.78E-01	20.22	9.51E-01	24.74	9.91E-01	25.75
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	5.26E-01	178.88	7.09E-01	240.91	9.33E-01	317.26	9.87E-01	335.52
1974	173	4.73E-01	81.77	6.88E-01	115.62	9.22E-01	159.46	9.84E-01	170.31
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	3.61E-01	180.09	5.77E-01	287.86	8.93E-01	445.77	9.78E-01	488.23
1977	140	3.05E-01	42.67	5.26E-01	73.66	8.76E-01	122.62	9.75E-01	136.44
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	3.34E-05	0.00	7.21E-03	0.02	3.61E-01	1.08	8.07E-01	2.42
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	2746.78	Total >	3076.26	Total >	3491.85	Total >	3595.80
Upper 95% Confidence Limits									
		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	9.85E-01	574.24	9.94E-01	579.74	1.00E+00	582.75	1.00E+00	582.98
1959	553	9.81E-01	542.42	9.91E-01	549.03	9.99E-01	552.69	1.00E+00	552.98
1960	553	9.76E-01	539.58	9.91E-01	547.91	9.99E-01	552.60	1.00E+00	552.97
1961	442	9.69E-01	428.44	9.88E-01	436.79	9.99E-01	441.59	1.00E+00	441.97
1962	255	9.61E-01	245.15	9.85E-01	251.17	9.99E-01	254.69	1.00E+00	254.98
1963	10	9.52E-01	9.52	9.81E-01	9.81	9.98E-01	9.98	1.00E+00	10.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	8.63E-01	38.81	9.40E-01	42.28	9.94E-01	44.75	1.00E+00	44.98
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	7.65E-01	19.88	8.87E-01	23.06	9.88E-01	25.69	9.99E-01	25.98
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	6.79E-01	230.74	8.34E-01	283.60	9.81E-01	333.50	9.98E-01	339.47
1974	173	6.30E-01	109.00	8.02E-01	138.67	9.76E-01	168.80	9.98E-01	172.65
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	5.24E-01	261.68	7.24E-01	361.11	9.61E-01	479.73	9.97E-01	497.32
1977	140	4.69E-01	65.64	6.79E-01	95.01	9.52E-01	133.22	9.96E-01	139.39
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	3.06E-03	0.01	5.31E-02	0.16	5.24E-01	1.57	9.08E-01	2.72
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	3065.10	Total >	3318.34	Total >	3581.58	Total >	3618.39

Yard Choice	4
Row (1=bottom,2=top)	1
Initial Thickness (mils)	329 (mils)
Failure Level (mils)	0
YardName	C-745-G yard bottom row cylinders (3622 cylinders)
YardLnMean	1.021
YardLnStDev	0.332
TheN	17
alpha	0.95
Yard Mean	2.925 (mils)
Yard StDev	0.979 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)									
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr.									
Manufacture Date	Number	1996 Prob.	1996 #	2000 Prob.	2000 #	2010 Prob.	2010 #	2020 Prob.	2020 #
1958	583	3.02E-04	0.18	8.31E-04	0.51	6.50E-03	3.79	2.54E-02	14.81
1959	553	2.24E-04	0.12	6.86E-04	0.38	5.51E-03	3.05	2.26E-02	12.52
1960	553	1.64E-04	0.09	5.29E-04	0.29	4.64E-03	2.56	2.01E-02	11.11
1961	442	1.18E-04	0.05	4.02E-04	0.18	3.87E-03	1.71	1.77E-02	7.44
1962	255	8.33E-05	0.02	3.02E-04	0.08	3.22E-03	0.82	1.56E-02	3.98
1963	10	5.78E-05	0.00	2.24E-04	0.00	2.65E-03	0.03	1.37E-02	0.14
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	6.79E-06	0.00	3.94E-05	0.00	8.81E-04	0.04	6.50E-03	0.29
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	1.35E-06	0.00	1.09E-05	0.00	4.02E-04	0.01	3.87E-03	0.10
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	3.83E-07	0.00	4.09E-06	0.00	2.24E-04	0.08	2.65E-03	0.90
1974	173	1.91E-07	0.00	2.39E-06	0.00	1.64E-04	0.03	2.16E-03	0.37
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	4.04E-08	0.00	7.34E-07	0.00	8.33E-05	0.04	1.41E-03	0.70
1977	140	1.70E-08	0.00	3.83E-07	0.00	5.78E-05	0.01	1.12E-03	0.16
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	0.00E+00	0.00	4.49E-14	0.00	4.04E-08	0.00	1.72E-05	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	0.46	Total >	1.45	Total >	12.16	Total >	52.93
Upper 95% Confidence Limits									
Manufacture Date	Number	1996 Prob.	1996 #	2000 Prob.	2000 #	2010 Prob.	2010 #	2020 Prob.	2020 #
1958	583	9.71E-03	5.66	1.71E-02	9.98	5.02E-02	29.27	1.07E-01	62.17
1959	553	8.29E-03	4.58	1.50E-02	8.29	4.59E-02	25.36	9.99E-02	55.27
1960	553	7.03E-03	3.89	1.30E-02	7.22	4.18E-02	23.09	9.35E-02	51.70
1961	442	5.91E-03	2.61	1.13E-02	4.99	3.79E-02	16.75	8.73E-02	38.57
1962	255	4.93E-03	1.26	9.71E-03	2.48	3.43E-02	8.74	8.13E-02	20.72
1963	10	4.07E-03	0.04	8.29E-03	0.08	3.09E-02	0.31	7.55E-02	0.75
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	1.33E-03	0.06	3.33E-03	0.15	1.71E-02	0.77	5.02E-02	2.26
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	5.79E-04	0.02	1.71E-03	0.04	1.13E-02	0.29	3.79E-02	0.99
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	3.02E-04	0.10	1.03E-03	0.35	8.29E-03	2.82	3.09E-02	10.49
1974	173	2.11E-04	0.04	7.77E-04	0.13	7.03E-03	1.22	2.77E-02	4.79
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	9.44E-05	0.05	4.22E-04	0.21	4.93E-03	2.46	2.20E-02	10.96
1977	140	6.10E-05	0.01	3.02E-04	0.04	4.07E-03	0.57	1.94E-02	2.72
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	9.54E-07	0.00	9.54E-07	0.00	9.44E-05	0.00	2.16E-03	0.01
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	18.31	Total >	33.96	Total >	111.65	Total >	261.39

Yard Choice 4
Row (1=bottom,2=top) 1
InitialThickness (mils) 329 (mils)
FailureLevel (mils) 250
YardName C-745-G yard bottom row cylinders (3622 cylinders)
YardLnMean 1.021
YardLnSDDev 0.332
TheN 17
alpha 0.95
Yard Mean 2.925 (mils)
Yard SDDev 0.879 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	8.09E-01	471.50	8.80E-01	513.06	9.66E-01	562.93	9.91E-01	577.53
1959	553	7.86E-01	434.70	8.65E-01	478.27	9.61E-01	531.36	9.89E-01	547.08
1960	553	7.61E-01	420.95	8.48E-01	468.96	9.56E-01	528.41	9.88E-01	546.26
1961	442	7.34E-01	324.47	8.29E-01	366.58	9.50E-01	419.68	9.86E-01	435.86
1962	255	7.05E-01	179.68	8.09E-01	206.23	9.43E-01	240.39	9.84E-01	250.96
1963	10	6.73E-01	6.73	7.86E-01	7.86	9.35E-01	9.35	9.82E-01	9.82
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	4.81E-01	21.64	6.39E-01	28.74	8.80E-01	39.60	9.66E-01	43.45
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	3.48E-01	9.06	5.23E-01	13.60	8.29E-01	21.56	9.50E-01	24.69
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	2.61E-01	88.65	4.37E-01	148.73	7.86E-01	267.26	9.35E-01	317.91
1974	173	2.19E-01	37.91	3.93E-01	68.00	7.61E-01	131.69	9.26E-01	160.27
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	1.44E-01	71.84	3.04E-01	151.73	7.05E-01	351.62	9.06E-01	452.01
1977	140	1.12E-01	15.64	2.61E-01	36.50	6.73E-01	94.20	8.94E-01	125.11
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	1.34E-06	0.00	8.07E-04	0.00	1.44E-01	0.43	5.64E-01	1.69
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	2082.77	Total >	2488.26	Total >	3198.48	Total >	3492.63

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	9.09E-01	529.87	9.54E-01	556.18	9.93E-01	578.96	9.99E-01	582.46
1959	553	8.93E-01	493.78	9.47E-01	522.66	9.92E-01	548.33	9.99E-01	552.38
1960	553	8.75E-01	483.72	9.37E-01	516.94	9.90E-01	547.32	9.99E-01	552.24
1961	442	8.54E-01	377.53	9.23E-01	407.86	9.88E-01	436.49	9.98E-01	441.25
1962	255	8.31E-01	211.91	9.09E-01	231.76	9.85E-01	251.14	9.98E-01	254.47
1963	10	8.05E-01	8.05	8.93E-01	8.93	9.82E-01	9.82	9.97E-01	9.97
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	6.38E-01	28.69	7.77E-01	34.96	9.54E-01	42.93	9.93E-01	44.69
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	5.12E-01	13.32	6.70E-01	17.57	9.23E-01	23.99	9.88E-01	25.68
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	4.24E-01	144.05	5.97E-01	203.09	8.93E-01	303.59	9.82E-01	333.78
1974	173	3.79E-01	65.60	5.55E-01	96.09	8.75E-01	151.33	9.78E-01	169.17
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	2.92E-01	145.84	4.68E-01	233.61	8.31E-01	414.67	9.68E-01	483.00
1977	140	2.51E-01	35.11	4.24E-01	59.31	8.05E-01	112.74	9.62E-01	134.62
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	5.76E-04	0.00	1.63E-02	0.05	2.92E-01	0.88	7.12E-01	2.14
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	2537.48	Total >	2889.02	Total >	3422.19	Total >	3585.84

Yard Choice 4
Row (1=bottom,2=top) 1
Initial Thickness (mils) 345.5 (mils)
Failure Level (mils) 0
Yard Name C-745-G yard bottom row cylinders (3622 cylinders)
Yard Ln Mean 1.021
Yard Ln StDev 0.332
The N 17
alpha 0.95
Yard Mean 2.925 (mils)
Yard StDev 0.979 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)

Predicted number of cylinders with breaches during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr.

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	1.74E-04	0.10	5.25E-04	0.31	4.25E-03	2.48	1.78E-02	10.40
1959	553	1.27E-04	0.07	4.07E-04	0.23	3.58E-03	1.98	1.58E-02	8.73
1960	553	9.19E-05	0.05	3.10E-04	0.17	2.98E-03	1.65	1.39E-02	7.70
1961	442	6.53E-05	0.03	2.34E-04	0.10	2.47E-03	1.09	1.22E-02	5.40
1962	255	4.57E-05	0.01	1.74E-04	0.04	2.04E-03	0.52	1.07E-02	2.72
1963	10	3.13E-05	0.00	1.27E-04	0.00	1.66E-03	0.02	9.28E-03	0.69
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	3.43E-06	0.00	2.11E-05	0.00	5.28E-04	0.02	4.25E-03	0.19
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	6.50E-07	0.00	5.61E-06	0.00	2.34E-04	0.01	2.47E-03	0.06
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	1.78E-07	0.00	2.03E-06	0.00	1.27E-04	0.04	1.66E-03	0.57
1974	173	8.69E-08	0.00	1.17E-06	0.00	9.19E-05	0.02	1.35E-03	0.23
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	1.77E-08	0.00	3.47E-07	0.00	4.57E-05	0.02	8.59E-04	0.43
1977	140	7.25E-09	0.00	1.78E-07	0.00	3.13E-05	0.00	6.77E-04	0.09
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	0.00E+00	0.00	1.45E-14	0.00	1.77E-08	0.00	8.93E-06	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	0.26	Total >	0.86	Total >	7.85	Total >	36.62

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	7.25E-03	4.23	1.50E-02	7.60	3.99E-02	23.24	8.75E-02	51.01
1959	553	6.16E-03	3.40	1.14E-02	6.28	3.63E-02	20.06	8.18E-02	45.22
1960	553	5.19E-03	2.87	9.84E-03	5.44	3.29E-02	18.20	7.62E-02	42.17
1961	442	4.34E-03	1.92	8.48E-03	3.75	2.97E-02	13.15	7.09E-02	31.36
1962	255	3.60E-03	0.92	7.23E-03	1.85	2.68E-02	6.83	6.59E-02	16.79
1963	10	2.96E-03	0.03	6.16E-03	0.06	2.40E-02	0.24	6.10E-02	0.61
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	9.36E-04	0.04	2.40E-03	0.11	1.30E-02	0.59	3.99E-02	1.79
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	3.97E-04	0.01	1.21E-03	0.03	8.48E-03	0.22	2.97E-02	0.77
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	2.03E-04	0.07	7.15E-04	0.24	6.16E-03	2.09	2.40E-02	8.17
1974	173	1.40E-04	0.02	5.37E-04	0.09	5.19E-03	0.90	2.15E-02	3.71
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	6.20E-05	0.03	2.87E-04	0.14	3.60E-03	1.80	1.69E-02	8.43
1977	140	3.91E-05	0.01	2.03E-04	0.03	2.96E-03	0.41	1.49E-02	2.08
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	9.54E-07	0.00	9.54E-07	0.00	6.20E-05	0.00	1.54E-03	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	13.55	Total >	25.63	Total >	87.73	Total >	212.12

Yard Choice 4
 Row (1=bottom,2=top) 1
 Initial Thickness (mils) 345.5 (mils)
 Failure Level (mils) 250
 Yard Name C-745-G yard bottom row cylinders (3622 cylinders)
 Yard Lat Mean 1.021
 Yard Lat StDev 0.332
 The N 17
 alpha 0.95
 Yard Mean 2.925 (mils)
 Yard StDev 0.979 (mils)

C-745-G yard bottom row cylinders (3622 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-G yard bottom row cylinders (3622 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 2.93 and 0.98 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	6.18E-01	360.51	7.27E-01	423.70	8.94E-01	521.11	9.62E-01	561.01
1959	553	5.87E-01	324.81	7.02E-01	388.25	8.83E-01	488.14	9.58E-01	529.81
1960	553	5.55E-01	306.87	6.76E-01	373.70	8.71E-01	481.41	9.53E-01	527.24
1961	442	5.21E-01	230.37	6.48E-01	286.35	8.57E-01	378.90	9.48E-01	419.13
1962	255	4.86E-01	124.01	6.18E-01	157.68	8.43E-01	214.90	9.43E-01	240.35
1963	10	4.51E-01	4.51	5.87E-01	5.87	8.27E-01	8.27	9.36E-01	9.36
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	2.68E-01	12.04	4.14E-01	18.63	7.27E-01	32.70	8.94E-01	40.22
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	1.68E-01	4.37	3.04E-01	7.89	6.48E-01	16.84	8.57E-01	22.29
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	1.13E-01	38.26	2.33E-01	79.16	5.87E-01	199.70	8.27E-01	281.17
1974	173	8.89E-02	15.39	1.99E-01	34.51	5.55E-01	96.00	8.10E-01	140.11
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	5.10E-02	25.47	1.39E-01	69.36	4.86E-01	242.67	7.71E-01	384.91
1977	140	3.68E-02	5.15	1.13E-01	15.75	4.51E-01	63.07	7.50E-01	104.98
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	6.98E-08	0.00	9.75E-05	0.00	5.10E-02	0.15	3.40E-01	1.02
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	1451.75	Total >	1860.86	Total >	2743.88	Total >	3261.61

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	583	7.60E-01	442.83	8.48E-01	494.64	9.62E-01	560.64	9.92E-01	578.35
1959	553	7.33E-01	405.25	8.29E-01	458.41	9.50E-01	528.40	9.91E-01	547.81
1960	553	7.04E-01	389.50	8.08E-01	446.63	9.49E-01	524.52	9.89E-01	546.90
1961	442	6.74E-01	298.00	7.85E-01	346.76	9.41E-01	415.71	9.87E-01	436.28
1962	255	6.43E-01	163.85	7.60E-01	193.69	9.31E-01	237.52	9.85E-01	251.13
1963	10	6.10E-01	6.10	7.33E-01	7.33	9.21E-01	9.21	9.82E-01	9.82
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	45	4.31E-01	19.39	5.75E-01	25.89	8.48E-01	38.18	9.62E-01	43.27
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	26	3.21E-01	8.36	4.68E-01	12.16	7.85E-01	20.40	9.41E-01	24.45
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	340	2.52E-01	85.63	3.94E-01	133.98	7.33E-01	249.16	9.21E-01	313.21
1974	173	2.19E-01	37.89	3.57E-01	61.84	7.04E-01	121.85	9.10E-01	157.37
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	499	1.58E-01	79.09	2.86E-01	142.76	6.43E-01	320.63	8.82E-01	440.24
1977	140	1.31E-01	18.39	2.52E-01	35.26	6.10E-01	85.34	8.66E-01	121.27
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1981	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	3	1.26E-04	0.00	5.35E-03	0.02	1.58E-01	0.48	5.04E-01	1.51
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	3622	Total >	1954.27	Total >	2359.38	Total >	3112.04	Total >	3471.61

Yard Choice	5
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-K/L yards bottom row cylinders (4390 cylinders)
Yard In Mean	0.870
Yard In StDev	0.351
ThcN	25
alpha	0.95
Yard Mean	2.068 (mils)
Yard StDev	0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)		Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards bottom row cylinders (4390 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 2.07 and 0.68 mils/yr.							
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	3.31E-05	0.00	1.03E-04	0.01	9.54E-04	0.11	4.61E-03	0.55
1959	51	2.32E-05	0.00	7.83E-05	0.00	7.91E-04	0.04	4.03E-03	0.21
1960	69	1.66E-05	0.00	5.87E-05	0.00	6.51E-04	0.04	3.50E-03	0.24
1961	12	1.16E-05	0.00	4.38E-05	0.00	5.32E-04	0.01	3.03E-03	0.04
1962	21	8.05E-06	0.00	3.21E-05	0.00	4.31E-04	0.01	2.61E-03	0.05
1963	1	5.46E-06	0.00	2.32E-05	0.00	3.47E-04	0.00	2.24E-03	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	5.70E-07	0.00	3.63E-06	0.00	1.03E-04	0.00	9.54E-04	0.01
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	1.06E-07	0.00	9.40E-07	0.00	4.38E-05	0.00	5.32E-04	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.41E-08	0.00	1.92E-07	0.00	1.66E-05	0.00	2.77E-04	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	2.89E-09	0.00	5.66E-08	0.00	8.05E-06	0.01	1.72E-04	0.11
1977	959	1.19E-09	0.00	2.89E-08	0.00	5.46E-06	0.01	1.34E-04	0.13
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	1.63E-10	0.00	6.57E-09	0.00	2.37E-06	0.00	7.83E-05	0.02
1980	704	5.31E-11	0.00	2.89E-09	0.00	1.51E-06	0.00	5.89E-05	0.04
1981	36	1.55E-11	0.00	1.19E-09	0.00	9.40E-07	0.00	4.38E-05	0.00
1982	434	4.02E-12	0.00	4.60E-10	0.00	5.70E-07	0.00	3.21E-05	0.01
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	1.71E-13	0.00	5.31E-11	0.00	1.92E-07	0.00	1.66E-05	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	3.22E-15	0.00	4.02E-12	0.00	5.66E-08	0.00	8.05E-06	0.00
1987	352	3.33E-16	0.00	9.03E-13	0.00	2.89E-08	0.00	5.46E-06	0.00
1988	278	0.00E+00	0.00	1.71E-13	0.00	1.41E-08	0.00	3.63E-06	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	0.00E+00	0.00	3.22E-15	0.00	2.89E-09	0.00	1.51E-06	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	0.00E+00	0.00	0.00E+00	0.00	4.60E-10	0.00	5.70E-07	0.00
Total	4390	Total >	0.01	Total >	0.02	Total >	0.23	Total >	1.43

Upper 95% Confidence Limits									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	1.45E-03	0.17	2.91E-03	0.35	1.12E-02	1.34	2.93E-02	3.51
1959	51	1.20E-03	0.06	2.47E-03	0.13	9.97E-03	0.51	2.69E-02	1.37
1960	69	9.78E-04	0.07	2.09E-03	0.14	8.86E-03	0.61	2.47E-02	1.70
1961	12	7.92E-04	0.01	1.75E-03	0.02	7.84E-03	0.09	2.26E-02	0.27
1962	21	6.36E-04	0.01	1.45E-03	0.03	6.91E-03	0.15	2.06E-02	0.43
1963	1	5.04E-04	0.00	1.20E-03	0.00	6.06E-03	0.01	1.88E-02	0.02
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	1.32E-04	0.00	3.96E-04	0.00	2.91E-03	0.03	1.12E-02	0.12
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	4.86E-05	0.00	1.77E-04	0.00	1.75E-03	0.00	7.84E-03	0.02
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.43E-05	0.00	6.87E-05	0.00	9.78E-04	0.01	5.29E-03	0.06
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	5.72E-06	0.00	3.34E-05	0.02	6.36E-04	0.40	3.97E-03	2.52
1977	959	2.86E-06	0.00	2.19E-05	0.02	5.04E-04	0.48	3.41E-03	3.27
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	9.54E-07	0.00	8.58E-06	0.00	3.07E-04	0.08	2.47E-03	0.63
1980	704	9.54E-07	0.00	5.72E-06	0.00	2.35E-04	0.17	2.09E-03	1.47
1981	36	9.54E-07	0.00	2.86E-06	0.00	1.77E-04	0.01	1.75E-03	0.06
1982	434	9.54E-07	0.00	1.91E-06	0.00	1.32E-04	0.06	1.45E-03	0.63
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	9.54E-07	0.00	9.54E-07	0.00	6.87E-05	0.00	9.78E-04	0.02
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	9.54E-07	0.00	9.54E-07	0.00	3.34E-05	0.01	6.36E-04	0.12
1987	352	9.54E-07	0.00	9.54E-07	0.00	2.19E-05	0.01	5.04E-04	0.18
1988	278	9.54E-07	0.00	9.54E-07	0.00	1.43E-05	0.00	3.96E-04	0.11
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.54E-07	0.00	9.54E-07	0.00	5.72E-06	0.00	2.35E-04	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	9.54E-07	0.00	1.91E-06	0.00	1.32E-04	0.03
Total	4390	Total >	0.34	Total >	0.73	Total >	3.97	Total >	16.55

Yard Choice 5
Row (1=bottom,2=top) 1
Initial Thickness (mils) 302.5 (mils)
Failure Level (mils) 250
Yard Name C-745-K/L yards bottom row cylinders (4390 cylinders)
Yard Lab Mean 0.670
Yard Lab Std Dev 0.351
Thickness 25
alpha 0.95
Yard Mean 2.068 (mils)
Yard Std Dev 0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards bottom row cylinder (4390 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 2.07 and 0.68 mils

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	8.38E-01	100.60	8.98E-01	107.80	9.70E-01	116.39	9.91E-01	118.96
1959	51	8.19E-01	41.77	8.86E-01	45.17	9.66E-01	49.27	9.90E-01	50.50
1960	69	7.98E-01	55.04	8.71E-01	60.13	9.62E-01	66.34	9.89E-01	68.24
1961	12	7.74E-01	9.29	8.56E-01	10.27	9.56E-01	11.48	9.87E-01	11.85
1962	21	7.49E-01	15.73	8.38E-01	17.60	9.51E-01	19.97	9.86E-01	20.70
1963	1	7.21E-01	0.72	8.19E-01	0.82	9.44E-01	0.94	9.84E-01	0.98
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	5.47E-01	6.02	6.91E-01	7.60	8.98E-01	9.88	9.70E-01	10.67
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	4.19E-01	0.84	5.86E-01	1.17	8.56E-01	1.71	9.56E-01	1.91
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	2.85E-01	3.14	4.63E-01	5.09	7.98E-01	8.78	9.37E-01	10.31
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	2.01E-01	127.41	3.74E-01	237.70	7.49E-01	475.53	9.20E-01	584.17
1977	959	1.62E-01	155.59	3.29E-01	315.91	7.21E-01	691.48	9.10E-01	872.46
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	9.65E-02	24.41	2.42E-01	61.18	6.58E-01	166.57	8.86E-01	224.07
1980	704	7.02E-02	49.41	2.01E-01	141.26	6.23E-01	438.54	8.71E-01	613.53
1981	36	4.87E-02	1.75	1.62E-01	5.84	5.86E-01	21.11	8.56E-01	30.81
1982	434	3.18E-02	13.82	1.27E-01	55.25	5.47E-01	237.44	8.38E-01	363.82
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	1.09E-02	0.23	7.02E-02	1.47	4.63E-01	9.73	7.98E-01	16.75
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	2.46E-03	0.46	3.18E-02	5.95	3.74E-01	70.00	7.49E-01	140.04
1987	352	9.29E-04	0.33	1.94E-02	6.84	3.29E-01	115.95	7.21E-01	253.81
1988	278	2.83E-04	0.08	1.09E-02	3.04	2.85E-01	79.23	6.91E-01	192.07
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.56E-06	0.00	2.46E-03	0.00	2.01E-01	0.40	6.23E-01	1.25
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	2.99E-08	0.00	2.83E-04	0.07	1.27E-01	29.41	5.47E-01	126.38
Total	4390	Total >	606.63	Total >	1090.18	Total >	2620.54	Total >	3713.26

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	9.17E-01	109.99	9.56E-01	114.74	9.92E-01	119.07	9.99E-01	119.85
1959	51	9.03E-01	46.04	9.48E-01	48.37	9.91E-01	50.53	9.98E-01	50.92
1960	69	8.87E-01	61.19	9.39E-01	64.81	9.89E-01	68.24	9.98E-01	68.87
1961	12	8.69E-01	10.43	9.29E-01	11.84	9.87E-01	11.84	9.98E-01	11.97
1962	21	8.48E-01	17.82	9.17E-01	19.25	9.84E-01	20.67	9.97E-01	20.94
1963	1	8.26E-01	0.83	9.03E-01	0.90	9.81E-01	0.98	9.97E-01	1.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	6.73E-01	7.40	8.00E-01	8.80	9.56E-01	10.52	9.92E-01	10.91
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	5.52E-01	1.10	7.08E-01	1.42	9.29E-01	1.86	9.87E-01	1.97
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	4.18E-01	4.60	5.94E-01	6.53	8.87E-01	9.75	9.78E-01	10.76
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	3.27E-01	207.71	5.08E-01	322.66	8.48E-01	538.77	9.69E-01	615.11
1977	959	2.83E-01	271.33	4.63E-01	444.31	8.26E-01	791.84	9.63E-01	923.44
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	2.00E-01	50.59	3.72E-01	94.19	7.72E-01	195.42	9.48E-01	239.93
1980	704	1.62E-01	114.29	3.27E-01	230.28	7.42E-01	522.20	9.39E-01	661.23
1981	36	1.28E-01	4.61	2.83E-01	10.19	7.08E-01	25.51	9.29E-01	33.43
1982	434	9.77E-02	42.40	2.40E-01	104.31	6.73E-01	291.93	9.17E-01	397.80
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	4.99E-02	1.05	1.62E-01	3.41	5.94E-01	12.48	8.87E-01	18.62
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	1.99E-02	3.72	9.77E-02	18.27	5.08E-01	95.02	8.48E-01	158.66
1987	352	1.10E-02	3.87	7.16E-02	25.19	4.63E-01	163.08	8.26E-01	290.64
1988	278	5.36E-03	1.49	4.99E-02	13.87	4.18E-01	116.16	8.00E-01	222.50
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	7.22E-04	0.00	1.99E-02	0.04	3.27E-01	0.65	7.42E-01	1.48
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	2.29E-05	0.01	5.36E-03	1.24	2.40E-01	55.52	6.73E-01	155.38
Total	4390	Total >	960.46	Total >	1543.92	Total >	3102.04	Total >	4015.45

Yard Choice	5
Row (1=bottom,2=top)	1
Initial Thickness (mils)	312.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-K/L yards bottom row cylinders (4390 cylinders)
Yard In Mean	0.670
Yard In StDev	0.351
The N	25
alpha	0.95
Yard Mean	2.068 (mils)
Yard StDev	0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)									
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards bottom row cylinders (4390 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 2.07 and 0.68 mils/yr.									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	2.16E-05	0.00	7.11E-05	0.01	6.95E-04	0.08	3.51E-03	0.42
1959	51	1.56E-05	0.00	5.38E-05	0.00	5.73E-04	0.03	3.05E-03	0.16
1960	69	1.10E-05	0.00	4.02E-05	0.00	4.69E-04	0.03	2.64E-03	0.18
1961	12	7.69E-06	0.00	2.97E-05	0.00	3.82E-04	0.00	2.28E-03	0.03
1962	21	5.27E-06	0.00	2.16E-05	0.00	3.08E-04	0.01	1.95E-03	0.04
1963	1	3.55E-06	0.00	1.56E-05	0.00	2.47E-04	0.00	1.67E-03	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	3.56E-07	0.00	2.34E-06	0.00	7.11E-05	0.00	6.95E-04	0.01
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	6.44E-08	0.00	5.92E-07	0.00	2.97E-05	0.00	3.82E-04	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	8.23E-09	0.00	1.18E-07	0.00	1.10E-05	0.00	1.96E-04	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	1.65E-09	0.00	3.39E-08	0.00	5.27E-06	0.00	1.20E-04	0.08
1977	959	6.74E-10	0.00	1.72E-08	0.00	3.55E-06	0.00	9.29E-05	0.09
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	8.97E-11	0.00	3.81E-09	0.00	1.52E-06	0.00	5.38E-05	0.01
1980	704	2.87E-11	0.00	1.65E-09	0.00	9.59E-07	0.00	4.02E-05	0.03
1981	36	8.25E-12	0.00	6.74E-10	0.00	5.92E-07	0.00	2.97E-05	0.00
1982	434	2.10E-12	0.00	2.56E-10	0.00	3.56E-07	0.00	2.16E-05	0.01
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	8.60E-14	0.00	2.87E-11	0.00	1.18E-07	0.00	1.10E-05	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	1.55E-15	0.00	2.10E-12	0.00	3.39E-08	0.00	5.27E-06	0.00
1987	352	1.11E-16	0.00	4.63E-13	0.00	1.72E-08	0.00	3.55E-06	0.00
1988	278	0.00E+00	0.00	8.60E-14	0.00	8.29E-09	0.00	2.34E-06	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	0.00E+00	0.00	1.55E-15	0.00	1.65E-09	0.00	9.59E-07	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	0.00E+00	0.00	0.00E+00	0.00	2.56E-10	0.00	3.56E-07	0.00
Total	4390	Total >	0.00	Total >	0.01	Total >	0.17	Total >	1.06
Upper 95% Confidence Limits									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	1.15E-03	0.14	2.34E-03	0.28	9.22E-03	1.11	2.47E-02	2.97
1959	51	9.42E-04	0.05	1.97E-03	0.10	8.20E-03	0.42	2.27E-02	1.16
1960	69	7.66E-04	0.05	1.66E-03	0.11	7.27E-03	0.50	2.08E-02	1.43
1961	12	6.19E-04	0.01	1.38E-03	0.02	6.42E-03	0.08	1.90E-02	0.23
1962	21	4.94E-04	0.01	1.15E-03	0.02	5.64E-03	0.12	1.73E-02	0.36
1963	1	3.91E-04	0.00	9.42E-04	0.00	4.93E-03	0.00	1.57E-02	0.02
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	9.92E-05	0.00	3.05E-04	0.00	2.34E-03	0.03	9.22E-03	0.10
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	3.62E-05	0.00	1.34E-04	0.00	1.38E-03	0.00	6.42E-03	0.01
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.05E-05	0.00	5.15E-05	0.00	7.66E-04	0.01	4.29E-03	0.05
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	3.81E-06	0.00	2.48E-05	0.02	4.94E-04	0.31	3.20E-03	2.03
1977	959	1.91E-06	0.00	1.62E-05	0.02	3.91E-04	0.37	2.74E-03	2.63
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	9.54E-07	0.00	6.68E-06	0.00	2.36E-04	0.06	1.97E-03	0.50
1980	704	9.54E-07	0.00	3.81E-06	0.00	1.79E-04	0.13	1.66E-03	1.17
1981	36	9.54E-07	0.00	1.91E-06	0.00	1.34E-04	0.00	1.38E-03	0.05
1982	434	9.54E-07	0.00	9.54E-07	0.00	9.92E-05	0.04	1.15E-03	0.50
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	9.54E-07	0.00	9.54E-07	0.00	5.15E-05	0.00	7.66E-04	0.02
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	9.54E-07	0.00	9.54E-07	0.00	2.48E-05	0.00	4.94E-04	0.09
1987	352	9.54E-07	0.00	9.54E-07	0.00	1.62E-05	0.01	3.91E-04	0.14
1988	278	9.54E-07	0.00	9.54E-07	0.00	1.05E-05	0.00	3.05E-04	0.08
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.54E-07	0.00	9.54E-07	0.00	3.81E-06	0.00	1.79E-04	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.92E-05	0.02
Total	4390	Total >	0.26	Total >	0.58	Total >	3.20	Total >	13.56

Yard Choice 5
 Row (1=bottom,2=top) 1
 InitialThickness (mils) 312.5 (mils)
 FailureLevel (mils) 250
 YardName C-745-K/L yards bottom row cylinders (4390 cylinders)
 YardLnMean 0.670
 YardLnSDDev 0.351
 TheN 25
 alpha 0.95
 Yard Mean 2.068 (mils)
 Yard STDDev 0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards bottom row cylinder (4390 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 2.07 and 0.68 mils

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	6.88E-01	82.60	7.81E-01	93.74	9.17E-01	110.02	9.70E-01	116.43
1959	51	6.61E-01	33.71	7.60E-01	38.78	9.08E-01	46.31	9.67E-01	49.32
1960	69	6.32E-01	43.61	7.38E-01	50.92	8.98E-01	61.99	9.63E-01	66.47
1961	12	6.01E-01	7.22	7.14E-01	8.57	8.88E-01	10.65	9.59E-01	11.51
1962	21	5.69E-01	11.96	6.88E-01	14.46	8.76E-01	18.40	9.55E-01	20.05
1963	1	5.36E-01	0.54	6.61E-01	0.66	8.64E-01	0.86	9.50E-01	0.95
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	3.53E-01	3.88	5.01E-01	5.51	7.81E-01	8.59	9.17E-01	10.08
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	2.42E-01	0.48	3.90E-01	0.78	7.14E-01	1.43	8.88E-01	1.78
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.44E-01	1.58	2.78E-01	3.06	6.32E-01	6.95	8.50E-01	9.35
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	9.09E-02	57.69	2.07E-01	131.49	5.69E-01	361.53	8.18E-01	519.55
1977	959	6.92E-02	66.40	1.74E-01	167.04	5.36E-01	513.78	8.00E-01	767.58
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	3.61E-02	9.13	1.16E-01	29.23	4.65E-01	117.61	7.60E-01	192.37
1980	704	2.44E-02	17.17	9.09E-02	63.96	4.28E-01	301.29	7.38E-01	519.56
1981	36	1.56E-02	0.56	6.92E-02	2.49	3.90E-01	14.06	7.14E-01	25.70
1982	434	9.37E-03	4.07	5.10E-02	22.13	3.53E-01	153.09	6.88E-01	298.75
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	2.64E-03	0.06	2.44E-02	0.51	2.78E-01	5.84	6.32E-01	13.27
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	4.69E-04	0.09	9.37E-03	1.75	2.07E-01	38.72	5.69E-01	106.47
1987	352	1.54E-04	0.05	5.21E-03	1.83	1.74E-01	61.31	5.36E-01	188.58
1988	278	4.02E-05	0.01	2.64E-03	0.73	1.44E-01	39.92	5.01E-01	139.24
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.59E-07	0.00	4.69E-04	0.00	9.09E-02	0.18	4.28E-01	0.86
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	1.65E-09	0.00	4.02E-05	0.01	5.10E-02	11.78	3.53E-01	81.49
Total	4390	Total >	340.80	Total >	637.70	Total >	1884.31	Total >	3139.37

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	7.98E-01	95.79	8.74E-01	104.89	9.67E-01	116.03	9.92E-01	119.08
1959	51	7.75E-01	39.51	8.58E-01	43.74	9.62E-01	49.06	9.91E-01	50.55
1960	69	7.49E-01	51.71	8.40E-01	57.94	9.56E-01	65.98	9.90E-01	68.29
1961	12	7.22E-01	8.67	8.20E-01	9.84	9.50E-01	11.40	9.88E-01	11.86
1962	21	6.93E-01	14.55	7.98E-01	16.76	9.42E-01	19.79	9.86E-01	20.71
1963	1	6.62E-01	0.66	7.75E-01	0.77	9.34E-01	0.93	9.84E-01	0.98
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	4.87E-01	5.35	6.30E-01	6.93	8.74E-01	9.61	9.67E-01	10.64
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	3.72E-01	0.74	5.24E-01	1.05	8.20E-01	1.64	9.50E-01	1.90
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	2.61E-01	2.87	4.11E-01	4.52	7.49E-01	8.24	9.25E-01	10.17
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	1.92E-01	122.04	3.34E-01	212.27	6.93E-01	440.07	9.02E-01	572.82
1977	959	1.61E-01	154.31	2.97E-01	284.75	6.62E-01	635.04	8.89E-01	852.37
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	1.06E-01	26.77	2.26E-01	57.06	5.96E-01	150.72	8.58E-01	217.00
1980	704	8.25E-02	58.09	1.92E-01	135.30	5.60E-01	394.55	8.40E-01	591.12
1981	36	6.23E-02	2.24	1.61E-01	5.79	5.24E-01	18.86	8.20E-01	29.51
1982	434	4.54E-02	19.68	1.32E-01	57.29	4.87E-01	211.24	7.98E-01	346.43
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	2.08E-02	0.44	8.25E-02	1.73	4.11E-01	8.62	7.49E-01	15.74
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	7.27E-03	1.36	4.54E-02	8.48	3.34E-01	62.51	6.93E-01	129.59
1987	352	3.72E-03	1.31	3.15E-02	11.10	2.97E-01	104.52	6.62E-01	233.09
1988	278	1.66E-03	0.46	2.08E-02	5.78	2.61E-01	72.43	6.30E-01	175.06
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	1.79E-04	0.00	7.27E-03	0.01	1.92E-01	0.38	5.60E-01	1.12
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	3.81E-06	0.00	1.66E-03	0.38	1.32E-01	30.49	4.87E-01	112.43
Total	4390	Total >	606.55	Total >	1026.39	Total >	2412.12	Total >	3570.45

Yard Choice 5
 Row (1=bottom,2=top) 1
 InitialThickness (mils) 329 (mils)
 FailureLevel (mils) 0
 YardName C-745-K/L yards bottom row cylinders (4390 cylinders)
 YardInMean 0.670
 YardInSDDev 0.351
 TheN 25
 alpha 0.95
 Yard Mean 2.068 (mils)
 Yard SDDev 0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)

Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards bottom row cylinders (4390 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 2.07 and 0.68 mils/yr.

Manufacture Date	Number	1996	2000	2010	2020
		Prob. #	Prob. #	Prob. #	Prob. #
1958	120	1.14E-05 0.00	3.89E-05 0.00	4.14E-04 0.05	2.24E-03 0.27
1959	51	8.11E-06 0.00	2.92E-05 0.00	3.39E-04 0.02	1.93E-03 0.10
1960	69	5.68E-06 0.00	2.16E-05 0.00	2.75E-04 0.02	1.66E-03 0.11
1961	12	3.92E-06 0.00	1.58E-05 0.00	2.22E-04 0.00	1.42E-03 0.02
1962	21	2.65E-06 0.00	1.14E-05 0.00	1.78E-04 0.00	1.21E-03 0.03
1963	1	1.77E-06 0.00	8.11E-06 0.00	1.41E-04 0.00	1.03E-03 0.00
1964	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1965	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1966	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1967	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1968	11	1.66E-07 0.00	1.15E-06 0.00	3.89E-05 0.00	4.14E-04 0.00
1969	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1970	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1971	2	2.86E-08 0.00	2.80E-07 0.00	1.58E-05 0.00	2.22E-04 0.00
1972	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1973	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1974	11	3.50E-09 0.00	5.32E-08 0.00	5.68E-06 0.00	1.11E-04 0.00
1975	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1976	635	6.72E-10 0.00	1.48E-08 0.00	2.65E-06 0.00	6.71E-05 0.04
1977	959	2.68E-10 0.00	7.38E-09 0.00	1.77E-06 0.00	5.14E-05 0.05
1978	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1979	253	3.41E-11 0.00	1.58E-09 0.00	7.36E-07 0.00	2.92E-05 0.01
1980	704	1.06E-11 0.00	6.72E-10 0.00	4.59E-07 0.00	2.16E-05 0.02
1981	36	2.98E-12 0.00	2.68E-10 0.00	2.80E-07 0.00	1.58E-05 0.00
1982	434	7.38E-13 0.00	9.97E-11 0.00	1.66E-07 0.00	1.14E-05 0.00
1983	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1984	21	2.84E-14 0.00	1.06E-11 0.00	5.32E-08 0.00	5.68E-06 0.00
1985	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1986	187	4.44E-16 0.00	7.38E-13 0.00	1.48E-08 0.00	2.65E-06 0.00
1987	352	0.00E+00 0.00	1.58E-13 0.00	7.38E-09 0.00	1.77E-06 0.00
1988	278	0.00E+00 0.00	2.84E-14 0.00	3.50E-09 0.00	1.15E-06 0.00
1989	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1990	2	0.00E+00 0.00	4.44E-16 0.00	6.72E-10 0.00	4.59E-07 0.00
1991	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1992	231	0.00E+00 0.00	0.00E+00 0.00	9.97E-11 0.00	1.66E-07 0.00
Total	4390	Total > 0.00	Total > 0.01	Total > 0.10	Total > 0.65

Upper 95% Confidence Limits

Manufacture Date	Number	1996	2000	2010	2020
		Prob. #	Prob. #	Prob. #	Prob. #
1958	120	7.82E-04 0.09	1.63E-03 0.20	6.74E-03 0.81	1.88E-02 2.25
1959	51	6.39E-04 0.03	1.37E-03 0.07	5.97E-03 0.30	1.72E-02 0.88
1960	69	5.17E-04 0.04	1.15E-03 0.08	5.27E-03 0.36	1.57E-02 1.08
1961	12	4.14E-04 0.00	9.50E-04 0.01	4.63E-03 0.06	1.43E-02 0.17
1962	21	3.29E-04 0.01	7.82E-04 0.02	4.05E-03 0.09	1.29E-02 0.27
1963	1	2.57E-04 0.00	6.39E-04 0.00	3.53E-03 0.00	1.17E-02 0.01
1964	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1965	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1966	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1967	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1968	11	6.29E-05 0.00	2.00E-04 0.00	0.00E+00 0.00	0.00E+00 0.00
1969	0	0.00E+00 0.00	0.00E+00 0.00	1.63E-03 0.02	6.74E-03 0.07
1970	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1971	2	2.19E-05 0.00	8.58E-05 0.00	0.00E+00 0.00	0.00E+00 0.00
1972	0	0.00E+00 0.00	0.00E+00 0.00	9.50E-04 0.00	4.63E-03 0.01
1973	0	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1974	11	5.72E-06 0.00	3.24E-05 0.00	0.00E+00 0.00	0.00E+00 0.00
1975	0	0.00E+00 0.00	0.00E+00 0.00	5.17E-04 0.01	3.06E-03 0.03
1976	635	1.91E-06 0.00	1.53E-05 0.01	0.00E+00 0.00	0.00E+00 0.00
1977	959	9.54E-07 0.00	9.54E-06 0.01	3.29E-04 0.21	2.26E-03 1.43
1978	0	0.00E+00 0.00	0.00E+00 0.00	2.57E-04 0.25	1.92E-03 1.84
1979	253	9.54E-07 0.00	3.81E-06 0.00	0.00E+00 0.00	0.00E+00 0.00
1980	704	9.54E-07 0.00	1.91E-06 0.00	1.54E-04 0.04	1.37E-03 0.35
1981	36	9.54E-07 0.00	1.91E-06 0.00	1.15E-04 0.08	1.15E-03 0.81
1982	434	9.54E-07 0.00	9.54E-07 0.00	8.58E-05 0.00	9.50E-04 0.03
1983	0	0.00E+00 0.00	9.54E-07 0.00	6.29E-05 0.03	7.82E-04 0.34
1984	21	9.54E-07 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1985	0	0.00E+00 0.00	3.24E-05 0.00	5.17E-04 0.01	0.00E+00 0.00
1986	187	9.54E-07 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1987	352	9.54E-07 0.00	9.54E-07 0.00	1.53E-05 0.00	3.29E-04 0.06
1988	278	9.54E-07 0.00	9.54E-07 0.00	9.54E-06 0.00	2.57E-04 0.09
1989	0	0.00E+00 0.00	5.72E-06 0.00	2.00E-04 0.06	0.00E+00 0.00
1990	2	9.54E-07 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
1991	0	9.54E-07 0.00	9.54E-07 0.00	1.91E-06 0.00	1.15E-04 0.00
1992	231	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00	0.00E+00 0.00
		9.54E-07 0.00	9.54E-07 0.00	9.54E-07 0.00	6.29E-05 0.01
Total	4390	Total > 0.18	Total > 0.40	Total > 2.26	Total > 9.82

Yard Choice	5
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	329 (mils)
Failure Level (mils)	250
Yard Name	C-745-K/L yards bottom row cylinders (4390 cylinders)
Yard Ls Mean	0.870
Yard Ls StDev	0.351
ThcN	25
alpha	0.95
Yard Mean	2.068 (mils)
Yard StDev	0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)									
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards bottom row cylinder (4390 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 2.07 and 0.68 mils									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	4.30E-01	51.64	5.44E-01	65.22	7.63E-01	91.60	8.83E-01	106.60
1959	51	4.01E-01	20.44	5.16E-01	26.33	7.46E-01	38.04	8.79E-01	44.84
1960	69	3.71E-01	25.59	4.88E-01	33.69	7.28E-01	50.20	8.70E-01	60.00
1961	12	3.41E-01	4.09	4.60E-01	5.51	7.08E-01	8.50	8.59E-01	10.31
1962	21	3.11E-01	6.54	4.30E-01	9.04	6.88E-01	14.44	8.48E-01	17.81
1963	1	2.82E-01	0.28	4.01E-01	0.40	6.66E-01	0.67	8.36E-01	0.84
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	1.48E-01	1.63	2.53E-01	2.78	5.44E-01	5.98	7.63E-01	8.40
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	8.58E-02	0.17	1.72E-01	0.34	4.60E-01	0.92	7.08E-01	1.42
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	4.17E-02	0.46	1.05E-01	1.15	3.71E-01	4.08	6.44E-01	7.08
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	2.26E-02	14.37	6.90E-02	43.80	3.11E-01	197.69	5.95E-01	378.14
1977	959	1.58E-02	15.20	5.43E-02	52.07	2.82E-01	270.39	5.70E-01	546.59
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	6.85E-03	1.73	3.12E-02	7.89	2.25E-01	56.96	5.16E-01	130.61
1980	704	4.18E-03	2.94	2.26E-02	15.93	1.98E-01	139.48	4.88E-01	343.70
1981	36	2.39E-03	0.09	1.58E-02	0.57	1.72E-01	6.21	4.60E-01	16.54
1982	434	1.27E-03	0.55	1.07E-02	4.63	1.48E-01	64.27	4.30E-01	186.76
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	2.74E-04	0.01	4.18E-03	0.09	1.05E-01	2.20	3.71E-01	7.79
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	3.52E-05	0.01	1.27E-03	0.24	6.90E-02	12.90	3.11E-01	58.22
1987	352	9.57E-06	0.00	6.23E-04	0.22	5.43E-02	19.11	2.82E-01	99.25
1988	278	2.01E-06	0.00	2.74E-04	0.08	4.17E-02	11.60	2.53E-01	70.37
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	2.84E-08	0.00	3.52E-05	0.00	2.26E-02	0.05	1.98E-01	0.40
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	2.32E-11	0.00	2.01E-06	0.00	1.07E-02	2.46	1.48E-01	34.21
Total	4390	Total >	145.73	Total >	269.98	Total >	997.74	Total >	2129.86
Upper 95% Confidence Limits									
Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	5.63E-01	67.52	6.69E-01	80.32	8.60E-01	103.21	9.50E-01	114.00
1959	51	5.34E-01	27.24	6.44E-01	32.85	8.46E-01	43.15	9.44E-01	48.16
1960	69	5.05E-01	34.83	6.18E-01	42.63	8.31E-01	57.35	9.38E-01	64.72
1961	12	4.75E-01	5.70	5.91E-01	7.09	8.15E-01	9.78	9.31E-01	11.17
1962	21	4.45E-01	9.34	5.63E-01	11.82	7.98E-01	16.75	9.23E-01	19.39
1963	1	4.15E-01	0.41	5.34E-01	0.53	7.79E-01	0.78	9.15E-01	0.92
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	2.66E-01	2.93	3.84E-01	4.23	6.69E-01	7.36	8.60E-01	9.46
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	1.85E-01	0.37	2.95E-01	0.59	5.91E-01	1.18	8.15E-01	1.63
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.16E-01	1.28	2.11E-01	2.32	5.05E-01	5.55	7.60E-01	8.35
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	7.87E-02	49.98	1.61E-01	101.93	4.45E-01	282.54	7.17E-01	455.12
1977	959	6.29E-02	60.35	1.37E-01	131.84	4.15E-01	397.68	6.94E-01	665.15
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	3.74E-02	9.45	9.65E-02	24.40	3.54E-01	89.61	6.44E-01	162.95
1980	704	2.75E-02	19.38	7.87E-02	55.41	3.24E-01	228.29	6.18E-01	434.95
1981	36	1.96E-02	0.70	6.29E-02	2.27	2.95E-01	10.61	5.91E-01	21.26
1982	434	1.33E-02	5.78	4.91E-02	21.33	2.66E-01	115.44	5.63E-01	244.21
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	5.25E-03	0.11	2.75E-02	0.58	2.11E-01	4.43	5.05E-01	10.60
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	1.53E-03	0.29	1.33E-02	2.49	1.61E-01	30.02	4.45E-01	83.20
1987	352	7.05E-04	0.25	8.63E-03	3.04	1.37E-01	48.39	4.15E-01	145.97
1988	278	2.78E-04	0.08	5.25E-03	1.46	1.16E-01	32.27	3.84E-01	106.36
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	2.19E-05	0.00	1.53E-03	0.00	7.87E-02	0.16	3.24E-01	0.65
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	2.78E-04	0.06	4.91E-02	11.35	2.66E-01	61.45
Total	4390	Total >	295.99	Total >	527.20	Total >	1495.91	Total >	2670.19

Yard Choice	5
Row (1=bottom, 2=top)	1
Initial Thickness (mils)	345.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-K/L yards bottom row cylinders (4390 cylinders)
Yard In Mean	0.670
Yard In StDev	0.351
The N	25
alpha	0.95
Yard Mean	2.068 (mils)
Yard StDev	0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)													
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards bottom row cylinders (4390 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean,std.dev. are 2.07 and 0.68 mils/yr.													
Manufacture Date		Number	1996		2000		2010		2020				
			Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958		120	6.07E-06	0.00	2.16E-05	0.00	2.49E-04	0.03	1.43E-03	0.17			
1959		51	4.28E-06	0.00	1.60E-05	0.00	2.02E-04	0.01	1.23E-03	0.06			
1960		69	2.97E-06	0.00	1.17E-05	0.00	1.63E-04	0.01	1.05E-03	0.07			
1961		12	2.02E-06	0.00	8.50E-06	0.00	1.30E-04	0.00	8.95E-04	0.01			
1962		21	1.36E-06	0.00	6.07E-06	0.00	1.04E-04	0.00	7.58E-04	0.02			
1963		1	8.93E-07	0.00	4.28E-06	0.00	8.16E-05	0.00	6.39E-04	0.00			
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968		11	7.86E-08	0.00	5.75E-07	0.00	2.16E-05	0.00	2.49E-04	0.00			
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971		2	1.30E-08	0.00	1.34E-07	0.00	8.50E-06	0.00	1.30E-04	0.00			
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1974		11	1.51E-09	0.00	2.45E-08	0.00	2.97E-06	0.00	6.38E-05	0.00			
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976		635	2.80E-10	0.00	6.64E-09	0.00	1.36E-06	0.00	3.78E-05	0.02			
1977		959	1.10E-10	0.00	3.25E-09	0.00	8.93E-07	0.00	2.87E-05	0.03			
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979		253	1.34E-11	0.00	6.71E-10	0.00	3.63E-07	0.00	1.60E-05	0.00			
1980		704	4.07E-12	0.00	2.80E-10	0.00	2.24E-07	0.00	1.17E-05	0.01			
1981		36	1.11E-12	0.00	1.10E-10	0.00	1.34E-07	0.00	8.50E-06	0.00			
1982		434	2.68E-13	0.00	3.99E-11	0.00	7.86E-08	0.00	6.07E-06	0.00			
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984		21	9.66E-15	0.00	4.07E-12	0.00	2.45E-08	0.00	2.97E-06	0.00			
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986		187	1.11E-16	0.00	2.68E-13	0.00	6.64E-09	0.00	1.36E-06	0.00			
1987		352	0.00E+00	0.00	5.56E-14	0.00	3.25E-09	0.00	8.93E-07	0.00			
1988		278	0.00E+00	0.00	9.66E-15	0.00	1.51E-09	0.00	5.75E-07	0.00			
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990		2	0.00E+00	0.00	1.11E-16	0.00	2.80E-10	0.00	2.24E-07	0.00			
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992		231	0.00E+00	0.00	0.00E+00	0.00	3.99E-11	0.00	7.86E-08	0.00			
Total		4390	Total >	0.00	Total >	0.00	Total >	0.06	Total >	0.41			
Upper 95% Confidence Limits													
Manufacture Date		Number	1996		2000		2010		2020				
			Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958		120	5.38E-04	0.06	1.14E-03	0.14	4.95E-03	0.59	1.43E-02	1.72			
1959		51	4.37E-04	0.02	9.58E-04	0.05	4.37E-03	0.22	1.30E-02	0.67			
1960		69	3.51E-04	0.02	7.96E-04	0.05	3.84E-03	0.27	1.19E-02	0.82			
1961		12	2.79E-04	0.00	6.57E-04	0.01	3.36E-03	0.04	1.08E-02	0.13			
1962		21	2.20E-04	0.00	5.38E-04	0.01	2.93E-03	0.06	9.72E-03	0.20			
1963		1	1.72E-04	0.00	4.37E-04	0.00	2.54E-03	0.00	8.76E-03	0.01			
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968		11	4.01E-05	0.00	1.33E-04	0.00	1.14E-03	0.01	4.95E-03	0.05			
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971		2	1.34E-05	0.00	5.63E-05	0.00	6.57E-04	0.00	3.36E-03	0.01			
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1974		11	3.81E-06	0.00	2.00E-05	0.00	3.51E-04	0.00	2.19E-03	0.02			
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976		635	9.54E-07	0.00	9.54E-06	0.01	2.20E-04	0.14	1.60E-03	1.02			
1977		959	9.54E-07	0.00	5.72E-06	0.01	1.72E-04	0.16	1.36E-03	1.30			
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979		253	9.54E-07	0.00	1.91E-06	0.00	1.01E-04	0.03	9.58E-04	0.24			
1980		704	9.54E-07	0.00	9.54E-07	0.00	7.53E-05	0.05	7.96E-04	0.56			
1981		36	9.54E-07	0.00	9.54E-07	0.00	5.63E-05	0.00	6.57E-04	0.02			
1982		434	9.54E-07	0.00	9.54E-07	0.00	4.01E-05	0.02	5.38E-04	0.23			
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984		21	9.54E-07	0.00	9.54E-07	0.00	2.00E-05	0.00	3.51E-04	0.01			
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986		187	9.54E-07	0.00	9.54E-07	0.00	9.54E-06	0.00	2.20E-04	0.04			
1987		352	9.54E-07	0.00	9.54E-07	0.00	5.72E-06	0.00	1.72E-04	0.06			
1988		278	9.54E-07	0.00	9.54E-07	0.00	3.81E-06	0.00	1.33E-04	0.04			
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990		2	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	7.53E-05	0.00			
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992		231	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	4.01E-05	0.01			
Total		4390	Total >	0.12	Total >	0.28	Total >	1.61	Total >	7.16			

Yard Choice 5
Row (1=bottom,2=top) 1
Initial Thickness (mils) 345.5 (mils)
Failure Level (mils) 250
Yard Name C-745-K/L yards bottom row cylinders (4390 cylinders)
Yard Lab Mean 0.670
Yard Lab Std Dev 0.351
Thick 25
alpha 0.95
Yard Mean 2.068 (mils)
Yard Std Dev 0.678 (mils)

C-745-K/L yards bottom row cylinders (4390 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards bottom row cylinder (4390 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 2.07 and 0.68 mils

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	2.37E-01	28.46	3.33E-01	40.01	5.70E-01	68.44	7.51E-01	90.13
1959	51	2.14E-01	10.93	3.09E-01	15.75	5.49E-01	27.98	7.36E-01	37.55
1960	69	1.92E-01	13.27	2.85E-01	19.63	5.26E-01	36.31	7.21E-01	49.72
1961	12	1.71E-01	2.05	2.61E-01	3.13	5.03E-01	6.04	7.04E-01	8.45
1962	21	1.51E-01	3.17	2.37E-01	4.98	4.80E-01	10.08	6.87E-01	14.43
1963	1	1.32E-01	0.13	2.14E-01	0.21	4.56E-01	0.46	6.70E-01	0.67
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	5.65E-02	0.62	1.14E-01	1.26	3.33E-01	3.67	5.70E-01	6.27
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	2.83E-02	0.06	6.88E-02	0.14	2.61E-01	0.52	5.03E-01	1.01
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.16E-02	0.13	3.63E-02	0.40	1.92E-01	2.12	4.32E-01	4.75
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	5.51E-03	3.50	2.15E-02	13.67	1.51E-01	95.92	3.83E-01	243.08
1977	959	3.59E-03	3.45	1.60E-02	15.34	1.32E-01	126.60	3.58E-01	343.41
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	1.33E-03	0.34	8.12E-03	2.06	9.77E-02	24.71	3.09E-01	78.14
1980	704	7.43E-04	0.52	5.51E-03	3.88	8.25E-02	58.11	2.85E-01	200.32
1981	36	3.88E-04	0.01	3.59E-03	0.13	6.88E-02	2.48	2.61E-01	9.38
1982	434	1.87E-04	0.08	2.24E-03	0.97	5.65E-02	24.54	2.37E-01	102.94
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	3.22E-05	0.00	7.43E-04	0.02	3.63E-02	0.76	1.92E-01	4.04
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	3.17E-06	0.00	1.87E-04	0.04	2.15E-02	4.02	1.51E-01	28.25
1987	352	7.38E-07	0.00	8.22E-05	0.03	1.60E-02	5.63	1.32E-01	46.47
1988	278	1.30E-07	0.00	3.22E-05	0.01	1.16E-02	3.22	1.14E-01	31.75
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	1.20E-09	0.00	3.17E-06	0.00	5.51E-03	0.01	8.25E-02	0.17
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	5.33E-13	0.00	1.30E-07	0.00	2.24E-03	0.52	5.65E-02	13.06
Total	4390	Total >	66.73	Total >	121.64	Total >	502.13	Total >	1313.97

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	120	3.67E-01	44.07	4.67E-01	56.08	6.94E-01	83.28	8.50E-01	102.03
1959	51	3.42E-01	17.46	4.42E-01	22.56	6.74E-01	34.37	8.38E-01	42.75
1960	69	3.18E-01	21.93	4.17E-01	28.80	6.53E-01	45.08	8.25E-01	56.95
1961	12	2.93E-01	3.52	3.92E-01	4.71	6.32E-01	7.58	8.12E-01	9.74
1962	21	2.70E-01	5.66	3.67E-01	7.71	6.10E-01	12.81	7.97E-01	16.74
1963	1	2.46E-01	0.25	3.42E-01	0.34	5.87E-01	0.59	7.82E-01	0.78
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	11	1.41E-01	1.55	2.24E-01	2.46	4.67E-01	5.14	6.94E-01	7.63
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	9.06E-02	0.18	1.60E-01	0.32	3.92E-01	0.78	6.32E-01	1.26
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	5.17E-02	0.57	1.06E-01	1.17	3.18E-01	3.50	5.64E-01	6.21
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	635	3.26E-02	20.73	7.63E-02	48.43	2.70E-01	171.18	5.16E-01	327.96
1977	959	2.51E-02	24.07	6.33E-02	60.72	2.46E-01	236.15	4.92E-01	471.87
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	1.37E-02	3.46	4.15E-02	10.50	2.02E-01	51.00	4.42E-01	111.93
1980	704	9.61E-03	6.76	3.26E-02	22.98	1.80E-01	127.05	4.17E-01	293.83
1981	36	6.49E-03	0.23	2.51E-02	0.90	1.60E-01	5.77	3.92E-01	14.12
1982	434	4.18E-03	1.81	1.88E-02	8.16	1.41E-01	61.24	3.67E-01	159.40
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	21	1.45E-03	0.03	9.61E-03	0.20	1.06E-01	2.23	3.18E-01	6.67
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	3.63E-04	0.07	4.18E-03	0.78	7.63E-02	14.26	2.70E-01	50.41
1987	352	1.54E-04	0.05	2.55E-03	0.90	6.33E-02	22.29	2.46E-01	86.68
1988	278	5.44E-05	0.02	1.45E-03	0.40	5.17E-02	14.38	2.24E-01	62.15
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	2.86E-06	0.00	3.65E-04	0.00	3.26E-02	0.07	1.80E-01	0.36
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	5.44E-05	0.01	1.88E-02	4.34	1.41E-01	32.60
Total	4390	Total >	152.43	Total >	278.15	Total >	903.09	Total >	1862.07

Yard Choice	2
Row (1=bottom, 2=top)	2
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-F/G yards top row cylinders (5831 cylinders)
Yard La Mean	-0.009
Yard La SDev	0.280
ThcN	22
alpha	0.95
Yard Mean	1.025 (mils)
Yard SDev	0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)		Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr.							
		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	6.66E-16	0.00	1.31E-14	0.00	5.37E-12	0.00	4.66E-10	0.00
1959	685	2.22E-16	0.00	6.33E-15	0.00	3.19E-12	0.00	3.14E-10	0.00
1960	822	1.11E-16	0.00	3.00E-15	0.00	1.87E-12	0.00	2.10E-10	0.00
1961	683	0.00E+00	0.00	1.33E-15	0.00	1.08E-12	0.00	1.39E-10	0.00
1962	384	0.00E+00	0.00	6.66E-16	0.00	6.08E-13	0.00	9.04E-11	0.00
1963	27	0.00E+00	0.00	2.22E-16	0.00	3.38E-13	0.00	5.83E-11	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	0.00E+00	0.00	0.00E+00	0.00	1.31E-14	0.00	5.37E-12	0.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	0.00E+00	0.00	0.00E+00	0.00	1.33E-15	0.00	1.08E-12	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	0.00E+00	0.00	0.00E+00	0.00	2.22E-16	0.00	3.38E-13	0.00
1974	173	0.00E+00	0.00	0.00E+00	0.00	1.11E-16	0.00	1.84E-13	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	5.13E-14	0.00
1977	316	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	2.62E-14	0.00
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	6.33E-15	0.00
1980	104	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E-15	0.00
1981	150	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.33E-15	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00
Upper 95% Confidence Limits									
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00
1959	685	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.91E-06	0.00
1960	822	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.91E-06	0.00
1961	683	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1962	384	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1963	27	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1974	173	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1977	316	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1980	104	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1981	150	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	0.01	Total >	0.01	Total >	0.01	Total >	0.01

Yard Choice 2
Row (1=bottom,2=top) 2
Initial Thickness (mils) 302.5 (mils)
Failure Level (mils) 250
Yard Name C-745-F/G yards top row cylinders (5831 cylinders)
Yard La Mean -0.009
Yard La St Dev 0.280
The N 22
alpha 0.95
Yard Mean 1.025 (mils)
Yard St Dev 0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	1.01E-01	88.81	1.87E-01	163.79	4.72E-01	414.23	7.28E-01	638.31
1959	685	8.43E-02	57.74	1.63E-01	111.61	4.43E-01	303.28	7.07E-01	484.10
1960	822	6.92E-02	56.85	1.41E-01	115.63	4.13E-01	339.40	6.84E-01	562.65
1961	683	5.59E-02	38.17	1.20E-01	82.02	3.83E-01	261.57	6.61E-01	451.60
1962	384	4.44E-02	17.05	1.01E-01	38.89	3.53E-01	135.60	6.37E-01	244.55
1963	27	3.47E-02	0.94	8.43E-02	2.28	3.24E-01	8.74	6.12E-01	16.51
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	7.19E-03	0.65	2.65E-02	2.41	1.87E-01	17.00	4.72E-01	42.98
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	1.97E-03	0.08	1.00E-02	0.43	1.20E-01	4.92	3.83E-01	15.70
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	6.80E-04	0.27	4.84E-03	1.93	8.43E-02	33.63	3.24E-01	129.10
1974	173	3.71E-04	0.06	3.15E-03	0.54	6.92E-02	11.97	2.94E-01	50.94
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	9.20E-05	0.08	1.18E-03	0.97	4.44E-02	36.42	2.38E-01	195.56
1977	316	4.13E-05	0.01	6.80E-04	0.21	3.47E-02	10.95	2.12E-01	66.99
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	6.38E-06	0.00	1.91E-04	0.01	1.99E-02	1.01	1.63E-01	8.31
1980	104	2.14E-06	0.00	9.20E-05	0.01	1.45E-02	1.51	1.41E-01	14.63
1981	150	6.33E-07	0.00	4.13E-05	0.01	1.04E-02	1.56	1.20E-01	18.01
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	0.00E+00	0.00	7.66E-11	0.00	9.20E-05	0.02	1.45E-02	3.02
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	260.72	Total >	520.75	Total >	1581.80	Total >	2942.97

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	2.15E-01	188.96	3.21E-01	281.56	6.11E-01	536.05	8.37E-01	734.08
1959	685	1.92E-01	131.30	2.91E-01	200.93	5.83E-01	399.33	8.20E-01	561.53
1960	822	1.69E-01	139.06	2.66E-01	218.98	5.55E-01	455.96	8.01E-01	638.61
1961	683	1.48E-01	101.10	2.40E-01	164.20	5.26E-01	359.03	7.81E-01	533.73
1962	384	1.28E-01	49.27	2.15E-01	82.74	4.96E-01	190.58	7.60E-01	292.01
1963	27	1.10E-01	2.97	1.92E-01	5.18	4.67E-01	12.60	7.38E-01	19.93
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	4.26E-02	3.87	9.35E-02	8.51	3.21E-01	29.22	6.11E-01	55.62
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	1.98E-02	0.81	5.30E-02	2.17	2.40E-01	9.86	5.26E-01	21.55
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	1.06E-02	4.24	3.36E-02	13.42	1.92E-01	76.48	4.67E-01	186.23
1974	173	7.47E-03	1.29	2.61E-02	4.51	1.69E-01	29.27	4.37E-01	75.62
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	3.34E-03	2.74	1.47E-02	12.05	1.28E-01	105.22	3.78E-01	310.23
1977	316	2.11E-03	0.67	1.06E-02	3.36	1.10E-01	34.80	3.49E-01	110.42
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	7.23E-04	0.04	5.09E-03	0.26	7.84E-02	4.00	2.93E-01	14.96
1980	104	3.88E-04	0.04	3.34E-03	0.35	6.49E-02	6.75	2.66E-01	27.71
1981	150	1.94E-04	0.03	2.11E-03	0.32	5.30E-02	7.95	2.40E-01	36.06
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	9.54E-07	0.00	9.54E-07	0.00	3.34E-03	0.69	6.49E-02	13.50
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	626.40	Total >	998.52	Total >	2257.97	Total >	3651.78

Yard Choice 2
 Row (1=bottom, 2=top) 2
 Initial Thickness (mils) 312.5 (mils)
 Failure Level (mils) 0
 Yard Name C-745-F/G yards top row cylinders (5831 cylinders)
 Yard In Mean -0.009
 Yard In StDev 0.280
 Tbn 22
 alpha 0.95
 Yard Mean 1.025 (mils)
 Yard StDev 0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)

Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr.

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	2.22E-16	0.00	4.88E-15	0.00	2.24E-12	0.00	2.11E-10	0.00
1959	685	1.11E-16	0.00	2.33E-15	0.00	1.32E-12	0.00	1.41E-10	0.00
1960	822	0.00E+00	0.00	1.11E-15	0.00	7.65E-13	0.00	9.36E-11	0.00
1961	683	0.00E+00	0.00	5.55E-16	0.00	4.36E-13	0.00	6.13E-11	0.00
1962	384	0.00E+00	0.00	2.22E-16	0.00	2.44E-13	0.00	3.97E-11	0.00
1963	27	0.00E+00	0.00	1.11E-16	0.00	1.34E-13	0.00	2.54E-11	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	0.00E+00	0.00	0.00E+00	0.00	4.88E-15	0.00	2.24E-12	0.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	0.00E+00	0.00	0.00E+00	0.00	5.55E-16	0.00	4.36E-13	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	0.00E+00	0.00	0.00E+00	0.00	1.11E-16	0.00	1.34E-13	0.00
1974	173	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	7.24E-14	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1977	316	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.98E-14	0.00
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	9.99E-15	0.00
1979	51	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	104	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	2.33E-15	0.00
1981	150	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.11E-15	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	5.55E-16	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.91E-06	0.00
1959	685	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1960	822	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1961	683	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1962	384	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1963	27	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1974	173	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1977	316	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1980	104	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1981	150	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	0.01	Total >	0.01	Total >	0.01	Total >	0.01

Yard Choice 2
 Row (1=bottom,2=top) 2
 Initial Thickness (mils) 312.5 (mils)
 Failure Level (mils) 250
 Yard Name C-745-F/G yards top row cylinders (5831 cylinders)
 YardLnMean -0.009
 YardLnStDev 0.260
 TheN 22
 alpha 0.55
 Yard Mean 1.025 (mils)
 Yard StDev 0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	2.59E-02	22.75	5.94E-02	52.11	2.30E-01	201.61	4.75E-01	416.29
1959	685	2.03E-02	13.94	4.92E-02	33.73	2.08E-01	142.40	4.50E-01	308.16
1960	822	1.57E-02	12.91	4.03E-02	33.14	1.87E-01	153.52	4.25E-01	349.23
1961	683	1.19E-02	8.13	3.26E-02	22.24	1.67E-01	113.82	4.00E-01	273.02
1962	384	8.86E-03	3.40	2.59E-02	9.96	1.48E-01	56.69	3.75E-01	143.84
1963	27	6.46E-03	0.17	2.03E-02	0.55	1.30E-01	3.50	3.50E-01	9.44
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	9.13E-04	0.08	4.60E-03	0.42	5.94E-02	5.41	2.30E-01	20.92
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	1.91E-04	0.01	1.43E-03	0.06	3.26E-02	1.34	1.67E-01	6.83
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	5.38E-05	0.02	5.63E-04	0.22	2.03E-02	8.12	1.30E-01	51.77
1974	173	2.63E-05	0.00	3.33E-04	0.06	1.57E-02	2.72	1.13E-01	19.57
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	5.18E-06	0.00	1.04E-04	0.09	8.86E-03	7.27	8.36E-02	68.59
1977	316	2.05E-06	0.00	5.38E-05	0.02	6.46E-03	2.04	7.09E-02	22.40
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	2.40E-07	0.00	1.21E-05	0.00	3.20E-03	0.16	4.92E-02	2.51
1980	104	6.95E-08	0.00	5.18E-06	0.00	2.17E-03	0.23	4.03E-02	4.19
1981	150	1.75E-08	0.00	2.05E-06	0.00	1.43E-03	0.21	3.26E-02	4.88
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	0.00E+00	0.00	7.65E-13	0.00	5.18E-06	0.00	2.17E-03	0.45
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total ->	61.43	Total ->	152.60	Total ->	699.03	Total ->	1702.10

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	9.22E-02	80.87	1.54E-01	134.88	3.69E-01	323.64	6.13E-01	537.98
1959	685	7.96E-02	54.49	1.37E-01	93.71	3.45E-01	236.22	5.90E-01	404.17
1960	822	6.80E-02	55.90	1.21E-01	99.34	3.21E-01	263.90	5.66E-01	465.40
1961	683	5.76E-02	39.32	1.06E-01	72.39	2.98E-01	203.34	5.42E-01	370.16
1962	384	4.82E-02	18.52	9.22E-02	35.41	2.75E-01	105.57	5.17E-01	198.71
1963	27	3.99E-02	1.08	7.96E-02	2.15	2.53E-01	6.82	4.93E-01	13.30
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	1.26E-02	1.15	3.27E-02	2.97	1.54E-01	14.00	3.69E-01	33.58
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	5.09E-03	0.21	1.64E-02	0.67	1.06E-01	4.35	2.98E-01	12.21
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	2.45E-03	0.98	9.53E-03	3.80	7.96E-02	31.74	2.53E-01	100.85
1974	173	1.63E-03	0.28	7.04E-03	1.22	6.80E-02	11.77	2.31E-01	40.01
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	6.42E-04	0.53	3.51E-03	2.94	4.82E-02	39.54	1.91E-01	156.42
1977	316	3.78E-04	0.12	2.45E-03	0.77	3.99E-02	12.62	1.72E-01	54.29
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	1.12E-04	0.01	1.64E-03	0.05	2.64E-02	1.34	1.37E-01	6.98
1980	104	5.53E-05	0.01	6.42E-04	0.07	2.10E-02	2.18	1.21E-01	12.57
1981	150	2.48E-05	0.00	3.78E-04	0.06	1.64E-02	2.46	1.06E-01	15.90
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	9.54E-07	0.00	9.54E-07	0.00	6.42E-04	0.13	2.10E-02	4.36
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total ->	253.46	Total ->	450.44	Total ->	1259.62	Total ->	2426.89

Yard Choice	2
Row (1=bottom,2=top)	2
InitialThickness (mils)	329 (mils)
FailureLevel (mils)	0
YardName	C-745-F/G yards top row cylinders (5831 cylinders)
YardLnMean	-0.009
YardLnStDev	0.280
ThcN	22
alpha	0.95
Yard Mean	1.025 (mils)
Yard StDev	0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)										
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr.										
Manufacture Date		Number	1996		2000		2010		2020	
			Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958		877	0.00E+00	0.00	9.99E-16	0.00	5.45E-13	0.00	5.85E-11	0.00
1959		685	0.00E+00	0.00	4.44E-16	0.00	3.17E-13	0.00	3.87E-11	0.00
1960		822	0.00E+00	0.00	2.22E-16	0.00	1.81E-13	0.00	2.53E-11	0.00
1961		683	0.00E+00	0.00	1.11E-16	0.00	1.01E-13	0.00	1.64E-11	0.00
1962		384	0.00E+00	0.00	0.00E+00	0.00	5.60E-14	0.00	1.05E-11	0.00
1963		27	0.00E+00	0.00	0.00E+00	0.00	3.03E-14	0.00	6.62E-12	0.00
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968		91	0.00E+00	0.00	0.00E+00	0.00	9.99E-16	0.00	5.45E-13	0.00
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971		41	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1972		0	0.00E+00	0.00	0.00E+00	0.00	1.11E-16	0.00	1.01E-13	0.00
1973		399	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974		173	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.03E-14	0.00
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.61E-14	0.00
1976		820	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1977		316	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	4.22E-15	0.00
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	2.11E-15	0.00
1979		51	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980		104	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	4.44E-16	0.00
1981		150	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	2.22E-16	0.00
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.11E-16	0.00
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990		208	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total		5831	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00
Upper 95% Confidence Limits										
Manufacture Date		Number	1996		2000		2010		2020	
			Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958		877	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1959		685	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1960		822	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1961		683	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1962		384	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1963		27	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968		91	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971		41	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973		399	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1974		173	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976		820	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1977		316	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979		51	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1980		104	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1981		150	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1982		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990		208	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total		5831	Total >	0.01	Total >	0.01	Total >	0.01	Total >	0.01

Yard Choice: 2
 Row (1=bottom, 2=top): 2
 Initial Thickness (mils): 329 (mils)
 Failure Level (mils): 250
 Yard Name: C-745-F/G yards top row cylinders (5831 cylinders)
 Yard Lat Mean: -0.009
 Yard Lat StDev: 0.260
 The N: 22
 alpha: 0.95
 Yard Mean: 1.025 (mils)
 Yard StDev: 0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	2.23E-03	1.95	6.95E-03	6.10	5.06E-02	44.36	1.68E-01	147.02
1959	685	1.61E-03	1.10	5.35E-03	3.67	4.33E-02	29.65	1.52E-01	104.43
1960	822	1.14E-03	0.93	4.06E-03	3.34	3.67E-02	30.20	1.38E-01	113.41
1961	683	7.89E-04	0.54	3.03E-03	2.07	3.09E-02	21.12	1.24E-01	84.86
1962	384	5.35E-04	0.21	2.23E-03	0.86	2.58E-02	9.90	1.11E-01	42.73
1963	27	3.55E-04	0.01	1.61E-03	0.04	2.13E-02	0.58	9.91E-02	2.68
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	2.95E-05	0.00	2.29E-04	0.02	6.95E-03	0.63	5.06E-02	4.60
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	4.25E-06	0.00	5.17E-05	0.00	3.03E-03	0.12	3.09E-02	1.27
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	9.09E-07	0.00	1.61E-05	0.01	1.61E-03	0.64	2.13E-02	8.50
1974	173	3.84E-07	0.00	8.47E-06	0.00	1.14E-03	0.20	1.74E-02	3.01
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	5.50E-08	0.00	2.02E-06	0.00	5.35E-04	0.44	1.13E-02	9.25
1977	316	1.83E-08	0.00	9.09E-07	0.00	3.55E-04	0.11	8.91E-03	2.82
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	1.48E-09	0.00	1.51E-07	0.00	1.44E-04	0.01	5.35E-03	0.27
1980	104	3.49E-10	0.00	5.50E-08	0.00	8.77E-05	0.01	4.06E-03	0.42
1981	150	7.08E-11	0.00	1.83E-08	0.00	5.17E-05	0.01	3.03E-03	0.45
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	0.00E+00	0.00	7.77E-16	0.00	5.50E-08	0.00	8.77E-05	0.02
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	4.75	Total >	16.10	Total >	137.97	Total >	525.75

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	2.13E-02	18.66	4.17E-02	36.60	1.39E-01	122.00	2.99E-01	262.12
1959	685	1.76E-02	12.03	3.57E-02	24.46	1.26E-01	86.51	2.81E-01	192.33
1960	822	1.44E-02	11.80	3.03E-02	24.92	1.14E-01	93.82	2.63E-01	216.24
1961	683	1.16E-02	7.92	2.55E-02	17.43	1.03E-01	70.12	2.46E-01	167.85
1962	384	9.25E-03	3.55	2.13E-02	8.17	9.19E-02	35.28	2.29E-01	87.90
1963	27	7.28E-03	0.20	1.76E-02	0.47	8.18E-02	2.21	2.13E-01	5.74
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	1.74E-03	0.16	5.65E-03	0.51	4.17E-02	3.80	1.39E-01	12.66
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	5.73E-04	0.02	2.40E-03	0.10	2.55E-02	1.05	1.03E-01	4.21
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	2.38E-04	0.10	1.23E-03	0.49	1.76E-02	7.01	8.18E-02	32.63
1974	173	1.46E-04	0.03	8.50E-04	0.15	1.44E-02	2.48	7.24E-02	12.53
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	4.77E-05	0.04	3.75E-04	0.31	9.25E-03	7.58	5.57E-02	45.68
1977	316	2.57E-05	0.01	2.38E-04	0.08	7.28E-03	2.30	4.84E-02	15.29
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	5.72E-06	0.00	8.58E-05	0.00	4.32E-03	0.22	3.57E-02	1.82
1980	104	1.91E-06	0.00	4.77E-05	0.00	3.25E-03	0.34	3.03E-02	3.15
1981	150	9.54E-07	0.00	2.57E-05	0.00	2.40E-03	0.36	2.55E-02	3.83
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	9.54E-07	0.00	9.54E-07	0.00	4.77E-05	0.01	3.25E-03	0.68
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total >	54.50	Total >	113.70	Total >	435.08	Total >	1064.66

Yard Choice	2
Row (1=bottom,2=top)	2
Initial Thickness (mils)	345.5 (mils)
Failure Level (mils)	0
YardName	C-745-F/G yards top row cylinders (5831 cylinders)
YardLnMean	-0.009
YardLnStDev	0.260
TheN	22
alpha	0.95
Yard Mean	1.025 (mils)
Yard StDev	0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)												
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr.												
Manufacture Date	Number	1996		2000		2010		2020				
		Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958	877	0.00E+00	0.00	2.22E-16	0.00	1.37E-13	0.00	1.67E-11	0.00			
1959	685	0.00E+00	0.00	1.11E-16	0.00	7.85E-14	0.00	1.09E-11	0.00			
1960	822	0.00E+00	0.00	0.00E+00	0.00	4.42E-14	0.00	7.04E-12	0.00			
1961	683	0.00E+00	0.00	0.00E+00	0.00	2.44E-14	0.00	4.50E-12	0.00			
1962	384	0.00E+00	0.00	0.00E+00	0.00	1.33E-14	0.00	2.85E-12	0.00			
1963	27	0.00E+00	0.00	0.00E+00	0.00	7.11E-15	0.00	1.78E-12	0.00			
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968	91	0.00E+00	0.00	0.00E+00	0.00	2.22E-16	0.00	1.37E-13	0.00			
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971	41	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	2.44E-14	0.00			
1973	399	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1974	173	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	7.11E-15	0.00			
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.66E-15	0.00			
1976	820	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1977	316	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	9.99E-16	0.00			
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	4.44E-16	0.00			
1979	51	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1980	104	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.11E-16	0.00			
1981	150	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990	208	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
Total	5831	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00			
Upper 95% Confidence Limits												
Manufacture Date	Number	1996		2000		2010		2020				
		Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958	877	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1959	685	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1960	822	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1961	683	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1962	384	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1963	27	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968	91	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971	41	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973	399	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1974	173	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976	820	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1977	316	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979	51	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1980	104	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1981	150	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990	208	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
Total	5831	Total >	0.01	Total >	0.01	Total >	0.01	Total >	0.01			

Yard Choice	2
Row (1=bottom, 2=top)	2
Initial Thickness (mils)	345.5 (mils)
Failure Level (mils)	250
Yard Name	C-745-F/G yards top row cylinders (5831 cylinders)
Yard La Mean	-0.009
Yard La StDev	0.260
ThickN	22
alpha	0.95
Yard Mean	1.025 (mils)
Yard StDev	0.281 (mils)

C-745-F/G yards top row cylinders (5831 cylinders)									
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-F/G yards top row cylinders (5831 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 1.02 and 0.28 mils/yr									
		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	1.77E-04	0.15	7.16E-04	0.63	8.95E-03	7.85	4.53E-02	39.73
1959	685	1.19E-04	0.08	5.17E-04	0.35	7.29E-03	5.00	3.97E-02	27.17
1960	822	7.83E-05	0.06	3.68E-04	0.30	5.89E-03	4.84	3.45E-02	28.38
1961	683	5.04E-05	0.03	2.57E-04	0.18	4.71E-03	3.22	2.99E-02	20.40
1962	384	3.17E-05	0.01	1.77E-04	0.07	3.73E-03	1.43	2.57E-02	9.86
1963	27	1.94E-05	0.00	1.19E-04	0.00	2.92E-03	0.08	2.19E-02	0.59
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	1.04E-06	0.00	1.15E-05	0.00	7.16E-04	0.07	8.95E-03	0.81
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	1.10E-07	0.00	2.00E-06	0.00	2.57E-04	0.01	4.71E-03	0.19
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	1.89E-08	0.00	5.16E-07	0.00	1.19E-04	0.05	2.92E-03	1.17
1974	173	7.06E-09	0.00	2.45E-07	0.00	7.83E-05	0.01	2.26E-03	0.39
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	7.81E-10	0.00	4.71E-08	0.00	3.17E-05	0.03	1.31E-03	1.07
1977	316	2.26E-10	0.00	1.89E-08	0.00	1.94E-05	0.01	9.74E-04	0.31
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	1.35E-11	0.00	2.45E-09	0.00	6.66E-06	0.00	5.17E-04	0.03
1980	104	2.70E-12	0.00	7.81E-10	0.00	3.72E-06	0.00	3.68E-04	0.04
1981	150	4.58E-13	0.00	2.26E-10	0.00	2.00E-06	0.00	2.57E-04	0.04
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	0.00E+00	0.00	0.00E+00	0.00	7.81E-10	0.00	3.72E-06	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total ->	0.35	Total ->	1.53	Total ->	22.59	Total ->	130.19
Upper 95% Confidence Limits									
		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	877	4.86E-03	4.27	1.10E-02	9.60	4.85E-02	42.53	1.30E-01	113.93
1959	685	3.87E-03	2.65	9.07E-03	6.21	4.29E-02	29.41	1.20E-01	81.96
1960	822	3.04E-03	2.50	7.44E-03	6.12	3.78E-02	31.08	1.10E-01	90.30
1961	683	2.36E-03	1.61	6.05E-03	4.13	3.31E-02	22.62	1.01E-01	68.65
1962	384	1.81E-03	0.69	4.86E-03	1.87	2.89E-02	11.08	9.17E-02	35.20
1963	27	1.36E-03	0.04	3.87E-03	0.10	2.50E-02	0.67	8.33E-02	2.25
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	91	2.57E-04	0.02	1.01E-03	0.09	1.10E-02	1.00	4.85E-02	4.41
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	41	7.15E-05	0.00	3.74E-04	0.02	6.05E-03	0.25	3.31E-02	1.36
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	399	2.57E-05	0.01	1.73E-04	0.07	3.87E-03	1.54	2.50E-02	9.97
1974	173	1.43E-05	0.00	1.13E-04	0.02	3.04E-03	0.53	2.15E-02	3.72
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	820	3.81E-06	0.00	4.39E-05	0.04	1.81E-03	1.48	1.56E-02	12.77
1977	316	1.91E-06	0.00	2.57E-05	0.01	1.36E-03	0.43	1.31E-02	4.14
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	51	9.54E-07	0.00	7.63E-06	0.00	7.41E-04	0.04	9.07E-03	0.46
1980	104	9.54E-07	0.00	3.81E-06	0.00	5.31E-04	0.06	7.44E-03	0.77
1981	150	9.54E-07	0.00	1.91E-06	0.00	3.74E-04	0.06	6.05E-03	0.91
1982	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1988	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	208	9.54E-07	0.00	9.54E-07	0.00	3.81E-06	0.00	5.31E-04	0.11
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
Total	5831	Total ->	11.81	Total ->	28.28	Total ->	142.78	Total ->	430.91

Yard Choice	5
Row (1=bottom,2=top)	2
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-K/L yards top row cylinders (4383 cylinders)
Yard Ln Mean	0.481
Yard Ln StDev	0.268
ThcN	17
alpha	0.95
Yard Mean	1.673 (mils)
Yard StDev	0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)													
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 1.67 and 0.45 mils/yr.													
Manufacture Date		Number	1996		2000		2010		2020				
			Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958		119	1.42E-09	0.00	1.30E-08	0.00	9.18E-07	0.00	1.94E-05	0.00			
1959		51	7.73E-10	0.00	7.71E-09	0.00	6.39E-07	0.00	1.49E-05	0.00			
1960		69	4.09E-10	0.00	4.49E-09	0.00	4.40E-07	0.00	1.13E-05	0.00			
1961		11	2.10E-10	0.00	2.56E-09	0.00	2.98E-07	0.00	8.55E-06	0.00			
1962		20	1.04E-10	0.00	1.42E-09	0.00	2.00E-07	0.00	6.40E-06	0.00			
1963		1	5.03E-11	0.00	7.73E-10	0.00	1.32E-07	0.00	4.75E-06	0.00			
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968		10	7.29E-13	0.00	2.34E-11	0.00	1.30E-08	0.00	9.18E-07	0.00			
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971		2	3.16E-14	0.00	1.86E-12	0.00	2.56E-09	0.00	2.98E-07	0.00			
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1974		11	7.77E-16	0.00	9.57E-14	0.00	4.09E-10	0.00	8.58E-08	0.00			
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976		634	0.00E+00	0.00	9.77E-15	0.00	1.04E-10	0.00	3.46E-08	0.00			
1977		959	0.00E+00	0.00	2.78E-15	0.00	5.03E-11	0.00	2.14E-08	0.00			
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979		253	0.00E+00	0.00	2.22E-16	0.00	1.05E-11	0.00	7.71E-09	0.00			
1980		704	0.00E+00	0.00	0.00E+00	0.00	4.51E-12	0.00	4.49E-09	0.00			
1981		35	0.00E+00	0.00	0.00E+00	0.00	1.86E-12	0.00	2.56E-09	0.00			
1982		434	0.00E+00	0.00	0.00E+00	0.00	7.29E-13	0.00	1.42E-09	0.00			
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984		20	0.00E+00	0.00	0.00E+00	0.00	9.57E-14	0.00	4.09E-10	0.00			
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986		187	0.00E+00	0.00	0.00E+00	0.00	9.77E-15	0.00	1.04E-10	0.00			
1987		352	0.00E+00	0.00	0.00E+00	0.00	2.78E-15	0.00	5.03E-11	0.00			
1988		278	0.00E+00	0.00	0.00E+00	0.00	7.77E-16	0.00	2.34E-11	0.00			
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990		2	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	4.51E-12	0.00			
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992		231	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	7.29E-13	0.00			
Total		4383	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00			
Upper 95% Confidence Limits													
Manufacture Date		Number	1996		2000		2010		2020				
			Prob.	#	Prob.	#	Prob.	#	Prob.	#			
1958		119	1.72E-05	0.00	5.23E-05	0.01	4.74E-04	0.06	2.30E-03	0.27			
1959		51	1.24E-05	0.00	4.01E-05	0.00	3.93E-04	0.02	2.00E-03	0.10			
1960		69	8.58E-06	0.00	3.03E-05	0.00	3.24E-04	0.02	1.74E-03	0.12			
1961		11	5.72E-06	0.00	2.29E-05	0.00	2.65E-04	0.00	1.50E-03	0.02			
1962		20	3.81E-06	0.00	1.72E-05	0.00	2.16E-04	0.00	1.29E-03	0.03			
1963		1	2.86E-06	0.00	1.24E-05	0.00	1.75E-04	0.00	1.11E-03	0.00			
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1968		10	9.54E-07	0.00	1.91E-06	0.00	5.25E-05	0.00	4.74E-04	0.00			
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1971		2	9.54E-07	0.00	9.54E-07	0.00	2.29E-05	0.00	2.65E-04	0.00			
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1973		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1974		11	9.54E-07	0.00	9.54E-07	0.00	8.58E-06	0.00	1.39E-04	0.00			
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1976		634	9.54E-07	0.00	9.54E-07	0.00	3.81E-06	0.00	8.77E-05	0.06			
1977		959	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00	6.87E-05	0.07			
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1979		253	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	4.01E-05	0.01			
1980		704	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	3.05E-05	0.02			
1981		35	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.29E-05	0.00			
1982		434	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.72E-05	0.01			
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1984		20	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	8.58E-06	0.00			
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1986		187	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	3.81E-06	0.00			
1987		352	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00			
1988		278	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.91E-06	0.00			
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1990		2	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00			
1992		231	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00			
Total		4383	Total >	0.01	Total >	0.01	Total >	0.11	Total >	0.71			

Yard Choice	5
Row (1=bottom,2=top)	2
Initial Thickness (mils)	302.5 (mils)
Failure Level (mils)	250
Yard Name	C-745-K/L yards top row cylinders (4383 cylinders)
Yard Lab Mean	0.481
Yard Lab StDev	0.268
Thick	17
alpha	0.95
Yard Mean	1.673 (mils)
Yard StDev	0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)									
Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 302.5 mils. Sample arith. mean, std. dev. are 1.67 and 0.45 mils/yr									
		1996		2000		2010		2020	
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	7.22E-01	85.96	8.32E-01	99.04	9.61E-01	114.33	9.92E-01	118.06
1959	51	6.88E-01	35.09	8.09E-01	41.25	9.54E-01	48.66	9.91E-01	50.53
1960	69	6.51E-01	44.93	7.83E-01	54.00	9.47E-01	65.32	9.89E-01	68.25
1961	11	6.12E-01	6.73	7.54E-01	8.29	9.38E-01	10.32	9.87E-01	10.86
1962	20	5.70E-01	11.39	7.22E-01	14.45	9.28E-01	18.56	9.85E-01	19.70
1963	1	5.25E-01	0.53	6.88E-01	0.69	9.17E-01	0.92	9.82E-01	0.98
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	2.92E-01	2.92	4.80E-01	4.80	8.32E-01	8.32	9.61E-01	9.61
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	1.66E-01	0.33	3.38E-01	0.68	7.54E-01	1.51	9.38E-01	1.88
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	7.38E-02	0.81	2.05E-01	2.25	6.51E-01	7.16	9.04E-01	9.94
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	3.57E-02	22.60	1.31E-01	82.78	5.70E-01	361.08	8.72E-01	552.94
1977	959	2.30E-02	22.09	9.99E-02	95.76	5.25E-01	503.91	8.53E-01	818.36
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	7.99E-03	2.02	5.24E-02	13.27	4.33E-01	109.49	8.09E-01	204.61
1980	704	4.20E-03	2.96	3.57E-02	25.10	3.85E-01	271.26	7.83E-01	550.99
1981	35	2.01E-03	0.07	2.30E-02	0.81	3.38E-01	11.83	7.54E-01	26.39
1982	434	8.63E-04	0.37	1.40E-02	6.09	2.92E-01	126.54	7.22E-01	313.51
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	1.04E-04	0.00	4.20E-03	0.08	2.05E-01	4.09	6.51E-01	13.02
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	5.72E-06	0.00	8.63E-04	0.16	1.31E-01	24.42	5.70E-01	106.50
1987	352	8.72E-07	0.00	3.25E-04	0.11	9.99E-02	35.15	5.25E-01	184.96
1988	278	8.94E-08	0.00	1.04E-04	0.03	7.38E-02	20.51	4.80E-01	133.36
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	1.56E-10	0.00	5.72E-06	0.00	3.57E-02	0.07	3.85E-01	0.77
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	3.00E-15	0.00	8.94E-08	0.00	1.40E-02	3.24	2.92E-01	67.35
Total	4383	Total >	238.80	Total >	449.64	Total >	1746.69	Total >	3262.56
Upper 95% Confidence Limits									
Manufacture Date	Number	Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	8.45E-01	100.56	9.25E-01	110.04	9.92E-01	117.99	9.99E-01	118.92
1959	51	8.18E-01	41.70	9.09E-01	46.35	9.89E-01	50.45	9.99E-01	50.95
1960	69	7.87E-01	54.32	8.90E-01	61.44	9.86E-01	68.06	9.99E-01	68.92
1961	11	7.54E-01	8.29	8.69E-01	9.56	9.83E-01	10.81	9.98E-01	10.98
1962	20	7.17E-01	14.34	8.45E-01	16.90	9.79E-01	19.57	9.98E-01	19.96
1963	1	6.78E-01	0.68	8.18E-01	0.82	9.73E-01	0.97	9.98E-01	1.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	4.55E-01	4.55	6.36E-01	6.36	9.25E-01	9.25	9.92E-01	9.92
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	3.19E-01	0.64	5.02E-01	1.00	8.69E-01	1.74	9.83E-01	1.97
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.90E-01	2.16	3.63E-01	4.00	7.87E-01	8.66	9.67E-01	10.63
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	1.29E-01	81.85	2.75E-01	174.64	7.17E-01	454.72	9.49E-01	601.95
1977	959	1.01E-01	96.78	2.35E-01	224.92	6.78E-01	650.24	9.38E-01	899.65
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	5.62E-02	14.21	1.61E-01	40.73	5.93E-01	150.02	9.09E-01	229.94
1980	704	3.96E-02	27.86	1.29E-01	90.89	5.48E-01	385.77	8.90E-01	626.89
1981	35	2.66E-02	0.93	1.01E-01	3.53	5.02E-01	17.57	8.69E-01	30.42
1982	434	1.69E-02	7.35	7.66E-02	33.24	4.55E-01	197.68	8.45E-01	366.74
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	5.55E-03	0.11	3.96E-02	0.79	3.63E-01	7.26	7.87E-01	15.74
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	1.22E-03	0.23	1.69E-02	3.17	2.75E-01	51.51	7.17E-01	134.12
1987	352	4.61E-04	0.16	1.01E-02	3.55	2.35E-01	82.56	6.78E-01	238.67
1988	278	1.43E-04	0.04	5.55E-03	1.54	1.96E-01	54.55	6.36E-01	176.54
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	4.77E-06	0.00	1.22E-03	0.00	1.29E-01	0.26	5.48E-01	1.10
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	1.43E-04	0.03	7.66E-02	17.69	4.55E-01	105.22
Total	4383	Total >	456.77	Total >	833.50	Total >	2357.34	Total >	3720.64

Yard Choice 5
Row (1=bottom,2=top) 2
Initial Thickness (mils) 312.5 (mils)
Failure Level (mils) 0
Yard Name C-745-K/L yards top row cylinders (4383 cylinders)
Yard LA Mean 0.481
Yard LA StDev 0.288
The N 17
alpha 0.95
Yard Mean 1.673 (mils)
Yard StDev 0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)

Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 1.67 and 0.45 mils/yr.

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	6.75E-10	0.00	6.42E-09	0.00	4.99E-07	0.00	1.14E-05	0.00
1959	51	3.62E-10	0.00	3.78E-09	0.00	3.45E-07	0.00	8.66E-06	0.00
1960	69	1.89E-10	0.00	2.18E-09	0.00	2.35E-07	0.00	6.55E-06	0.00
1961	11	9.59E-11	0.00	1.23E-09	0.00	1.58E-07	0.00	4.91E-06	0.00
1962	20	4.71E-11	0.00	6.75E-10	0.00	1.05E-07	0.00	3.65E-06	0.00
1963	1	2.24E-11	0.00	3.62E-10	0.00	6.86E-08	0.00	2.69E-06	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	3.02E-13	0.00	1.03E-11	0.00	6.42E-09	0.00	4.99E-07	0.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	1.24E-14	0.00	7.81E-13	0.00	1.23E-09	0.00	1.58E-07	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	3.33E-16	0.00	3.83E-14	0.00	1.89E-10	0.00	4.42E-08	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	0.00E+00	0.00	3.77E-15	0.00	4.71E-11	0.00	1.75E-08	0.00
1977	959	0.00E+00	0.00	1.11E-15	0.00	2.24E-11	0.00	1.07E-08	0.00
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	0.00E+00	0.00	1.11E-16	0.00	4.54E-12	0.00	3.78E-09	0.00
1980	704	0.00E+00	0.00	0.00E+00	0.00	1.93E-12	0.00	2.18E-09	0.00
1981	35	0.00E+00	0.00	0.00E+00	0.00	7.81E-13	0.00	1.23E-09	0.00
1982	434	0.00E+00	0.00	0.00E+00	0.00	3.02E-13	0.00	6.75E-10	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	0.00E+00	0.00	0.00E+00	0.00	3.83E-14	0.00	1.89E-10	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	0.00E+00	0.00	0.00E+00	0.00	3.77E-15	0.00	4.71E-11	0.00
1987	352	0.00E+00	0.00	0.00E+00	0.00	1.11E-15	0.00	2.24E-11	0.00
1988	278	0.00E+00	0.00	0.00E+00	0.00	3.33E-16	0.00	1.03E-11	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.93E-12	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.02E-13	0.00
Total	4383	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	1.14E-05	0.00	3.62E-05	0.00	3.46E-04	0.04	1.74E-03	0.21
1959	51	7.63E-06	0.00	2.77E-05	0.00	2.86E-04	0.01	1.51E-03	0.08
1960	69	5.72E-06	0.00	2.10E-05	0.00	2.35E-04	0.02	1.31E-03	0.09
1961	11	3.81E-06	0.00	1.53E-05	0.00	1.92E-04	0.00	1.13E-03	0.01
1962	20	2.86E-06	0.00	1.14E-05	0.00	1.54E-04	0.00	9.67E-04	0.02
1963	1	1.91E-06	0.00	7.63E-06	0.00	1.25E-04	0.00	8.26E-04	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	9.54E-07	0.00	9.54E-07	0.00	3.62E-05	0.00	3.46E-04	0.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	9.54E-07	0.00	9.54E-07	0.00	1.53E-05	0.00	1.92E-04	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	9.54E-07	0.00	9.54E-07	0.00	5.72E-06	0.00	9.92E-05	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00	6.10E-05	0.04
1977	959	9.54E-07	0.00	9.54E-07	0.00	1.91E-06	0.00	4.77E-05	0.05
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.77E-05	0.01
1980	704	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.10E-05	0.01
1981	35	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.53E-05	0.00
1982	434	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.14E-05	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	5.72E-06	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00
1987	352	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.91E-06	0.00
1988	278	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
Total	4383	Total >	0.01	Total >	0.01	Total >	0.08	Total >	0.53

Yard Choice 5
 Row (1=bottom,2=top) 2
 InitialThickness (mils) 312.5 (mils)
 FailureLevel (mils) 250
 YardName C-745-K/L yards top row cylinders (4383 cylinders)
 YardLatMom 0.481
 YardLatSDDev 0.268
 TheN 17
 alpha 0.95
 YardMean 1.873 (mils)
 YardSDDev 0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 312.5 mils. Sample arith. mean, std. dev. are 1.67 and 0.45 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	4.76E-01	56.64	6.23E-01	74.12	8.66E-01	103.10	9.61E-01	114.39
1959	51	4.37E-01	22.26	5.88E-01	30.00	8.50E-01	43.36	9.56E-01	48.75
1960	69	3.97E-01	27.37	5.52E-01	38.10	8.32E-01	57.43	9.50E-01	65.54
1961	11	3.57E-01	3.93	5.15E-01	5.66	8.13E-01	8.94	9.43E-01	10.37
1962	20	3.17E-01	6.35	4.76E-01	9.52	7.91E-01	15.83	9.35E-01	18.71
1963	1	2.79E-01	0.28	4.37E-01	0.44	7.68E-01	0.77	9.27E-01	0.93
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	1.15E-01	1.15	2.42E-01	2.42	6.23E-01	6.23	8.66E-01	8.66
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	5.24E-02	0.10	1.43E-01	0.29	5.15E-01	1.03	8.13E-01	1.63
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.79E-02	0.20	7.01E-02	0.77	3.97E-01	4.36	7.43E-01	8.17
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	7.07E-03	4.48	3.80E-02	24.12	3.17E-01	201.23	6.87E-01	435.35
1977	959	4.08E-03	3.92	2.66E-02	25.55	2.79E-01	267.40	6.56E-01	628.80
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	1.11E-03	0.28	1.15E-02	2.92	2.06E-01	52.18	5.88E-01	148.83
1980	704	5.08E-04	0.36	7.07E-03	4.98	1.73E-01	121.91	5.52E-01	388.70
1981	35	2.11E-04	0.01	4.08E-03	0.14	1.43E-01	5.00	5.15E-01	18.01
1982	434	7.73E-05	0.03	2.21E-03	0.96	1.15E-01	50.02	4.76E-01	206.38
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	6.55E-06	0.00	5.08E-04	0.01	7.01E-02	1.40	3.97E-01	7.93
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	2.35E-07	0.00	7.73E-05	0.01	3.80E-02	7.11	3.17E-01	59.35
1987	352	2.80E-08	0.00	2.45E-05	0.01	2.66E-02	9.38	2.79E-01	98.15
1988	278	2.18E-09	0.00	6.55E-06	0.00	1.79E-02	4.99	2.42E-01	67.17
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	1.93E-12	0.00	2.35E-07	0.00	7.07E-03	0.01	1.73E-01	0.35
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	0.00E+00	0.00	2.18E-09	0.00	2.21E-03	0.51	1.15E-01	26.63
Total	4383	Total >	127.37	Total >	220.02	Total >	962.18	Total >	2362.99

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	6.33E-01	75.34	7.63E-01	90.84	9.46E-01	112.58	9.92E-01	118.01
1959	51	5.97E-01	30.42	7.34E-01	37.41	9.36E-01	47.74	9.90E-01	50.48
1960	69	5.59E-01	38.56	7.02E-01	48.43	9.25E-01	63.80	9.88E-01	68.15
1961	11	5.20E-01	5.72	6.68E-01	7.35	9.12E-01	10.03	9.85E-01	10.83
1962	20	4.82E-01	9.63	6.33E-01	12.66	8.97E-01	17.93	9.82E-01	19.64
1963	1	4.42E-01	0.44	5.97E-01	0.60	8.80E-01	0.88	9.78E-01	0.98
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	2.56E-01	2.56	4.04E-01	4.04	7.63E-01	7.63	9.46E-01	9.46
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	1.61E-01	0.32	2.91E-01	0.58	6.68E-01	1.34	9.12E-01	1.82
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	8.78E-02	0.97	1.90E-01	2.09	5.59E-01	6.15	8.61E-01	9.47
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	5.25E-02	33.31	1.34E-01	84.93	4.82E-01	305.29	8.17E-01	517.69
1977	959	3.90E-02	37.39	1.10E-01	105.03	4.42E-01	424.31	7.91E-01	758.64
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	1.93E-02	4.89	6.88E-02	17.40	3.65E-01	92.35	7.34E-01	185.61
1980	704	1.28E-02	9.00	5.25E-02	36.99	3.27E-01	230.45	7.02E-01	494.10
1981	35	8.02E-03	0.28	3.90E-02	1.36	2.91E-01	10.18	6.68E-01	23.39
1982	434	4.74E-03	2.06	2.80E-02	12.15	2.56E-01	110.89	6.33E-01	274.75
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	1.31E-03	0.03	1.28E-02	0.26	1.90E-01	3.81	5.59E-01	11.18
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	2.35E-04	0.04	4.74E-03	0.89	1.34E-01	25.05	4.82E-01	90.05
1987	352	7.82E-05	0.03	2.60E-03	0.92	1.10E-01	38.55	4.42E-01	155.74
1988	278	2.10E-05	0.01	1.31E-03	0.36	8.78E-02	24.40	4.04E-01	112.18
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.54E-07	0.00	2.35E-04	0.00	5.25E-02	0.11	3.27E-01	0.65
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	2.10E-05	0.00	2.80E-02	6.47	2.56E-01	59.02
Total	4383	Total >	251.00	Total >	464.31	Total >	1539.94	Total >	2971.84

Yard Choice	5
Row (1=bottom,2=top)	2
InitialThickness (mils)	329 (mils)
FailureLevel (mils)	0
YardName	C-745-K/L yards top row cylinders (4383 cylinders)
YardLnMem	0.481
YardLnSDev	0.288
Thick	17
alpha	0.95
Yard Mem	1.673 (mils)
Yard SDev	0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)										
Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean, std. dev. are 1.67 and 0.45 mils/yr.										
Manufacture Date	Number	1996		2000		2010		2020		
		Prob.	#	Prob.	#	Prob.	#	Prob.	#	
1958	119	2.01E-10	0.00	2.05E-09	0.00	1.85E-07	0.00	4.76E-06	0.00	
1959	51	1.06E-10	0.00	1.19E-09	0.00	1.26E-07	0.00	3.58E-06	0.00	
1960	69	5.42E-11	0.00	6.73E-10	0.00	8.48E-08	0.00	2.68E-06	0.00	
1961	11	2.70E-11	0.00	3.72E-10	0.00	5.62E-08	0.00	1.99E-06	0.00	
1962	20	1.30E-11	0.00	2.01E-10	0.00	3.68E-08	0.00	1.46E-06	0.00	
1963	1	6.05E-12	0.00	1.06E-10	0.00	2.37E-08	0.00	1.06E-06	0.00	
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1968	10	7.26E-14	0.00	2.72E-12	0.00	2.05E-09	0.00	1.85E-07	0.00	
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1971	2	2.78E-15	0.00	1.93E-13	0.00	3.72E-10	0.00	5.62E-08	0.00	
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1974	11	1.11E-16	0.00	8.77E-15	0.00	5.42E-11	0.00	1.51E-08	0.00	
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1976	634	0.00E+00	0.00	7.77E-16	0.00	1.30E-11	0.00	5.76E-09	0.00	
1977	959	0.00E+00	0.00	2.22E-16	0.00	6.05E-12	0.00	3.47E-09	0.00	
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1979	253	0.00E+00	0.00	0.00E+00	0.00	1.17E-12	0.00	1.19E-09	0.00	
1980	704	0.00E+00	0.00	0.00E+00	0.00	4.86E-13	0.00	6.73E-10	0.00	
1981	35	0.00E+00	0.00	0.00E+00	0.00	1.93E-13	0.00	3.72E-10	0.00	
1982	434	0.00E+00	0.00	0.00E+00	0.00	7.26E-14	0.00	2.01E-10	0.00	
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1984	20	0.00E+00	0.00	0.00E+00	0.00	8.77E-15	0.00	5.42E-11	0.00	
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1986	187	0.00E+00	0.00	0.00E+00	0.00	7.77E-16	0.00	1.30E-11	0.00	
1987	352	0.00E+00	0.00	0.00E+00	0.00	2.22E-16	0.00	6.05E-12	0.00	
1988	278	0.00E+00	0.00	0.00E+00	0.00	1.11E-16	0.00	2.72E-12	0.00	
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1990	2	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	4.86E-13	0.00	
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	
1992	231	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	7.26E-14	0.00	
Total	4383	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00	

Upper 95% Confidence Limits										
Manufacture Date		Number	1996		2000		2010		2020	
			Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958		119	5.72E-06	0.00	2.00E-05	0.00	2.08E-04	0.02	1.11E-03	0.13
1959		51	3.81E-06	0.00	1.53E-05	0.00	1.70E-04	0.01	9.58E-04	0.05
1960		69	2.86E-06	0.00	1.14E-05	0.00	1.39E-04	0.01	8.24E-04	0.06
1961		11	1.91E-06	0.00	8.58E-06	0.00	1.13E-04	0.00	7.06E-04	0.01
1962		20	9.54E-07	0.00	5.72E-06	0.00	9.06E-05	0.00	6.02E-04	0.01
1963		1	9.54E-07	0.00	3.81E-06	0.00	7.25E-05	0.00	5.10E-04	0.00
1964		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968		10	9.54E-07	0.00	9.54E-07	0.00	2.00E-05	0.00	2.08E-04	0.00
1969		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971		2	9.54E-07	0.00	9.54E-07	0.00	8.58E-06	0.00	1.13E-04	0.00
1972		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974		11	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00	5.72E-05	0.00
1975		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976		634	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	3.43E-05	0.02
1977		959	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.67E-05	0.03
1978		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979		253	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.53E-05	0.00
1980		704	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.14E-05	0.01
1981		35	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	8.58E-06	0.00
1982		434	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	5.72E-06	0.00
1983		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984		20	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00
1985		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986		187	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1987		352	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1988		278	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1989		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990		2	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1991		0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992		231	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
Total		4383	Total >	0.01	Total >	0.01	Total >	0.05	Total >	0.32

Yard Choice 5
 Row (1=bottom,2=top) 2
 InitialThickness (mils) 329 (mils)
 FailureLevel (mils) 250
 YardName C-745-K/L yards top row cylinders (4383 cylinders)
 YardLatMean 0.481
 YardLatSDDev 0.268
 ThcN 17
 alpha 0.95
 Yard Mean 1.673 (mils)
 Yard SDDev 0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 329.0 mils. Sample arith. mean,std.dev. are 1.67 and 0.45 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	1.75E-01	20.85	2.88E-01	34.21	5.93E-01	70.59	8.14E-01	96.83
1959	51	1.51E-01	7.69	2.58E-01	13.14	5.65E-01	28.81	7.97E-01	40.65
1960	69	1.28E-01	8.84	2.29E-01	15.79	5.36E-01	36.96	7.79E-01	53.76
1961	11	1.07E-01	1.18	2.01E-01	2.21	5.06E-01	5.56	7.60E-01	8.36
1962	20	8.87E-02	1.77	1.75E-01	3.50	4.75E-01	9.50	7.40E-01	14.80
1963	1	7.22E-02	0.07	1.51E-01	0.15	4.44E-01	0.44	7.18E-01	0.72
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	1.91E-02	0.19	5.77E-02	0.58	2.88E-01	2.88	5.93E-01	5.93
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	6.29E-03	0.01	2.61E-02	0.05	2.01E-01	0.40	5.06E-01	1.01
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.48E-03	0.02	9.41E-03	0.10	1.28E-01	1.41	4.12E-01	4.54
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	4.38E-04	0.28	4.05E-03	2.57	8.87E-02	56.25	3.49E-01	221.46
1977	959	2.17E-04	0.21	2.51E-03	2.40	7.22E-02	69.19	3.18E-01	305.09
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	4.19E-05	0.01	8.29E-04	0.21	4.52E-02	11.44	2.58E-01	65.19
1980	704	1.60E-05	0.01	4.38E-04	0.31	3.47E-02	24.45	2.29E-01	161.12
1981	35	5.41E-06	0.00	2.17E-04	0.01	2.61E-02	0.91	2.01E-01	7.05
1982	434	1.60E-06	0.00	9.95E-05	0.04	1.91E-02	8.29	1.75E-01	76.03
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	8.39E-08	0.00	1.6E-05	0.00	9.41E-03	0.19	1.28E-01	2.56
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	1.69E-09	0.00	1.6E-06	0.00	4.05E-03	0.76	8.87E-02	16.59
1987	352	1.45E-10	0.00	4.0E-07	0.00	2.51E-03	0.88	7.22E-02	25.40
1988	278	7.74E-12	0.00	8.39E-08	0.00	1.48E-03	0.41	5.77E-02	16.03
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	2.78E-15	0.00	1.6E-09	0.00	4.38E-04	0.00	3.47E-02	0.07
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	0.00E+00	0.00	7.74E-12	0.00	9.95E-05	0.02	1.91E-02	4.41
Total	4383	Total ->	41.13	Total ->	75.29	Total ->	329.35	Total ->	1127.60

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	3.50E-01	39.23	4.51E-01	53.71	7.38E-01	87.81	9.12E-01	108.56
1959	51	3.01E-01	15.33	4.20E-01	21.44	7.13E-01	36.37	9.01E-01	45.94
1960	69	2.72E-01	18.79	3.90E-01	26.90	6.87E-01	47.42	8.88E-01	61.27
1961	11	2.45E-01	2.69	3.59E-01	3.95	6.60E-01	7.26	8.74E-01	9.61
1962	20	2.19E-01	4.37	3.30E-01	6.59	6.32E-01	12.64	8.59E-01	17.17
1963	1	1.94E-01	0.19	3.01E-01	0.30	6.03E-01	0.60	8.42E-01	0.84
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	9.09E-02	0.91	1.70E-01	1.70	4.51E-01	4.51	7.38E-01	7.38
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	4.93E-02	0.10	1.08E-01	0.22	3.59E-01	0.72	6.60E-01	1.32
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	2.26E-02	0.25	6.15E-02	0.68	2.72E-01	2.99	5.74E-01	6.31
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	1.18E-02	7.49	3.88E-02	24.62	2.19E-01	138.64	5.13E-01	325.30
1977	959	8.15E-03	7.82	3.00E-02	28.73	1.94E-01	185.74	4.82E-01	462.50
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	3.44E-03	0.87	1.66E-02	4.19	1.48E-01	37.40	4.20E-01	106.38
1980	704	2.08E-03	1.46	1.18E-02	8.32	1.27E-01	89.56	3.90E-01	274.42
1981	35	1.19E-03	0.04	8.15E-03	0.29	1.08E-01	3.79	3.59E-01	12.58
1982	434	6.32E-04	0.27	5.41E-03	2.35	9.09E-02	39.45	3.30E-01	143.09
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	1.38E-04	0.00	2.08E-03	0.04	6.15E-02	1.23	2.72E-01	5.45
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	1.81E-05	0.00	6.32E-04	0.12	3.88E-02	7.26	2.19E-01	40.89
1987	352	4.77E-06	0.00	3.10E-04	0.11	3.00E-02	10.54	1.94E-01	68.17
1988	278	9.54E-07	0.00	1.38E-04	0.04	2.26E-02	6.28	1.70E-01	47.27
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.54E-07	0.00	1.81E-05	0.00	1.18E-02	0.02	1.27E-01	0.25
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	9.54E-07	0.00	5.41E-03	1.25	9.09E-02	21.00
Total	4383	Total ->	99.83	Total ->	184.30	Total ->	721.49	Total ->	1765.71

Yard Choice	5
Row (1=bottom,2=top)	2
Initial Thickness (mils)	345.5 (mils)
Failure Level (mils)	0
Yard Name	C-745-K/L yards top row cylinders (4383 cylinders)
Yard Lat Mean	0.481
Yard Lat Std Dev	0.288
The N	17
alpha	0.95
Yard Mean	1.873 (mils)
Yard Std Dev	0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)

Predicted number of cylinders with breaches during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 1.67 and 0.45 mils/yr.

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	6.15E-11	0.00	6.71E-10	0.00	6.96E-08	0.00	2.01E-06	0.00
1959	51	3.18E-11	0.00	3.82E-10	0.00	4.68E-08	0.00	1.50E-06	0.00
1960	69	1.60E-11	0.00	2.13E-10	0.00	3.11E-08	0.00	1.11E-06	0.00
1961	11	7.81E-12	0.00	1.16E-10	0.00	2.04E-08	0.00	8.12E-07	0.00
1962	20	3.69E-12	0.00	6.15E-11	0.00	1.31E-08	0.00	5.90E-07	0.00
1963	1	1.68E-12	0.00	3.18E-11	0.00	8.35E-09	0.00	4.24E-07	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1969	10	1.81E-14	0.00	7.41E-13	0.00	6.71E-10	0.00	6.96E-08	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1972	2	6.66E-16	0.00	4.92E-14	0.00	1.16E-10	0.00	2.04E-08	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1975	11	0.00E+00	0.00	2.11E-15	0.00	1.60E-11	0.00	5.22E-09	0.00
1976	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1977	634	0.00E+00	0.00	2.22E-16	0.00	3.69E-12	0.00	1.94E-09	0.00
1978	959	0.00E+00	0.00	0.00E+00	0.00	1.68E-12	0.00	1.15E-09	0.00
1979	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1980	253	0.00E+00	0.00	0.00E+00	0.00	3.14E-13	0.00	3.82E-10	0.00
1981	704	0.00E+00	0.00	0.00E+00	0.00	1.27E-13	0.00	2.13E-10	0.00
1982	35	0.00E+00	0.00	0.00E+00	0.00	4.92E-14	0.00	1.16E-10	0.00
1983	434	0.00E+00	0.00	0.00E+00	0.00	1.81E-14	0.00	6.15E-11	0.00
1984	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1985	20	0.00E+00	0.00	0.00E+00	0.00	2.11E-15	0.00	1.60E-11	0.00
1986	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1987	187	0.00E+00	0.00	0.00E+00	0.00	2.22E-16	0.00	3.69E-12	0.00
1988	352	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.68E-12	0.00
1989	278	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	7.41E-13	0.00
1990	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1991	2	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.27E-13	0.00
1992	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.81E-14	0.00
Total	4383	Total >	0.00	Total >	0.00	Total >	0.00	Total >	0.00

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	2.86E-06	0.00	1.14E-05	0.00	1.26E-04	0.01	7.10E-04	0.08
1959	51	1.91E-06	0.00	8.58E-06	0.00	1.02E-04	0.01	6.10E-04	0.03
1960	69	9.54E-07	0.00	5.72E-06	0.00	8.30E-05	0.01	5.22E-04	0.04
1961	11	9.54E-07	0.00	4.77E-06	0.00	6.68E-05	0.00	4.44E-04	0.00
1962	20	9.54E-07	0.00	2.86E-06	0.00	5.34E-05	0.00	3.77E-04	0.01
1963	1	9.54E-07	0.00	1.91E-06	0.00	4.20E-05	0.00	3.18E-04	0.00
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	9.54E-07	0.00	9.54E-07	0.00	1.14E-05	0.00	1.26E-04	0.00
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	9.54E-07	0.00	9.54E-07	0.00	4.77E-06	0.00	6.68E-05	0.00
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	3.34E-05	0.00
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.00E-05	0.01
1977	959	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	1.53E-05	0.01
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	8.58E-06	0.00
1980	704	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	5.72E-06	0.00
1981	35	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	4.77E-06	0.00
1982	434	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	2.86E-06	0.00
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1987	352	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1988	278	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00	9.54E-07	0.00
Total	4383	Total >	0.00	Total >	0.01	Total >	0.03	Total >	0.20

Yard Choice 5
Row (1=bottom,2=top) 2
Initial Thickness (mils) 345.5 (mils)
Failure Level (mils) 250
Yard Name C-745-K/L yards top row cylinders (4383 cylinders)
Yard Lab Mean 0.481
Yard Lab SD Dev 0.288
The N 17
alpha 0.95
Yard Mean 1.073 (mils)
Yard SD Dev 0.447 (mils)

C-745-K/L yards top row cylinders (4383 cylinders)

Predicted number of cylinders with minimum thickness of 250.0 mils or less during the period 1996-2020 for C-745-K/L yards top row cylinders (4383 cylinders), assuming initial thickness of 345.5 mils. Sample arith. mean, std. dev. are 1.07 and 0.45 mils/yr

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	5.04E-02	6.00	1.02E-01	12.19	3.19E-01	37.92	5.73E-01	68.20
1959	51	4.09E-02	2.08	8.73E-02	4.45	2.93E-01	14.95	5.49E-01	28.01
1960	69	3.27E-02	2.25	7.35E-02	5.07	2.68E-01	18.52	5.25E-01	36.21
1961	11	2.57E-02	0.28	6.13E-02	0.67	2.44E-01	2.69	5.00E-01	5.50
1962	20	1.99E-02	0.40	5.04E-02	1.01	2.21E-01	4.41	4.74E-01	9.49
1963	1	1.51E-02	0.02	4.09E-02	0.04	1.98E-01	0.20	4.49E-01	0.45
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	2.72E-03	0.03	1.12E-02	0.11	1.02E-01	1.02	3.19E-01	3.19
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	6.81E-04	0.00	4.04E-03	0.01	6.13E-02	0.12	2.44E-01	0.49
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	1.17E-04	0.00	1.12E-03	0.01	3.27E-02	0.36	1.77E-01	1.94
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	2.74E-05	0.02	3.97E-04	0.25	1.99E-02	12.61	1.37E-01	86.77
1977	959	1.19E-05	0.01	2.21E-04	0.21	1.51E-02	14.49	1.19E-01	114.08
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	1.74E-06	0.00	5.84E-05	0.01	8.19E-03	2.07	8.73E-02	22.08
1980	704	5.68E-07	0.00	2.74E-05	0.02	5.82E-03	4.10	7.35E-02	51.77
1981	35	1.64E-07	0.00	1.19E-05	0.00	4.04E-03	0.14	6.13E-02	2.14
1982	434	4.06E-08	0.00	4.77E-06	0.00	2.72E-03	1.18	5.04E-02	21.86
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	1.43E-09	0.00	5.68E-07	0.00	1.12E-03	0.02	3.27E-02	0.65
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	1.81E-11	0.00	4.06E-08	0.00	3.97E-04	0.07	1.99E-02	3.72
1987	352	1.18E-12	0.00	8.47E-09	0.00	2.21E-04	0.08	1.51E-02	5.32
1988	278	4.65E-14	0.00	1.43E-09	0.00	1.17E-04	0.03	1.12E-02	3.13
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	0.00E+00	0.00	1.81E-11	0.00	2.74E-05	0.00	5.82E-03	0.01
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	0.00E+00	0.00	4.65E-14	0.00	4.77E-06	0.00	2.72E-03	0.63
Total	4383	Total >	11.09	Total >	24.07	Total >	114.99	Total >	465.63

Upper 95% Confidence Limits

Manufacture Date	Number	1996		2000		2010		2020	
		Prob.	#	Prob.	#	Prob.	#	Prob.	#
1958	119	1.57E-01	18.72	2.38E-01	28.33	4.83E-01	57.45	7.20E-01	85.73
1959	51	1.40E-01	7.12	2.17E-01	11.04	4.57E-01	23.32	6.99E-01	35.66
1960	69	1.23E-01	8.48	1.96E-01	13.51	4.32E-01	29.78	6.77E-01	46.74
1961	11	1.07E-01	1.18	1.76E-01	1.94	4.06E-01	4.47	6.55E-01	7.20
1962	20	9.30E-02	1.86	1.57E-01	3.15	3.81E-01	7.62	6.32E-01	12.63
1963	1	7.98E-02	0.08	1.40E-01	0.14	3.56E-01	0.36	6.08E-01	0.61
1964	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1965	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1966	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1967	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1968	10	3.13E-02	0.31	6.78E-02	0.68	2.38E-01	2.38	4.83E-01	4.83
1969	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1970	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1971	2	1.49E-02	0.03	3.87E-02	0.08	1.76E-01	0.35	4.06E-01	0.81
1972	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1973	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1974	11	5.89E-03	0.06	1.95E-02	0.21	1.23E-01	1.35	3.31E-01	3.64
1975	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1976	634	2.75E-03	1.75	1.12E-02	7.11	9.30E-02	58.95	2.83E-01	179.69
1977	959	1.79E-03	1.71	8.23E-03	7.90	7.98E-02	76.52	2.60E-01	249.72
1978	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1979	253	6.59E-04	0.17	4.09E-03	1.04	5.69E-02	14.41	2.17E-01	54.78
1980	704	3.70E-04	0.26	2.75E-03	1.94	4.73E-02	33.28	1.96E-01	137.88
1981	35	1.95E-04	0.01	1.79E-03	0.06	3.87E-02	1.36	1.76E-01	6.16
1982	434	9.54E-05	0.04	1.11E-03	0.48	3.13E-02	13.58	1.57E-01	68.27
1983	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1984	20	1.72E-05	0.00	3.70E-04	0.01	1.95E-02	0.39	1.23E-01	2.46
1985	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1986	187	9.54E-07	0.00	9.54E-05	0.02	1.12E-02	2.10	9.30E-02	17.39
1987	352	9.54E-07	0.00	4.20E-05	0.01	8.23E-03	2.90	7.98E-02	28.08
1988	278	9.54E-07	0.00	1.72E-05	0.00	5.89E-03	1.64	6.78E-02	18.84
1989	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1990	2	9.54E-07	0.00	9.54E-07	0.00	2.75E-03	0.01	4.73E-02	0.09
1991	0	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00
1992	231	9.54E-07	0.00	9.54E-07	0.00	1.11E-03	0.26	3.13E-02	7.23
Total	4383	Total >	41.78	Total >	77.65	Total >	332.45	Total >	968.45

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