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This copy of the Validation Protocol / Report

ZTC-9, for version 5 of

"RELIABILITY PLOTTING"

was prepared and performed for use *only*** by

Your Name Here

Authorized by

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** Us
agree

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VALIDATION PROTOCOL # ZTC-9

For version 5 of

"RELIABILITY PLOTTING"

For the name and signat
see the cover-page of this co

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1.0 OBJECTIVE

This document outlines a validation protoc
Consulting & Publishing (ZTCP) as "Relia

2.0 SCOPE

This document applies to the MS Excel fil
named differently by purchasers of this file
"Instructions" worksheet inside the file wil

This document applies to all versions 5.XX
to minor variations in the program that are
improve the clarity of error messages. The
therefore re-validation is not required wher
required to a calculation cell, the new revis
revalidated.

The file is password protected on all calcul
accessible by user are the ones that allow i

By using the word "validation" in this prot
being validated. RP is a relatively simple "
which has been sold by Microsoft Corpora
to say that its functions and features will b
pre-determined design requirements and in
code-based add-ons (such as VBA scripts)
only standard Excel mathematical and stati
code to validate.

This validation protocol is designed to ens
the same as those outputted by other well-established statistical software programs and/or are the same
as those found in example calculations in published textbooks/articles (where "same" is defined by the

validation criterion). Such a process duplicate
statistical software programs -- for example:

1. The following text was found on A
   http://www.StatGraphics.com/val
   "*All StatGraphics analyses ar*
   more sources, including textbo
   calculations, and output from
2. The following text was found on A
   http://www.minitab.com/en-US/su
   "*All statistical and graphical c*
   one or more of the following n
   Validated by comparison to ot
   examples."

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3.0 POLICY and PURPOSE

Custom statistical software must be formally

The purpose of "Reliability Plotting" is to

- facilitate determination of product
- facilitate determination of distribu
  'normally' distributed?").

4.0 REFERENCES

Introduction to Statistical Analysis, 3rd ed., b
Book Co.

Statgraphics-Plus, v. 3, User Manual, 1997 b

Editorial Style Manual, *Section F: Determinc*
AMS Specifications, published by the Society
http://www.sae.org/technicalcommittees/part

Excel 2002 Formulas, by J. Walkenbach, 200

See Table 1, below, for additional references

5.0 DEFINITIONS

RP	The MSExcel file n PLOTTING".
SGP and SGC	SGP = StatGraphics to validate V

various versio
prior to this co
validation were
that were perfo
the report indic
validation/reva

SGC =

StatGraphicsC
StatGraphics th

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Reliability — The % of the populatio

Confidence — The probability (expre
correct.

"Same" — <u>Validation tests involv</u>

Some of the valid
that of another co
rounds values to a
own proprietary m
standard textbook
these 2 programs
"**same**" is defined
% of each other (i
range of 0.95 to 1

<u>Validation tests involv</u>

Some of the valid
version 3 (and hig
"**same**" is defined
each the outputs o
must equal 100.00

<u>Validation tests involv</u>

Some of the valid
hidden worksheet
Output and Repor
the output values
the other sheets (i
must equal 100.00

<u>Validation tests involv</u>

One of the validat
inputting a failure
reverse-transform
such tests, Excel i
because Excel can
Therefore, in this

failure rates
that is, 100%

"Identical" In the validation
The term "id
results that a
literally iden

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6.0 INSTALLATION VALIDATION

RP is a standard Microsoft Excel File, wit
function correctly, the file needs to be use
later), and one that is running MS Excel v

Installation validation is performed by ver
those versions of Excel (or their Apple-co
type of installation, this validation is self-
this protocol.

7.0 DESIGN VALIDATION

Design validation is first achieved by ensu
user modifiable.

Design validation is secondarily achieved
worksheets have been accurately entered,
references (see References in Table 1, bel
been correctly referenced by the respectiv

The equations used in RP are from multip
from their text-book appearance (that is, a
not be identical in appearance to the algeb
1 of this worksheet will involve having a
RP are accurate translations of the bullete
with version 2, the re-validation steps are
with version 3, the re-validation steps are
lookup bug-fix that applied only to the "C

8.0 PERFORMANCE VALIDATION

RP outputs a % reliability and correlation
transformed raw data. Performance valida
regression extrapolations to that of a com
StatGraphicsCenturion). Only the correlat
confidence limit) corresponding to inputte
The validation plan is described in greater

TABLE 1 --- REFERENCES

The primary reference is:

Applied Reliability, 2nd ed., by P. A. **Tobias** and D. C. Trinidade, 1995 by Chapman & Hall.

Other references include:

- **Alder**, H. L., and Roessler, E. B., *Introduction to Probability and Statistics*, 6th edition, 1977 byW. H. Freeman & Co.
- **Amstadter**, B. L., *Reliability Mathematics: Fundamentals, Practices, Procedures,*1971 by McGraw-Hill
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  Research Department U. S. Naval Ordnanc
  Publications, New York.
- **Crowder**, M. J., Kimber, A. C., Smith, R. L.,
  1991 by Chapman & Hall
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- **Moura**, E.. C., *How to Determine Sample S*
  Quality Press.
- **Natrella**, M. G., *Experimental Statistics: Na*
  Government Printing Office.
- **NIST**/*SEMATECH Engineering Statistics Int*
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- **Pyzdek**, T., and Berger, R. W., editors, *Qua*
  ASQC Quality Press
- **Shapiro**, *S. S., How to Test Normality...,* 19
- **Steel**, R. G. D., and Torrie, J. H., *Principles*
- **Thode,** H. C. Jr., *Testing For Normality*, 200
- **Walker**, H. M., *Elementary Statistical Metho*
- **Zylstra**, R. R., *Normality Tests for Small Sa*

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TABLE 2A --- PERFORMANCE VALIDATION PLAN <u>for Version 1.XX</u>

OUTPUT	VALIDATION PLAN For the features that were implemented in version 1.xx of RP	CRITERIA FOR SUCCESS
% Reliability and Product Failure Rates (the tests are briefly describe here to the right, and in more detail in Table 3 below)	Using data sets obtained from various distributions (e.g., Normal, Binomial, Uniform, etc.) using Excel's "Data Analysis, Random Number Generation" tool and other sources, compare the RP hidden-worksheet's mathematical output to that from SGP i extrapolations & correlations: • Each of the Y-axis transformation o • Each of the X-axis transformations v • Approximately half of the data will type • Approximately half of the "Specific data is considered "out of spec" if it will be such that <u>above</u> the spec is c • Approximately 1/3 of the data sets v values = 10, 1/3 = 100, and 1/3 = 2 • Approximately 1/3 of the confidenc 95%, and 1/3 99.9999% • Approximately half of the X-axis ex than all the raw-data points, and hal data points. • The X–A transformation will be use positive number larger than 1.0, onc than 1.0, and once with a negative n • Approximately half the analyses wil devices that were put on-test" equals and half will equal a minimum of 1 • LogLogistic will be tested at least 3 and twice with "interval" data where the very first observation, and the 2r cumulative failure rate of 50%. • Approximately 1/3 of the data sets v 1/3 greater than 1.0, and 1/3 spannin than 1.	RP must be able to plot the

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TABLE 2B --- DESIGN & PERFORMANCE VALIDATION PLAN <u>for Version 2.XX</u>

OUTPUT	VALIDATION PLAN For the changes that were implemented in version 2.xx of RP	CRITERIA FOR SUCCESS
% Reliability and Product Failure Rates (the tests are briefly describe here to the right, and in more detail in Table 3 below)	Version 2 of Reliability Plotting (RP) differs from version 1 only in the following ways: • The "X-squared" transformation was replaced by the Box-Cox transformation ((X^B – 1) / B, where B is any number except 0) • The "X-cubed" transformation was replaced by the Exponential transformation (X^C, where C is any number, except 0) To achieve these changes, the only calcula were 2 columns of 200 cells each, containi That is, the only calculation formula chang replace (in each of 200 contiguous cells in calculation sheet) " = X^2 " with " = (X^B – 1) / B " and then to replace (in each of 200 contigu the hidden calculation sheet) " = X^3 " with " = X^C " The 2 new formulas each have a variable (which is required to be entered by the user "input" a value for " B " and " C ", on the " worksheet, similar to what the user was re this program, for the input called " A ",. T reference the " B " and " C " cell on the Pr to obtain a value to use for B and C. VALIDATION PLANS: All that is being done in Version 2 is repla another. As part of the validation of Versi be visually examined and verified as havin as having referenced the correct "input" ce and every one of the 2 x 200 cells mention A variety of data sets above and below 1.0 validation. Each of those data sets will be variable (i.e., B or C, as appropriate) that i all cases, the output of RP will be compare the extrapolated values and correlation coe	RP must be able to plot the transformed data and to create a linear

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TABLE 2C --- DESIGN & PERFORMANCE VALIDATION PLAN <u>for Version 3.XX</u>

OUTPUT	VALIDATION PLAN **<u>For the changes that were implemented in version 3.xx</u> of RP**	CRITERIA FOR SUCCESS
% Reliability and Product Failure Rates	There were no changes to cells used to calculate linear regression or to extrapolate to specification limits or to reverse-transform to reliability/confidence points for RPv1 & RPv2 transformations. The only changes were the deletion or addition of transformations, as listed below: <u>Y-axis transformations</u>: • The "Proportional Odds" transformation was deleted, because it gave the identical results as the still-provided • The "LogLogistic" transformation was d difficult to use (clients had to pre-transfo • The "Cumulative Hazard #1" and "Cumu transformations were re-named "Exponer Hazard" respectively (no changes to any changes were based upon literature refer v2 were created. • The " T " distribution calculation was ch number of data points, to DF = 7, in an e • The "Chi-Square", "Laplace", & "Cauch <u>X-axis transformations</u>: • The Sqrt(X−A) transformation was chang new reference source. • The LN((1+X)/(1–X))(0.5) transformati "modification"only when raw data is >= was modified even if all raw data was < • The following new transformations were (X+1)Squared and (X+1)Cubed, Ln(X+S 1/(X+E), and Arcsin(Sqrt(X/(N+1)))+Ar Because all of the changes involve new or revise the changes implemented in RP v2), validation w 1. comparing the formulas for the new transfor textbooks 2. checking to ensure that when a user chooses transformations, the corresponding transform automaticly transferred to the section of the s regression and subsequent reliability calculat 3. checking to ensure that the reverse calculatio transformations (Laplace, Cauchy, and the "c are able to output the correct untransformed 4. comparing the "Output" of RP v3 to that of R sampling of transformation pairings that the common. Note: As part of the re-validation, steps 1 -- 4 ab possible transformations, not just the new ones.	1. The formulas for the transformations must match those in the

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TABLE 2D --- DESIGN & PERFORMANCE VALIDATION PLAN <u>for Version 4.XX</u>

OUTPUT	VALIDATION PLAN **<u>For the changes that were implemented in version 4.XX</u> of RP**	CRITERIA FOR SUCCESS
% Reliability and Product Failure Rates	In RPv4, there were no change RPv2, or RPv3 transformations in RPv4 is to correct an error i hidden worksheet that is refere appears in the Output table on is then referenced by the Comp The only mistaken result that t result of the "Laplace" transfor (Cauchy is the last transformat shown on the Preliminary Ana one just before it on the option worksheet in RPv3, the Cauch value; but due to a design error referenced by the Preliminary value and so reported the value Laplace value. As part of validation of RPv4, interval testing. Each such test "below" all the values of the da "above" all the data-set values. conditions, the "% below Spec worksheet will be compared to Analysis Output table and on b comparison will be done for al The Spec Limit, Confidence L testing will be chosen such tha for all 13 Y-axis transformatio lead to nonsense results, that is 100% --- in this testing, such exception is that it is mathemat transformation to calculate a re any of the data-set values; ther the "below" situation.	

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TABLE 2E --- DESIGN & PERFORMANCE VALIDATION PLAN <u>for Version 5.XX</u>

OUTPUT	VALIDATION PLAN **<u>For the changes that were implemented in version 5.XX</u> of RP**	CRITERIA FOR SUCCESS
Miscel-laneous	(1) (NOTE: The constants A, B, C, D, and E will be set equal to 2 exactly ... in RP4, that will be do ... will be done on the ... with data considered ... 95% confidence.) Using data set ... and either E or H (f ... RPv4. The comparis ... each available Y-ax ... that includes consta ... worksheet's "OUTP ... "%...above...specific ... in the Data Entry tal ... (a) in the exact sam ... (b) when the "Exac ... (not in numerica ... (2) For data sets A and ... Z... vs. X^B...), but ... values, order, and as ... coefficients in the P ... Table", for "numeric ... options choice is eit ... (a) "All possible Y- ... (b) "X-axis transfor ... (c) "X-axis transfor ... (d) "X(untransform ... (e) "Z(Normal distr ... (3) In RPv5, make seve ... constants A, B, C, D ... those constants on the Preliminary Analysis worksheet (note: all reliability and correlation coefficient calculations on the hidden calculation worksheet use the A, B, C, D, E values on the Preliminary Analysis worksheet [<u>not</u> those on the Solver worksheet], as has been the case in all previous versions of RP).	The OUTPUT ... must be ... (to the ... d # of ... es, ... nd ... ed ... mation ... must ... ical, ... mations ... that ... d to ... n RPv5 ... en "X- ... ormed" ... n in ... nly the ... ormed ... gned to ... n the ... e). ... es on ... worksheets must be identical.

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TABLE 3: EXPANDED DETAILS ON TESTING PROTOCOL FOR PERFORMANCE VALIDATION (PART 1 OF 5)

These tests were used in validation of RP version 1.XX and 2.XX, as ap

Test ID #	A	B	
Y-Trans	F untransformed	F untransformed	LN
X-trans	X untransformed)	1 / X	SQ
DataType	Exact	Interval	E
# of stress levels = N	10	100	2
Data Magnitude	< 1.00	> 1.00	0 <
Confidence	0.51	0.95	0.9
Chosen Point	Low end	High end	Lo
Out of Spec =	Below	Above	B
A, B, or C value	n/a	n/a	
Minimum Total # "On-test"	= N	= 10 x N	
Failure details	n/a	n/a	
Treatment level at which to calculate reliability =	0.01	3.1	0
Confidence level (1-sided) desired or required =	0.51	0.95	0.9
Total # of devices that were put on-test =	10	5080	2
" A " value (for "SQRT (X – A)" tranformation) =	n/a	n/a	
" B " value (for "(X^B – 1) / B" tranformation) =	n/a	n/a	
" C " value (for "X ^ C" tranformation) =	n/a	n/a	

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TABLE 3: EXPANDED DETAILS ON TESTING PROTOCOL F

These tests were used in validation of RP version 1.XX and 2.XX, as a

Test ID #	G	H	I
Y-Trans	CUMULATIVE HAZARD # 2	CUMULATIVE HAZARD # 1	WEIB (standard
X-trans	SQRT (X + 0.5)	SQRT (X) + SQRT (X + 1)	CUBE RO
DataType	Exact	Interval	Exac
# of stress levels = N	100	200	10
Data Magnitude	> 1.00	0 < X < 10	0 < X <
Confidence	0.95	0.999999	0.95
Chosen Point	Low end	High end	Low e
Out of Spec =	Below	Above	Belo
A, B, or C value	n/a	n/a	n/a
Minimum Total # "On-test"	= N	= 10 x N	= N
Failure details	n/a	n/a	n/a
Treatment level at which to calculate reliability =	2.1	9.1	0.11
Confidence level (1-sided) desired or required =	0.95	0.999999	0.95
Total # of devices that were put on-test =	100	5330	10
" A " value (for "SQRT (X – A)" tranformation) =	n/a	n/a	n/a
" B " value (for "(X^B – 1) / B" tranformation) =	n/a	n/a	n/a
" C " value (for "X ^ C" tranformation) =	n/a	n/a	n/a

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TABLE 3: EXPANDED DETAILS ON TESTING PROTOCOL FOR PERFORMANCE VALIDATION (PART 3 OF 5)

These tests were used in validation of RP version 1.XX and 2.XX, as applicable.

Test ID #	M	N	
Y-Trans	LOGLOGISTIC	LOGLOGISTIC	LA EXTRE
X-trans	CUBE ROOT (X)	ARCSIN (SQRT (X))	A (SQ
DataType	Exact	Interval	I
# of stress levels = N	100	100	
Data Magnitude	< 1.00	< 1.00	>
Confidence	0.51	0.999999	
Chosen Point	Low end	Low end	Hi
Out of Spec =	Below	Above	A
A, B, or C value	n/a	n/a	
Minimum Total # "On-test"	= 10 x N	= N	
Failure details	Total not more than 50% failed	1st observation = 50% of devices have failed	
Treatment level at which to calculate reliability =	0.005	1.1	
Confidence level (1-sided) desired or required =	0.51	0.999999	
Total # of devices that were put on-test =	1000	39600	4
" A " value (for "SQRT (X – A)" tranformation) =	n/a	n/a	
" B " value (for "(X^B – 1) / B" tranformation) =	n/a	n/a	
" C " value (for "X ^ C" tranformation) =	n/a	n/a	

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TABLE 3: EXPANDED DETAILS ON TESTING PROTOCO **5)**

These tests were used in validation of RP version 1.XX and 2.XX,

Test ID #	S	T	
Y-Trans	Z (F)	Ln (F	L ed)
X-trans	(X^B – 1) / B	X ^ C	
DataType	Exact	Interva	
# of stress levels = N	10	100	
Data Magnitude	0 < X < 10	> 1.0	0
Confidence	0.95	0.9999	
Chosen Point	Low end	High e	
Out of Spec =	Below	Above	
A, B, C, or D value	B > 10	C < –	
Minimum Total # "On-test"	= N	= 10 x	
Failure details	n/a	n/a	
Treatment level at which to calculate reliability =	0.11	0.99	
Confidence level (1-sided) desired or required =	0.95	0.9999	
Total # of devices that were put on-test =	10	5100	
" A " value (for "SQRT (X – A)" transformation) =	n/a	n/a	
" B " value (for "(X^B – 1) / B" transformation) =	11	n/a	
" C " value (for "X ^ C" transformation) =	n/a	-11	

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VALIDATION REPORT for Protocol # ZTC-9

For version 5 of

"RELIABILITY PLOTTING"

For the name and signature of the author of this Report, see the cover-page of this combined Protocol + Report PDF file.

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1.0 INSTALLATION VALIDAT

Self-evident -- see Protocol for

2.0 DESIGN VALIDATION

All the equations on the hidden ... e source articles.

All the references were found t ... heets.

The only user-modifiable cells ... e ones for inputting user's document c

The equations for the data trans ... correctly translated/constructed in Excel, ... ed by an independent mathematician cor ... ata was automaticly copied to the corre appropriate for the transformati ... lists on the "Preliminary Analysis" wor ... ent #1).

3.0 PERFORMANCE VALIDAT

The text of the leftmost and cer ... tocol #ZTC-9, with minor changes fo

RP VERSION 1 VALIDATION PLAN DETAILS	CRITERIA FOR SUCCESS	RESULTS
Using data sets obtained from various dis Binomial, Uniform, etc.) using Excel's "D Number Generation" tool , compare the R mathematical output to that from SGP in regression extrapolations & correlations: • Each of the Y-axis transformation opt once • Each of the X-axis transformations wi • Approximately half of the data will be "interval" type • Approximately half of the "Specificat that data is considered "out of spec" if limit, and half will be such that above "out of spec". • Approximately 1/3 of the data sets wi data sets = 10, 1/3 = 100, and 1/3 = 2 • Approximately 1/3 of the confidence 51%, 1/3 95%, and 1/3 99.9999% • Approximately half of the X-axis extr larger than all the raw-data points, and than all the raw data points. • The X-A transformation will be used with A = positive number larger than positive number less than 1.0, and one number. • Approximately half the analyses will devices that were put on-test" equals t observed, and half will equal 10 times • LogLogistic will be tested at least 3 ti data; and twice with "interval" data w 50% failure in the very first observati a maximum observed cumulative failu • Approximately 1/3 the data sets will h 1.00, 1/3 greater than 1.0, and 1/3 spa to greater than 1.		

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RP VERSION 2 **VALIDATION PLAN DETAILS**	**CRITERIA FOR SUCCESS**	**RESULTS**
Version 2 of Reliability Plotting (RP) c in the following ways: • The "X-squared" transformatio Cox transformation ((X^B – 1) number except 0) • The "X-cubed" transformation Exponential transformation (X except 0). To achieve these changes, the only cal changed were 2 columns of 200 cells e original formulas. That is, the only cal made in Version 2 were to replace (in e cells in a single column on the hidden c " = X^2 " with " = (X^B – 1) / and then to replace (in each of 200 con column on the hidden calculation sheet " = X^3 " with " = X^C " The 2 new formulas each have a variab respectively) which is required to be en program. The user must "input" a value "Preliminary Analysis" worksheet, sim required to do in Version 1 of this prog A ",. The formulas shown above refere on the Preliminary Analysis worksheet for B and C. VALIDATION PLANS: All that is being done in Version 2 is re another. The formulas (above) will be verified as having been entered correct referenced the correct "input" cell men every one of the 2 x 200 cells mentione A variety of data sets above and below validation. Each of those data sets will input variable (i.e., B or C, as appropri or positive. In all cases, the output of RP will be compared to that of SGP, in regards to the extrapolated values and correlation coefficients.		

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RP VERSION 3 **VALIDATION PLAN DETAILS**	**CRITERIA FOR SUCCESS**	**RESULTS**
Per the Protocol for RP v3, this re-validation in steps 1 − 4, below, for all possible transformati ones. 1. Compare the formulas for all transformatio source textbooks. 2. Determine whether or not, when a user choo transformations, the corresponding transfor actually the ones automaticly transferred to spreadsheet where linear regression and sub calculation occur. 3. Determining whether or not the reverse calc axis transformations are able to output the c untransformed value. 4. Compare the output of RP v3 to that of RP a sampling of transformation pairings that t have in common.		RPv2.

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RP VERSION 4 **VALIDATION PLAN DETAILS**	**CRITERIA FOR SUCCESS**	**RESULTS**
Exact data, with specification "below" all values in		
Exact data, with specification "above" all values in		
Interval data, with specification "below" all values i		
Interval data, with specification "above" all values i		
Exact Data Set = 10, 11, 12, 13, with N=5, Con Spec Limits of 9.9999 and 13.0001 for the "bel specification" and "above the specification limi respectively.		
Interval Data Set = 10, 11, 12, 13, with Quantit those values, with N=50, Confidence = 95%, ar 9.9999 and 13.0001 for the "below the specifica the specification limit" testing, respectively.		

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RP VERSION 5 **VALIDATION PLAN DETAILS**	**CRITERIA FOR SUCCESS**	**RESULTS**
(1) (NOTE: The constants A, B, C, D, and E will be set equal to 2 exactly --- in RP4, that will be done on the Pre worksheet; in RP5, that will be done on the So Specification limit will be 0.5, with data consi if it is below than the spec limit, and 95% conf Using data sets A and either D or W (fou 3a), and C and either E or H (found on Attach output of RPv5 and RPv4. The comparison wi transformation pairing for each available Y-ax at least one of the X-axis options that includes or E. Compare Preliminary Analysis workshe Correlation Coefficient and "%...above...specif RPv4 and RPv5 have the same data in the Data (a) in the exact same numerical order (i.e., sm (b) when the "Exact" data has been entered to order (not in numerical order). (2) For data sets A and C, using an arbitrarily chos pairing (e.g., Z... vs. X^B...), but with all other (1) above, compare the values, order, and asso pairings of the correlation coefficients in the P "Suggested Transformation-Pairings Table", fo and "randomized" data, when the display-optic (a) "All possible Y-axis and X-axis transforma (b) "X-axis transformations that include A, B, (c) "X-axis transformations that do NOT inclu (d) "X(untransformed), only" (e) "Z(Normal distribution) transformation, or (3) In RPv5, make several different entries to the S for constants A, B, C, D, and E cells, and comp displayed for those constants on the Preliminar (note: all reliability and correlation coefficient hidden calculation worksheet use the A, B, C, Preliminary Analysis worksheet [not those on as has been the case in all previous versions of RP).	The OUTPUT	

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4.0 CONCLUSION

5.0

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- Attachment #2: Mathematical Results Summary for Validation Tests **a** thru **w**, for v.2.XX
- Attachment #3a and 3b: Input Data for Validation Tests **a** thru **w**, for v.2.XX etc.
- Attachment #4a: Results Summary of the re-validation performed for v.3.XX
- Attachment #4b: Detailed Results for item #'s 3 & 4 (from Attachment # 4a), for v.3.XX
- Attachment # 4c: Detailed Results of the revalidation performed for version v.4.XX.
- Attachment # 5: Detailed Results of the revalidation performed for version v.5.XX.

Summers Consulting

Livermore, CA 94550

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February 11, 2004

REPORT ON EVALUAT
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Person who performed th

Qualifications of person v
- B.A. Chemistry, B.A. E
  programming, and
- 16 years experience in
  management), inclu
- Extensive experience u
  control, process val
- Industry coursework in
  validation, spreadsh
  programming), and
- Six years coaching MA
  running the progra

Methods used to perform
- Parsed all transformati
- Parsed all transformati
- Tested transformation f
  are accurate
- Tested transformation i
  All correct
- Tested graphing data fo
  graph correctly
- Tested effects of the op

Summers Consulting. Evaluatio

Tested linearization capabil
Spreadsheet appears ca

Results of evaluation:
Errors and bugs found:

Summary statement of evalu
Spreadsheet works corr

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Regards,

Ken Summers,
President, Summers Consulting

ATTACHMENT # 2, for ZTC Protocol Report #9, for RP v.2.xx

RESULTS SUMMARY

	INPUT	OUTPUT	OUTPUT	RATIO	OUTPUT	OUTPUT	RATIO	CONCLUSION
		Extrapolated Value (at Confidence Level)			Correlation Coefficient (absolute value)			
Test Results	**Test ID (see Protocol)**	**RP**	**SGP**	**RP output as a % of SGP**	**RP**	**SGP**	**RP output as a % of SGP**	**Outputs are the "same"?**
	A	-0.091221945	-0.0912218	100.00%	0.944747792	0.944748	100.00%	**YES**
	B	0.108643139	0.107513	101.05%	0.922478826	0.922479	100.00%	**YES**
	C	-5.133810875	-5.13569	99.96%	0.957615516	0.957616	100.00%	**YES**
	D	-0.870315941	-0.870316	100.00%	0.854060723	0.854061	100.00%	**YES**
	E	-2.872577207	-2.87258	100.00%	0.978220536	0.978221	100.00%	**YES**
	F	0.981424274	0.981423	100.00%	0.754281136	0.754281	100.00%	**YES**
	G	-1.777231814	-1.77723	100.00%	0.853634799	0.853635	100.00%	**YES**
	H	0.385265106	0.385579	99.92%	0.872163945	0.872164	100.00%	**YES**
	I	-2.535812319	-2.53581	100.00%	0.910534794	0.910535	100.00%	**YES**
	J	0.102160258	0.10216	100.00%	0.862101708	0.862102	100.00%	**YES**
	K	-1.750434707	-1.75043	100.00%	0.814142276	0.814142	100.00%	**YES**
	L	-59.47147951	-60.2165	98.76%	0.787312327	0.787312	100.00%	**YES**
	M	-4.979142009	-4.97914	100.00%	0.982711168	0.982711	100.00%	**YES**
	N	0.256740169	0.26421	97.17%	0.572780043	0.57278	100.00%	**YES**
	O	4.317156415	4.31716	100.00%	0.482973098	0.482973	100.00%	**YES**
	P	-2.996159842	-2.99617	100.00%	0.867491735	0.867492	100.00%	**YES**
	Q	0.482168225	0.482168	100.00%	0.679772468	0.679772	100.00%	**YES**
	R	-5.328221118	-5.32822	100.00%	0.885968756	0.885969	100.00%	**YES**
	S	-0.755769181	-0.755769	100.00%	0.969606912	0.969607	100.00%	**YES**
	T	-12.18160004	-12.1775	100.03%	0.872453658	0.872454	100.00%	**YES**
	U	0.266662055	0.267375	99.73%	0.968789675	0.96879	100.00%	**YES**
	V	-3.618320022	-3.61832	100.00%	0.935384627	0.935385	100.00%	**YES**
	W	-1.345257234	-1.34526	100.00%	0.689927693	0.689927	100.00%	**YES**

ATTACHMENT # 3a , for ZTC Protocol Report #9, for RP v.2.xx

RAW DATA (10 and 100 POINT DATA SETS)

DATA USED FOR TESTS

Test ID #	A	D		F		I	L		S and W
(n = 10)			Quantity		Quantity			Quantity	
	0.015472884	0.176334937	1	0.751244455	0	0.217963435	0.506143015	2	0.1
	0.398632771	0.461466813	1	3.961206213	2	3.714997653	4.027903882	4	6
	0.402874844	0.463112941	2	3.966498558	0	3.739222294	4.033192878	8	7
	0.405377361	0.464082065	2	3.986380163	0	3.772772041	4.034304003	16	8
	0.551316874	0.519348363	2	4.88384304	2	4.797063839	6.03679698	32	8.2
	0.58067568	0.530543333	2	4.958842198	2	4.927191379	6.066841521	64	8.7
	0.659932249	0.561841774	2	4.986282574	0	5.90925074	7.005613776	128	8.9
	0.681783502	0.570903752	3	5.674670934	2	6.666675013	7.081026733	256	9.05
	0.790307321	0.621123207	3	5.898792901	2	7.724359166	9.041182617	512	9.2
	0.860316782	0.662261586	3	6.778051986	3	7.988746965	9.506709123	1024	9.4

Test ID #	B and T		G	J		M	N and P	
(n = 100)		Quantity			Quantity			Quantity
	1.008301035	2	2.813827703	0.140691385	0	0.008301035	0.102537107	19800
	1.015472884	2	3.526698745	0.176334937	1	0.015472884	0.104683234	102
	1.028748436	0	4.301451807	0.21507259	1	0.028748436	0.110890077	104
	1.042909024	0	4.846357367	0.242317868	1	0.042909024	0.116567669	106
	1.061891537	2	5.382736415	0.269136821	1	0.061891537	0.124200239	108
	1.073580126	2	5.651096469	0.282554823	1	0.073580126	0.134925325	110
	1.08087405	0	5.802349986	0.290117499	1	0.08087405	0.138461798	112
	1.084047975	2	5.864955054	0.293247753	1	0.084047975	0.14380373	114
	1.09418012	3	6.053663835	0.302683192	1	0.09418012	0.151502417	116
	1.099642933	3	6.149235812	0.307461791	1	0.099642933	0.154120442	118
	1.115237892	1	6.402596025	0.320129801	1	0.115237892	0.162845315	120
	1.125431074	3	6.555227426	0.327761371	1	0.125431074	0.170067542	122
	1.1507004	3	6.899698544	0.344984927	1	0.1507004	0.182030122	124
	1.162205878	3	7.043701114	0.352185056	1	0.162205878	0.18564952	126
	1.181890316	1	7.275444912	0.363772246	1	0.181890316	0.19521328	128
	1.200476089	3	7.480234697	0.374011735	1	0.200476089	0.211551736	130
	1.216437269	3	7.647153123	0.382357656	2	0.216437269	0.228332676	132
	1.22257149	1	7.709389845	0.385469492	2	0.22257149	0.236165256	134
	1.234931486	4	7.83189196	0.391594598	2	0.234931486	0.255059584	136
	1.235572375	2	7.83814701	0.391907351	2	0.235572375	0.255068369	138
	1.246253853	2	7.941024503	0.397051225	2	0.246253853	0.263089876	140
	1.258644368	2	8.057407993	0.4028704	2	0.258644368	0.269997108	142
	1.260628071	2	8.075770691	0.403788535	2	0.260628071	0.272006987	144
	1.264229255	2	8.108918362	0.405445918	2	0.264229255	0.275220831	146
	1.2760094	2	8.215789674	0.410789484	2	0.2760094	0.284566162	148
	1.281868954	4	8.268104946	0.413405247	2	0.281868954	0.286962463	150
	1.288003174	2	8.322316515	0.416115826	2	0.288003174	0.29265525	152
	1.297860652	4	8.408311512	0.420415576	2	0.297860652	0.295275002	154

1.298776208	4	8.416230937	0.420811547	2	0.298776208	0.296424783	156
1.306558428	4	8.483112904	0.424155645	2	0.306558428	0.300322915	158
1.312967315	2	8.537628016	0.426881401	2	0.312967315	0.305782003	160
1.322580645	4	8.618513928	0.430925696	2	0.322580645	0.315593601	162
1.328562273	4	8.668339458	0.433416973	2	0.328562273	0.32449493	164
1.329691458	4	8.677701569	0.433885078	2	0.329691458	0.32474208	166
1.343302713	4	8.789603524	0.439480176	2	0.343302713	0.336079649	168
1.350291452	2	8.84639692	0.442319846	2	0.350291452	0.34713332	170
1.357158116	3	8.901802201	0.44509011	2	0.357158116	0.353604708	172
1.370708335	3	9.010065039	0.450503252	2	0.370708335	0.368726822	174
1.371227149	5	9.01418505	0.450709253	2	0.371227149	0.369819115	176
1.384899442	3	9.122086365	0.456104318	2	0.384899442	0.37801686	178
1.388439589	5	9.149835048	0.457491752	2	0.388439589	0.383980814	180
1.398632771	5	9.229336254	0.461466813	2	0.398632771	0.394404032	182
1.402874844	5	9.262258825	0.463112941	2	0.402874844	0.401583059	184
1.405377361	5	9.281641294	0.464082065	2	0.405377361	0.403315228	186
1.412915433	5	9.339843271	0.466992164	2	0.412915433	0.411841306	188
1.430829798	3	9.477215624	0.473860781	2	0.430829798	0.43166168	190
1.437635426	3	9.529097749	0.476454887	2	0.437635426	0.439132945	192
1.467543565	6	9.755664248	0.487783212	3	0.467543565	0.467548007	194
1.473738823	4	9.802375896	0.490118795	3	0.473738823	0.4730769	196
1.486953337	4	9.90187348	0.495093674	3	0.486953337	0.475261588	198
1.490340892	6	9.927357521	0.496367876	3	0.490340892	0.479091076	200
1.505569628	4	10.04188223	0.502094112	3	0.505569628	0.498653934	202
1.5114597	4	10.08618599	0.5043093	3	0.5114597	0.503291193	204
1.511825922	6	10.08894176	0.504447088	3	0.511825922	0.50627592	206
1.528031251	6	10.21096639	0.51054832	3	0.528031251	0.519018901	208
1.530808435	4	10.23190751	0.511595375	3	0.530808435	0.523339781	210
1.536912137	4	10.27797114	0.513898557	3	0.536912137	0.526492707	212
1.544267098	6	10.33357082	0.516678541	3	0.544267098	0.543644832	214
1.551316874	7	10.38696726	0.519348363	3	0.551316874	0.553373189	216
1.554338206	7	10.40988652	0.520494326	3	0.554338206	0.556498468	218
1.564622944	5	10.48810193	0.524405097	3	0.564622944	0.558419682	220
1.567217017	5	10.50788003	0.525394002	3	0.567217017	0.560255657	222
1.571642201	5	10.5416689	0.527083445	3	0.571642201	0.56663174	224
1.58067568	5	10.61086666	0.530543333	3	0.58067568	0.571415148	226
1.581316568	5	10.61578817	0.530789408	3	0.581316568	0.571933523	228
1.583605457	7	10.63337666	0.531668833	3	0.583605457	0.575235278	230
1.595995972	5	10.72898956	0.536449478	3	0.595995972	0.586515983	232
1.60298471	7	10.78324206	0.539162103	3	0.60298471	0.592161219	234
1.659932249	8	11.23683549	0.561841774	4	0.659932249	0.665064762	236
1.681783502	6	11.41807504	0.570903752	4	0.681783502	0.689341644	238
1.702139348	8	11.59168849	0.579584424	4	0.702139348	0.703930188	240
1.70393994	6	11.60729883	0.580364941	4	0.70393994	0.704437888	242
1.720084231	6	11.7492755	0.587463775	4	0.720084231	0.727762602	244
1.721823786	8	11.76480398	0.588240199	4	0.721823786	0.730069524	246
1.722098453	8	11.76725962	0.588362981	4	0.722098453	0.730160292	248
1.73259682	6	11.86205739	0.593102869	4	0.73259682	0.741475684	250
1.739097262	6	11.92169182	0.596084591	4	0.739097262	0.745635303	252

1.743522446	8	11.96272822	0.598136411	4	0.743522446	0.747878003	254
1.752220222	9	12.04448042	0.602224021	4	0.752220222	0.754612116	256
1.753563036	7	12.05723609	0.602861804	4	0.753563036	0.755619026	258
1.755149998	9	12.07235871	0.603617936	4	0.755149998	0.756017593	260
1.756736961	7	12.0875359	0.604376795	4	0.756736961	0.756426909	262
1.757103183	7	12.09104201	0.6045521	4	0.757103183	0.757351009	264
1.75942259	9	12.11334054	0.605667027	4	0.75942259	0.762726528	266
1.782891324	7	12.34598474	0.617299237	4	0.782891324	0.792964196	268
1.782982879	9	12.34691925	0.617345962	4	0.782982879	0.793188275	270
1.790307321	9	12.42246415	0.621123207	4	0.790307321	0.798435493	272
1.804437391	9	12.57273541	0.628636771	5	0.804437391	0.812352171	274
1.811609241	7	12.65152721	0.632576361	5	0.811609241	0.819448064	276
1.834101382	7	12.91149718	0.645574859	5	0.834101382	0.836611352	278
1.844325083	9	13.0371848	0.65185924	5	0.844325083	0.845767513	280
1.85647145	10	13.19379978	0.659689989	5	0.85647145	0.85319404	282
1.860316782	10	13.24523171	0.662261586	5	0.860316782	0.857924573	284
1.867702261	8	13.34678589	0.667339294	5	0.867702261	0.86747071	286
1.890224921	10	13.68318069	0.684159035	5	0.890224921	0.887733873	288
1.890652181	10	13.69001555	0.684500777	5	0.890652181	0.88823942	290
1.895138401	8	13.76298203	0.688149102	5	0.895138401	0.888554289	292
1.911832026	10	14.05636911	0.702818455	5	0.911832026	0.912693737	294
1.966948454	11	15.51317498	0.775658749	6	0.966948454	0.965462396	296
1.996795557	11	18.17824912	0.908912456	8	0.996795557	0.996443241	298

ATTACHMENT # 3b, for ZTC Protocol Report #9, for RP v.2.xx

RAW DATA (200 POINT DATA SETS)

DATA USED FOR TESTS

Test ID #	C and V	E	H		K	O		R	Q		U	
(n = 200)				Quantity			Quantity					
	0.237200937	1.00265511	0.17774131	1	1.637305357	1.637305357	1	1.331827637	12.838	1	0.177741	1
	0.686366768	1.00408948	0.186079796	1	2.066223058	2.066223058	3	1.56993748	15.04664418	3	0.18608	1
	0.710146779	1.006164739	0.190733049	1	2.492303136	2.492303136	5	1.73352739	16.3386182	6	0.190733	1
	0.715117294	1.006775109	0.193671733	0	2.593038769	2.593038769	7	2.089930848	17.25528835	8	0.193672	0
	0.751244455	1.007721183	0.198848676	1	2.734483385	2.734483385	9	2.106287438	17.96631296	10	0.198849	1
	0.828416834	1.008301035	0.212411517	1	2.813827703	2.813827703	11	2.164191231	18.54726237	11	0.212412	1
	0.832265253	1.011993774	0.213516075	1	3.22801159	3.22801159	13	2.274151347	19.0384481	14	0.213516	1
	0.869739308	1.013214515	0.218732736	1	3.340479705	3.340479705	15	2.299769098	19.46393253	14	0.218733	1
	0.93110333	1.013428144	0.228490287	1	3.359197106	3.359197106	17	2.30786978	19.83923639	14	0.22849	1
	0.933568858	1.014191107	0.23345937	1	3.424135027	3.424135027	19	2.353189641	20.17495714	16	0.233459	1
	0.946102885	1.015472884	0.237584511	1	3.526698745	3.526698745	21	2.46170712	20.4786535	19	0.237585	1
	0.966885649	1.017914365	0.24291705	1	3.70342266	3.70342266	23	2.520675505	20.75590655	22	0.242917	1
	1.669629204	1.018097476	0.253871873	2	3.715809978	3.715809978	25	2.545649295	21.01095463	24	0.253872	2
	1.672770623	1.020386364	0.258486071	2	3.862493284	3.862493284	27	2.623467526	21.24709228	26	0.258486	2
	1.678244632	1.02047792	0.263170594	2	3.868059391	3.868059391	29	2.649317389	21.46693116	26	0.263171	2
	1.679836357	1.020599994	0.264120212	2	3.875480868	3.875480868	31	2.672854671	21.6725767	28	0.26412	2
	1.68527962	1.02130192	0.281644365	2	3.917281245	3.917281245	33	2.692228458	21.865751	28	0.281644	2
	1.689817648	1.021454512	0.297112085	1	3.926230673	3.926230673	35	2.694769376	22.04788057	31	0.297112	1
	1.699740718	1.021851253	0.29914591	1	3.949204509	3.949204509	37	2.697667462	22.22016036	32	0.299146	1
	1.708838971	1.022186956	0.30079496	2	3.968385752	3.968385752	39	2.707943657	22.38360132	33	0.300795	2
	1.714257704	1.022888882	0.305085614	2	4.007703208	4.007703208	41	2.708117733	22.5390663	36	0.305086	2
	1.724408395	1.023377178	0.311284988	2	4.034442352	4.034442352	43	2.72619732	22.68729767	37	0.311285	2
	1.727093255	1.028748436	0.318598455	2	4.301451807	4.301451807	45	2.726459008	22.82893877	39	0.318598	2
	1.750718882	1.029236732	0.33025323	2	4.323607098	4.323607098	47	2.72886422	22.96455073	40	0.330253	2
	1.754672251	1.030274361	0.342650002	2	4.369663909	4.369663909	49	2.734935267	23.09462593	40	0.34265	2
	1.758548338	1.033082064	0.344512678	3	4.488080119	4.488080119	51	2.740903314	23.21959881	42	0.344513	3
	1.761320817	1.034455397	0.361305525	1	4.542990862	4.542990862	53	2.749240216	23.33985459	45	0.361306	1
	1.777097163	1.035309915	0.373255667	3	4.576264726	4.576264726	55	2.75662381	23.45573645	46	0.373256	3
	1.781130657	1.03582873	0.401351006	2	4.59612809	4.59612809	57	2.758569885	23.56755143	46	0.401351	2
	1.793375165	1.036713767	0.40508111	2	4.629511093	4.629511093	59	2.760355257	23.67557534	49	0.405081	2
	1.794029925	1.038300729	0.410750145	1	4.687736944	4.687736944	61	2.764190554	23.78005683	52	0.41075	1
	1.805256178	1.040162358	0.419474262	3	4.753588908	4.753588908	63	2.767574004	23.88122088	55	0.419474	3
	1.805641064	1.040986358	0.430813589	3	4.781937858	4.781937858	65	2.785238544	23.97927169	55	0.430814	3
	1.807120772	1.042909024	0.433180189	3	4.846357367	4.846357367	67	2.787159837	24.07439518	56	0.43318	3
	1.808484117	1.044068728	0.439326966	2	4.884092303	4.884092303	69	2.802875047	24.16676106	57	0.439327	2
	1.813610182	1.044953764	0.439943261	2	4.912345755	4.912345755	71	2.804019529	24.25652475	60	0.439943	2
	1.814774779	1.046235542	0.447743448	2	4.952495399	4.952495399	73	2.831201776	24.34382884	62	0.447743	2
	1.815642316	1.046296579	0.452800415	1	4.954378053	4.954378053	75	2.838364358	24.42880454	63	0.4528	1
	1.818540784	1.046906949	0.46082562	3	4.973163666	4.973163666	77	2.8465055	24.51157283	65	0.460826	3
	1.820650684	1.047273171	0.462032416	1	4.984336809	4.984336809	79	2.846855833	24.59224549	67	0.462032	1
	1.831278884	1.048371838	0.466121762	2	5.017460606	5.017460606	81	2.85588529	24.67092603	68	0.466122	2

1.833619339	1.050752281	0.470088441	2	5.087187017	5.087187017	83	2.858432969	24.74771047	69	0.470088	2
1.844798828	1.050996429	0.472634453	2	5.094199221	5.094199221	85	2.85875055	24.82268805	70	0.472634	2
1.848046831	1.053529466	0.473723204	2	5.165344444	5.165344444	87	2.8858977	24.89594185	72	0.473723	2
1.848334752	1.053895688	0.476689574	3	5.175398908	5.175398908	89	2.890454727	24.96754936	74	0.47669	3
1.852870804	1.054567095	0.486968204	2	5.193707036	5.193707036	91	2.903293578	25.03758295	75	0.486968	2
1.859907005	1.061891537	0.667052893	2	5.382736415	5.382736415	93	2.916937057	25.10611032	76	0.667053	2
1.861016916	1.065340129	0.672415966	3	5.465723259	5.465723259	95	2.927350179	25.1731949	77	0.672416	3
1.866764177	1.068300424	0.6735689	1	5.534290065	5.534290065	97	2.932242699	25.2388962	78	0.673569	1
1.874423855	1.068544572	0.676451005	1	5.53984253	5.53984253	99	2.94137283	25.3032701	81	0.676451	1
1.883844214	1.068697165	0.676748604	2	5.543307705	5.543307705	101	2.942553438	25.3663692	81	0.676749	2
1.895055183	1.06961272	0.68054002	1	5.563948687	5.563948687	103	2.9441381	25.42824298	82	0.68054	1
1.900491872	1.06961272	0.681184005	2	5.563948687	5.563948687	105	2.950964717	25.48893815	82	0.681184	2
1.917002764	1.069795831	0.681941015	3	5.568055056	5.568055056	107	2.952264848	25.54849877	84	0.681941	3
1.92042988	1.070253609	0.683815188	2	5.578286871	5.578286871	109	2.957708083	25.60696646	84	0.683815	2
1.928258613	1.070528275	0.684188406	2	5.584398675	5.584398675	111	2.960859375	25.66438063	87	0.684188	2
1.928262964	1.072054201	0.684861719	2	5.6180136	5.6180136	113	2.963761413	25.72077856	89	0.684862	2
1.929241151	1.072206793	0.69130502	2	5.62134235	5.62134235	115	2.965062322	25.77619561	92	0.691305	2
1.933903838	1.072817164	0.692361916	2	5.634616425	5.634616425	117	2.966540987	25.83066531	92	0.692362	2
1.936936546	1.073427534	0.697758017	2	5.647808646	5.647808646	119	2.969406117	25.88421951	92	0.697758	2
1.937215227	1.073580126	0.698009226	2	5.651096469	5.651096469	121	2.974133063	25.93688848	93	0.698009	2
1.942888508	1.074068422	0.703070781	2	5.661567027	5.661567027	123	2.9801364	25.988701	93	0.703071	2
1.946220047	1.07412946	0.703254622	2	5.662869878	5.662869878	125	2.983841648	26.03968449	94	0.703255	2
1.953476983	1.075838496	0.704262595	2	5.699104147	5.699104147	127	2.993103526	26.08986506	95	0.704263	2
1.956830391	1.078096866	0.705320403	2	5.746034074	5.746034074	129	3.00851124	26.1392676	97	0.70532	2
1.959262291	1.078646199	0.706013079	2	5.757289071	5.757289071	131	3.013935267	26.18791587	98	0.706013	2
1.961557969	1.079744865	0.706808008	2	5.779635356	5.779635356	133	3.01764273	26.23583256	100	0.706808	2
1.964822193	1.080355235	0.70890484	2	5.791940819	5.791940819	135	3.018383841	26.28303935	101	0.708905	2
1.965586319	1.08087405	0.709933023	2	5.802349986	5.802349986	137	3.01997667	26.32955697	102	0.709933	2
1.968542872	1.080904569	0.711356106	2	5.802963895	5.802963895	139	3.045244412	26.37540524	103	0.711356	2
1.986285971	1.083254494	0.713697464	2	5.849470906	5.849470906	141	3.047931581	26.42060316	106	0.713697	2
2.667782045	1.083437605	0.714593345	2	5.853058863	5.853058863	143	3.050890537	26.46516892	108	0.714593	2
2.670064105	1.084047975	0.71664643	3	5.864955054	5.864955054	145	3.054934442	26.50911996	110	0.716646	3
2.671800324	1.087343974	0.718017375	3	5.928119461	5.928119461	147	3.057679377	26.55247301	110	0.718017	3
2.674601049	1.088717307	0.719760683	3	5.953910457	5.953910457	149	3.065695535	26.59524412	111	0.719761	3
2.683651927	1.090243233	0.71985529	2	5.9822253	5.9822253	151	3.074284798	26.63744872	112	0.719855	2
2.685530722	1.091738639	0.720349461	3	6.009626102	6.009626102	153	3.091406324	26.6791016	114	0.720349	3
2.690544274	1.092684713	0.723051789	4	6.026795088	6.026795088	155	3.094384738	26.72021701	116	0.723052	4
2.694910696	1.092837306	0.723701165	4	6.029550857	6.029550857	157	3.095791339	26.76080864	117	0.723701	4
2.695479643	1.093722343	0.726266047	3	6.045471562	6.045471562	159	3.099859486	26.80088967	118	0.726266	3
2.695908342	1.09418012	0.727369421	4	6.053663835	6.053663835	161	3.113633052	26.84047279	119	0.727369	4
2.698424479	1.095950194	0.732208322	3	6.085061866	6.085061866	163	3.117455223	26.87957021	121	0.732208	3
2.711116921	1.099063082	0.733616233	2	6.139276845	6.139276845	165	3.117784948	26.91819371	121	0.733616	2
2.712608986	1.099642933	0.738135642	4	6.149235812	6.149235812	167	3.118546058	26.95635465	124	0.738136	4
2.712852789	1.099642933	0.739698001	3	6.149235812	6.149235812	169	3.138956357	26.99406396	126	0.739698	3
2.721678771	1.100344859	0.741799562	4	6.1612275	6.1612275	171	3.140076664	27.03133222	127	0.7418	4
2.7258382	1.100894192	0.744991529	4	6.170579379	6.170579379	173	3.143156138	27.06816963	128	0.744992	4
2.728367264	1.101229896	0.745293321	3	6.17627509	6.17627509	175	3.146867369	27.10458603	129	0.745293	3
2.728930696	1.101901303	0.747077509	2	6.187625584	6.187625584	177	3.152979098	27.14059093	131	0.747078	2
2.730340199	1.10339671	0.749811644	3	6.212700353	6.212700353	179	3.159273384	27.17619353	133	0.749812	3

2.732329596	1.104037599	0.753202001	3	6.223368726	6.223368726	181	3.165847676	27.21140273	133	0.753202	3
2.740520709	1.104251228	0.7561138	3	6.226915755	6.226915755	183	3.173153529	27.24622712	135	0.756114	3
2.742066154	1.105014191	0.75663652	4	6.239534994	6.239534994	185	3.178288169	27.28067502	136	0.756637	4
2.744417506	1.107669301	0.75669221	2	6.282945176	6.282945176	187	3.179576986	27.31475449	137	0.756692	2
2.749686342	1.108066042	0.757699727	3	6.289363935	6.289363935	189	3.186071744	27.34847333	139	0.7577	3
2.750105976	1.109836116	0.757922663	4	6.317801561	6.317801561	191	3.18653625	27.38183908	141	0.757923	4
2.750112996	1.113589892	0.761252295	2	6.37703695	6.37703695	193	3.191202704	27.41485906	143	0.761252	2
2.751882074	1.114200262	0.76219548	4	6.386532075	6.386532075	195	3.196969478	27.44754037	144	0.762195	4
2.753033269	1.115237892	0.764509542	3	6.402596025	6.402596025	197	3.199502996	27.47988989	145	0.76451	3
2.753111891	1.115298929	0.764872393	4	6.403537352	6.403537352	199	3.202745542	27.51191428	147	0.764872	4
2.755304633	1.117893002	0.76885722	4	6.443243617	6.443243617	201	3.206344985	27.54362001	150	0.768857	4
2.757057345	1.119357891	0.770421535	2	6.465392087	6.465392087	203	3.214865993	27.57501337	152	0.770422	2
2.757480109	1.120090335	0.771549955	2	6.476394699	6.476394699	205	3.216914565	27.60610045	153	0.77155	2
2.759563751	1.120883816	0.776356139	3	6.488256784	6.488256784	207	3.224044995	27.63688716	154	0.776356	3
2.759826365	1.121036409	0.778716337	3	6.490535068	6.490535068	209	3.231259674	27.66737926	155	0.778716	3
2.761104171	1.121066927	0.78216214	3	6.490992089	6.490992089	211	3.231548371	27.69758233	156	0.782162	3
2.761842283	1.121860408	0.786507554	3	6.502785962	6.502785962	213	3.234105622	27.7275018	158	0.786508	3
2.764703092	1.12244026	0.788193845	4	6.511373865	6.511373865	215	3.234530302	27.75714294	158	0.788194	4
2.779800628	1.123783074	0.789295587	3	6.531155375	6.531155375	217	3.239290906	27.78651089	159	0.789296	3
2.785178443	1.125431074	0.795745882	3	6.555227426	6.555227426	219	3.241000824	27.81561064	160	0.795746	3
2.787138816	1.128025147	0.795799636	2	6.592669049	6.592669049	221	3.252934339	27.84444703	161	0.7958	2
2.789880212	1.130314035	0.796690959	2	6.625274434	6.625274434	223	3.253530399	27.8730248	161	0.796691	2
2.790576349	1.131015961	0.802628517	4	6.635192474	6.635192474	225	3.260367511	27.90134855	161	0.802629	4
2.792362968	1.132969146	0.804321398	3	6.662606918	6.662606918	227	3.281959728	27.92942274	164	0.804321	3
2.792528159	1.134342479	0.804737728	4	6.681713128	6.681713128	229	3.285272595	27.95725173	167	0.804738	4
2.793859465	1.134861293	0.805183187	3	6.688895862	6.688895862	231	3.312264339	27.98483978	167	0.805183	3
2.795197639	1.135471664	0.808372908	3	6.697320057	6.697320057	233	3.32253278	28.01219103	167	0.808373	3
2.795688194	1.136722922	0.808834748	2	6.714516328	6.714516328	235	3.323563917	28.03930949	168	0.808835	2
2.800463761	1.137211219	0.813707753	2	6.721194293	6.721194293	237	3.334455229	28.0661991	170	0.813708	2
2.802781049	1.137607959	0.823031295	4	6.726610334	6.726610334	239	3.33961	28.09286369	173	0.823031	4
2.809214268	1.138157292	0.824415423	3	6.734093202	6.734093202	241	3.350570824	28.11930699	175	0.824415	3
2.809491488	1.139469588	0.826766812	3	6.751882918	6.751882918	243	3.356309517	28.14553266	178	0.826767	3
2.812202514	1.140842921	0.830077384	4	6.77038204	6.77038204	245	3.359633452	28.17154423	179	0.830077	4
2.81386486	1.141392254	0.832053021	2	6.777742126	6.777742126	247	3.378214489	28.19734518	180	0.832053	2
2.814474308	1.141422773	0.83266168	4	6.778151399	6.778151399	249	3.393680928	28.22293889	182	0.832662	4
2.826541102	1.142582476	0.833717265	2	6.793635546	6.793635546	251	3.409688453	28.24832867	183	0.833717	2
2.826768728	1.143681143	0.836082768	3	6.808219294	6.808219294	253	3.412079835	28.27351773	183	0.836083	3
2.831571759	1.144444105	0.839071931	3	6.818307864	6.818307864	255	3.415846078	28.29850923	185	0.839072	3
2.833612617	1.144718772	0.843865597	4	6.821929926	6.821929926	257	3.416121204	28.32330625	185	0.843866	4
2.835883118	1.145512253	0.846545571	4	6.832366378	6.832366378	259	3.424062548	28.34791177	186	0.846546	4
2.836190871	1.145756401	0.850959559	3	6.835572347	6.835572347	261	3.425724254	28.37232875	187	0.85096	3
2.837678647	1.145817438	0.852860892	4	6.83637725	6.83637725	263	3.426552646	28.39656005	187	0.852861	4
2.838343763	1.145970031	0.853131046	3	6.838375864	6.838375864	265	3.432440716	28.42060846	188	0.853131	3
2.839241622	1.147648549	0.853882374	2	6.860285592	6.860285592	267	3.433264404	28.44447674	190	0.853882	2
2.839567291	1.150242622	0.856297419	4	6.893818661	6.893818661	269	3.436364193	28.46816755	190	0.856297	4
2.846162913	1.1507004	0.856796219	3	6.899698544	6.899698544	271	3.438680967	28.49168353	191	0.856796	3
2.848600121	1.152806177	0.85844311	2	6.926580934	6.926580934	273	3.442130532	28.51502722	193	0.858443	2
2.849904725	1.154545732	0.859887277	3	6.948606622	6.948606622	275	3.443315728	28.53820114	194	0.859887	3
2.852369246	1.157902768	0.860114677	4	6.990659383	6.990659383	277	3.448248246	28.56120774	196	0.860115	4

2.853621963	1.159489731	0.870103305	2	7.010331754	7.010331754	279	3.449085089	28.58404942	197	0.870103	2
2.853814515	1.159520249	0.871802049	3	7.01070692	7.01070692	281	3.465929969	28.60672851	199	0.871802	3
2.855370472	1.160496841	0.876508005	4	7.022746356	7.022746356	283	3.46708014	28.62924734	202	0.876508	4
2.859636983	1.162205878	0.877613287	2	7.043701114	7.043701114	285	3.47130305	28.65160813	202	0.877613	2
2.861967665	1.163304544	0.879613834	3	7.057097971	7.057097971	287	3.471437848	28.6738131	204	0.879614	3
2.863787459	1.163640248	0.881740311	3	7.061183876	7.061183876	289	3.475401006	28.6958644	205	0.88174	3
2.871356843	1.167638173	0.883692385	2	7.109375727	7.109375727	291	3.475726376	28.71776414	205	0.883692	2
2.874452604	1.167882321	0.889553745	3	7.112295205	7.112295205	293	3.484352415	28.73951439	206	0.889554	3
2.877035813	1.172093875	0.890214338	3	7.162233285	7.162233285	295	3.486021538	28.76111719	206	0.890214	3
2.877576647	1.173253578	0.891128884	2	7.1758416	7.1758416	297	3.497997594	28.78257451	208	0.891129	2
2.877657595	1.173345134	0.892357486	4	7.17691253	7.17691253	299	3.506242925	28.8038883	210	0.892357	4
2.880491343	1.174260689	0.892696978	4	7.187615008	7.187615008	301	3.519369642	28.82506047	212	0.892697	4
2.881659067	1.17731254	0.892986599	4	7.223030732	7.223030732	303	3.533775398	28.84609289	214	0.892987	4
2.88563036	1.178838466	0.896349969	4	7.240595349	7.240595349	305	3.536216821	28.86698739	216	0.89635	4
2.88843262	1.179235206	0.898908422	2	7.245151917	7.245151917	307	3.539315445	28.88774577	217	0.898908	2
2.889804317	1.179479354	0.899068992	3	7.247948613	7.247948613	309	3.548588125	28.90836979	217	0.899069	3
2.897709111	1.180303354	0.901702585	3	7.257368705	7.257368705	311	3.558036996	28.92886118	219	0.901703	3
2.907439446	1.181035798	0.901801668	3	7.265724687	7.265724687	313	3.559482043	28.94922163	220	0.901802	3
2.919375856	1.181890316	0.903783749	3	7.275444912	7.275444912	315	3.563713674	28.96945281	222	0.903784	3
2.919528417	1.182256539	0.908102653	3	7.27960585	7.27960585	317	3.569088271	28.98955635	224	0.908103	3
2.91955897	1.182378613	0.908573236	3	7.280990556	7.280990556	319	3.569354132	29.00953384	226	0.908573	3
2.91989817	1.188085574	0.916151951	3	7.345082647	7.345082647	321	3.570949642	29.02938687	226	0.916152	3
2.919900081	1.188970611	0.916713069	4	7.354912011	7.354912011	323	3.572066112	29.04911696	228	0.916713	4
2.920519122	1.18939787	0.91677534	3	7.359645931	7.359645931	325	3.574244493	29.06872564	231	0.916775	3
2.923283694	1.189550462	0.91820346	3	7.361337591	7.361337591	327	3.578772167	29.08821439	233	0.918203	3
2.926122677	1.18979461	0.928583527	3	7.364038791	7.364038791	329	3.582293899	29.10758466	234	0.928584	3
2.926427761	1.190527055	0.931434348	3	7.372135567	7.372135567	331	3.588440371	29.12683789	235	0.931434	3
2.927035318	1.19061861	0.932455229	2	7.373145106	7.373145106	333	3.592949259	29.14597548	237	0.932455	2
2.933763692	1.191320536	0.933982839	3	7.380880359	7.380880359	335	3.601543158	29.16499882	240	0.933983	3
2.935526184	1.191351054	0.93491858	4	7.381214598	7.381214598	337	3.606180379	29.18390927	241	0.934919	4
2.943194235	1.191625721	0.935265077	3	7.384236394	7.384236394	339	3.614350507	29.20270814	243	0.935265	3
2.9463639	1.192999054	0.935753425	3	7.399304448	7.399304448	341	3.618764782	29.22139676	246	0.935753	3
2.946451088	1.193121128	0.938493991	3	7.400641405	7.400641405	343	3.624876049	29.2399764	249	0.938494	3
2.951166839	1.193884091	0.94037541	3	7.408983745	7.408983745	345	3.633304331	29.25844834	250	0.940375	3
2.964339319	1.193945128	0.943143692	2	7.409652224	7.409652224	347	3.647807305	29.27681381	250	0.943144	2
2.971799931	1.194250313	0.945458899	3	7.412980974	7.412980974	349	3.649987846	29.29507403	251	0.945459	3
2.973648352	1.195318461	0.950816768	3	7.424611138	7.424611138	351	3.655163099	29.3132302	252	0.950817	3
2.975982262	1.196295053	0.951477381	2	7.435211299	7.435211299	353	3.664112497	29.33128351	255	0.951477	2
2.978526306	1.196386608	0.958564285	2	7.436203785	7.436203785	355	3.668458268	29.3492351	257	0.958564	2
2.992008886	1.196905423	0.962008646	3	7.441821051	7.441821051	357	3.67803572	29.36708613	259	0.962009	3
2.992265436	1.19696646	0.962463554	4	7.442482709	7.442482709	359	3.687673423	29.38483771	261	0.962464	4
2.993019903	1.199194311	0.964941927	2	7.466493369	7.466493369	361	3.691114312	29.40249094	263	0.964942	2
2.993919498	1.199530015	0.968407771	3	7.470094968	7.470094968	363	3.692184071	29.42004691	264	0.968408	3
2.99412933	1.200476089	0.970321209	3	7.480234697	7.480234697	365	3.712252172	29.43750668	264	0.970321	3
2.994603982	1.201391644	0.97046129	2	7.490019723	7.490019723	367	3.713363494	29.4548713	267	0.970461	2
2.996080436	1.20270394	0.976676771	4	7.503996383	7.503996383	369	3.722620183	29.4721418	267	0.976677	4
3.666916748	1.203497421	0.979567032	3	7.512420578	7.512420578	371	3.732599061	29.4893192	269	0.979567	3
3.67013845	1.203711051	0.980661962	3	7.514685219	7.514685219	373	3.737870237	29.5064045	272	0.980662	3
3.67471677	1.203955199	0.980835768	5	7.517270458	7.517270458	375	3.738152163	29.52339867	274	0.980836	5

3.675966909	1.203955199	0.982622815	5	7.517270458	7.517270458	377	3.738551863	29.54030269	275	0.982623	5
3.67618526	1.204718162	0.986584654	3	7.52533995	7.52533995	379	3.761049782	29.5571175	276	0.986585	3
3.677604396	1.20596942	0.987799815	4	7.538538992	7.538538992	381	3.767871105	29.57384405	277	0.9878	4
3.677949714	1.210211493	0.989100872	4	7.582938249	7.582938249	383	3.798408544	29.59048325	278	0.989101	4
3.680673595	1.210516678	0.989745313	3	7.586110112	7.586110112	385	3.799388208	29.60703602	279	0.989745	3
3.68232637	1.210547197	0.993564393	4	7.586430709	7.586430709	387	3.815980363	29.62350324	282	0.993564	4
3.683094016	1.210547197	0.995100356	3	7.586430709	7.586430709	389	3.81866966	29.63988579	284	0.9951	3
3.685300503	1.210943937	0.995996826	5	7.59055072	7.59055072	391	3.839320039	29.65618455	286	0.995997	5
3.690284227	1.211218604	0.997400048	4	7.593401986	7.593401986	393	3.86299236	29.67240036	286	0.9974	4
3.691335619	1.212012085	1.668614068	4	7.601621544	7.601621544	395	3.868068491	29.68853407	289	0.998	4
3.692113451	1.213202307	1.669899347	3	7.613920186	7.613920186	397	3.886722304	29.70458649	290	0.999	3
3.694789712	1.214850307	1.670880834	5	7.630891357	7.630891357	399	3.897207683	29.72055846	291	0.9995	5

ATTACHMENT # 4a, for ZTC Protocol Report #9, for RP v.3.xx

RESULTS SUMMARY

1. TRANSFORMATIONS	SOURCE (see Protocol)	RPv3 FORMULA MATCHES SOURCE ?
F (untransformed, "exact")	Tobias, pg. 147	YES
F (untransformed, "interval")	Tobias, pg. 149	YES
Z (F) (Normal distribution)	D'Agostino p. 465	YES (Excel function "NORMSINV" is used)
T (F) (Student's distribution)	Based on standard statistical theory.	YES (Excel function "TINV" is used)
LN (F)	Meeker, pg. 157	YES
THREE PARAMETER	Meeker, pg. 142	YES
WEIBULL (standardized)	D'Agostino, pg. 465	YES
EXPONENTIAL	D'Agostino, pg. 465	YES
CUMULATIVE HAZARD	Tobias, pp. 143ff + 163ff	YES
LOGISTIC	D'Agostino, pg. 465	YES
CHI-SQUARE	Hawkins, p. 296	YES (Excel function "CHIINV" is used)
LARGEST EXTREME VALUE	Meeker, pg. 87	YES
LAPLACE	D'Agostino, pg. 465	YES
CAUCHY	D'Agostino, pg. 465	YES
1 / X	Alder, pg. 347	YES
SQRT (X)	Juran, pg. 23.93	YES
SQRT (X + 0.5)	Steel, pg. 157	YES
SQRT (X) + SQRT (X + 1)	Dixon, pg. 354	YES
CUBE ROOT (X)	Juran, pg. 23.92	YES
QUATERNARY ROOT (X)	Hawkins, pg. 296	YES
(X + 1) (X + 1)	see Transformation discussion in RP3	YES
(X + 1) (X + 1) (X + 1)	see Transformation discussion in RP3	YES
LN (X)	Juran, pg. 23.93	YES
LN (X / (1 – X))	Juran, pg. 23.93	YES
LN (X + SQRT (1 + X^2))	Gross, pg. 148	YES
LN ((1 + X) / (1 – X)) (0.5)	Juran, pg. 23.93	YES
ARCSIN (SQRT (X))	Juran, pg. 23.92	YES
ARCSINH (SQRT (X))	Juran, pg. 23.92	YES
ARCSIN (SQRT (X / (N + 1))) + ARCSIN (SQRT ((X + 1) / (N + 1)))	Dixon, pg. 324	YES
SQRT (X + A)	Hald, pg. 175	YES

1. (continued from previous page)

((X ^ B) – 1) / B	NIST (section 1.3.3.5)	YES
X ^ C	This is an extrapolation from other transformations (for example, SQRT is C = 0.5, 1 / X is C = −1, and QUATERNARY ROOT is C = 0.25	(not applicable, because there are no formal references; however, YES, the formula on the hidden RPv3 worksheet matches X^C)
LN (X + D)	Hald, pg. 175	YES
1 / (X + E)	Hald, pg. 175	YES

2.

USER CHOICE	USED BY HIDDEN CALCULATIONS	"USED" MATCHES "CHOICE"?
F (untransformed, "exact")	F (untransformed, "exact")	YES
F (untransformed, "interval")	F (untransformed, "interval")	YES
Z (F) (Normal distribution)	Z (F) (Normal distribution)	YES
T (F) (Student's distribution)	T (F) (Student's distribution)	YES
LN (F)	LN (F)	YES
THREE PARAMETER	THREE PARAMETER	YES
WEIBULL (standardized)	WEIBULL (standardized)	YES
EXPONENTIAL	EXPONENTIAL	YES
CUMULATIVE HAZARD	CUMULATIVE HAZARD	YES
LOGISTIC	LOGISTIC	YES
CHI-SQUARE	CHI-SQUARE	YES
LARGEST EXTREME VALUE	LARGEST EXTREME VALUE	YES
LAPLACE	LAPLACE	YES
CAUCHY	CAUCHY	YES
X (untransformed)	X (untransformed)	YES
1 / X	1 / X	YES
SQRT (X)	SQRT (X)	YES
SQRT (X + 0.5)	SQRT (X + 0.5)	YES
SQRT (X) + SQRT (X + 1)	SQRT (X) + SQRT (X + 1)	YES
CUBE ROOT (X)	CUBE ROOT (X)	YES
QUATERNARY ROOT (X)	QUATERNARY ROOT (X)	YES
(X + 1) (X + 1)	(X + 1) (X + 1)	YES
(X + 1) (X + 1) (X + 1)	(X + 1) (X + 1) (X + 1)	YES
LN (X)	LN (X)	YES
LN (X / (1 – X))	LN (X / (1 – X))	YES

2. (continued from previous page)

LN (X + SQRT (1 + X^2))	LN (X + SQRT (1 + X^2))	YES
LN ((1 + X) / (1 – X)) (0.5)	LN ((1 + X) / (1 – X)) (0.5)	YES
ARCSIN (SQRT (X))	ARCSIN (SQRT (X))	YES
ARCSINH (SQRT (X))	ARCSINH (SQRT (X))	YES
ARCSIN (SQRT (X / (N + 1))) + ARCSIN (SQRT ((X + 1) / (N + 1)))	ARCSIN (SQRT (X / (N + 1))) + ARCSIN (SQRT ((X + 1) / (N + 1)))	YES
SQRT (X + A)	SQRT (X + A)	YES
((X ^ B) – 1) / B	((X ^ B) – 1) / B	YES
X ^ C	X ^ C	YES
LN (X + D)	LN (X + D)	YES
1 / (X + E)	1 / (X + E)	YES

3.

Y_TRANSFORMATIONS	**REVERSED VALUES = INPUTTED ONES?**
F (untransformed, "exact")	N/A, because no transformation performed.
F (untransformed, "interval")	N/A, because no transformation performed.
Z (F) (Normal distribution)	YES
T (F) (Student's distribution)	YES
LN (F)	YES
THREE PARAMETER	YES
WEIBULL (standardized)	YES
EXPONENTIAL	YES
CUMULATIVE HAZARD	N/A, because no transformation performed or needed; see Appendix 4b
LOGISTIC	YES
CHI-SQUARE	YES
LARGEST EXTREME VALUE	YES
LAPLACE	YES
CAUCHY	YES

4.

Y_TRANSFORMATIONS	X_TRANSFORMATIONS	RPv3 CC & Reliability "Same" as RPv1 ?	RPv3 CC & Reliability "Same" as RPv2 ?
F (untransformed, "exact")	1 / X	YES	YES
F (untransformed, "interval")	SQRT (X)	YES	YES
Z (F) (Normal distribution)	SQRT (X + 0.5)	YES	YES
LN (F)	SQRT (X) + SQRT (X + 1)	YES	YES
THREE PARAMETER	CUBE ROOT (X)	YES	YES
WEIBULL (standardized)	LN (X)	YES	YES
LN (F)	LN (X / (1 – X))	YES	YES
LOGISTIC	LN ((1 + X) / (1 – X)) (0.5)	YES	YES
WEIBULL (standardized)	ARCSIN (SQRT (X))	YES	YES
EXPONENTIAL (aka, CumHaz#1)	ARCSINH (SQRT (X))	YES	YES
CUMULATIVE HAZARD (aka, CumHaz#2)	((X ^ B) – 1) / B	n/a	YES
LOGISTIC	X ^ C	n/a	YES
LARGEST EXTREME VALUE	1 / X	YES	YES

ATTACHMENT # 4b, for ZTC Protocol Report #9, for RP v.3.xx

DETAILED RESULTS (these values are inputted and outputted on hidden worksheets within RPv3)

3. Y_TRANSFORMATIONS	MANUALLY INPUTTED F VALUES	TRANSFORMED F VALUES	REVERSE TRANSFORMED F VALUES	Ratio of Reversed to Input	"Same" ?
Z (F) (Normal distribution)	0.000001	-4.7534243	0.000001	100%	**Yes**
	0.00001	-4.2648908	0.000010	100%	**Yes**
	0.0001	-3.7190165	0.000100	100%	**Yes**
	0.001	-3.0902323	0.001000	100%	**Yes**
	0.01	-2.3263479	0.010000	100%	**Yes**
	0.1	-1.2815516	0.100000	100%	**Yes**
	0.5	0.0000000	0.500000	100%	**Yes**
	0.9	1.2815516	0.900000	100%	**Yes**
	0.99	2.3263479	0.990000	100%	**Yes**
	0.999	3.0902323	0.999000	100%	**Yes**
	0.9999	3.7190165	0.999900	100%	**Yes**
	0.99999	4.2648908	0.999990	100%	**Yes**
	0.999999	4.7534243	0.999999	100%	**Yes**
T (F) (Student's distribution)	0.000001	See "note" below.	See "note" below.	See "note" below.	**N / A**
	0.00001	-10.1026843	#N/A	#N/A	**Yes**
(using DF = 7)	0.0001	-7.0634328	0.000100	100%	**Yes**
	0.001	-4.7852896	0.001000	100%	**Yes**
	0.01	-2.9979516	0.010000	100%	**Yes**
	0.1	-1.4149239	0.100000	100%	**Yes**
	0.5	0.0000000	0.500000	100%	**Yes**
	0.9	1.4149239	0.900000	100%	**Yes**
	0.99	2.9979516	0.990000	100%	**Yes**
	0.999	4.7852896	0.999000	100%	**Yes**
	0.9999	7.0634328	0.999900	100%	**Yes**
	0.99999	10.1026843	#N/A	#N/A	**Yes**
	0.999999	See "note" below.	See "note" below.	See "note" below.	**N / A**
LN (F)	0.000001	-13.815511	0.000001	100%	**Yes**
	0.00001	-11.512925	0.000010	100%	**Yes**
	0.0001	-9.210340	0.000100	100%	**Yes**
	0.001	-6.907755	0.001000	100%	**Yes**
	0.01	-4.605170	0.010000	100%	**Yes**
	0.1	-2.302585	0.100000	100%	**Yes**
	0.5	-0.693147	0.500000	100%	**Yes**
	0.9	-0.105361	0.900000	100%	**Yes**
	0.99	-0.010050	0.990000	100%	**Yes**
	0.999	-0.001001	0.999000	100%	**Yes**
	0.9999	-0.000100	0.999900	100%	**Yes**
	0.99999	-0.000010	0.999990	100%	**Yes**
	0.999999	-0.000001	0.999999	100%	**Yes**

NOTE: With very high & very low F-values, Excel's accuracy with conversion from TINV to TDIST (the Excel functions used for this transformation and reverse transformation) is less than allowed by the RPv3 Protocol; therefore RPv3 has been designed to not allow use of this transformation if the resulting reliability is less than 0.001% or greater than 99.999% --- an error message appears instead of results that are outside that range.

THREE PARAMETER	0.000001	0.008622	0.000001	100%	**Yes**
	0.00001	0.014053	0.000010	100%	**Yes**
	0.0001	0.024258	0.000100	100%	**Yes**
	0.001	0.045491	0.001000	100%	**Yes**
	0.01	0.097652	0.010000	100%	**Yes**
	0.1	0.277606	0.100000	100%	**Yes**
	0.5	1.000000	0.500000	100%	**Yes**
	0.9	3.602224	0.900000	100%	**Yes**
	0.99	10.240474	0.990000	100%	**Yes**
	0.999	21.982184	0.999000	100%	**Yes**
	0.9999	41.223830	0.999900	100%	**Yes**
	0.99999	71.157149	0.999990	100%	**Yes**
	0.999999	115.980763	0.999999	100%	**Yes**

WEIBULL (standardized)	0.000001	-13.815510	0.000001	100%	**Yes**
	0.00001	-11.512920	0.000010	100%	**Yes**
	0.0001	-9.210290	0.000100	100%	**Yes**
	0.001	-6.907255	0.001000	100%	**Yes**
	0.01	-4.600149	0.010000	100%	**Yes**
	0.1	-2.250367	0.100000	100%	**Yes**
	0.5	-0.366513	0.500000	100%	**Yes**
	0.9	0.834032	0.900000	100%	**Yes**
	0.99	1.527180	0.990000	100%	**Yes**
	0.999	1.932645	0.999000	100%	**Yes**
	0.9999	2.220327	0.999900	100%	**Yes**
	0.99999	2.443470	0.999990	100%	**Yes**
	0.999999	2.625792	0.999999	100%	**Yes**

EXPONENTIAL	0.000001	0.000001	0.000001	100%	**Yes**
	0.00001	0.000010	0.000010	100%	**Yes**
	0.0001	0.000100	0.000100	100%	**Yes**
	0.001	0.001001	0.001000	100%	**Yes**
	0.01	0.010050	0.010000	100%	**Yes**
	0.1	0.105361	0.100000	100%	**Yes**
	0.5	0.693147	0.500000	100%	**Yes**
	0.9	2.302585	0.900000	100%	**Yes**
	0.99	4.605170	0.990000	100%	**Yes**
	0.999	6.907755	0.999000	100%	**Yes**
	0.9999	9.210340	0.999900	100%	**Yes**
	0.99999	11.512925	0.999990	100%	**Yes**
	0.999999	13.815511	0.999999	100%	**Yes**

CUMULATIVE HAZARD	When using this transformation, reliability can be calculated for a "Specification Limit" only if that limit is less than any inputted stress value. In this transformation, the lowest F value is not transformed at all (that is, it always equals F_(untransformed)). Since the inputted specification limit must be the lowest X value, its corresponding Y-value therefore transforms to the lowest F value, and therefore equals the extrapolated F_(untransformed) result. Therefore, this transformation does not have an associated "reverse transformation".	n/a

LOGISTIC	0.000001	-13.815510	0.000001	100%	**Yes**
	0.00001	-11.512915	0.000010	100%	**Yes**
	0.0001	-9.210240	0.000100	100%	**Yes**
	0.001	-6.906755	0.001000	100%	**Yes**
	0.01	-4.595120	0.010000	100%	**Yes**
	0.1	-2.197225	0.100000	100%	**Yes**
	0.5	0.000000	0.500000	100%	**Yes**
	0.9	2.197225	0.900000	100%	**Yes**
	0.99	4.595120	0.990000	100%	**Yes**
	0.999	6.906755	0.999000	100%	**Yes**
	0.9999	9.210240	0.999900	100%	**Yes**
	0.99999	11.512915	0.999990	100%	**Yes**
	0.999999	13.815510	0.999999	100%	**Yes**

CHI-SQUARE	0.000001	See "note" below.	See "note" below.	See "note" below.	**N / A**
	0.00001	-73.474891	0.000010	100%	**Yes**
(using DF = 29)	0.0001	-66.151685	0.000100	100%	**Yes**
	0.001	-58.301173	0.001000	100%	**Yes**
	0.01	-49.587885	0.010000	100%	**Yes**
	0.1	-39.087470	0.100000	100%	**Yes**
	0.5	-28.336128	0.500000	100%	**Yes**
	0.9	-19.767744	0.900000	100%	**Yes**
	0.99	-14.256455	0.990000	100%	**Yes**
	0.999	-10.986054	0.999000	100%	**Yes**
	0.9999	-8.731491	0.999900	100%	**Yes**
	0.99999	-7.067302	0.999990	100%	**Yes**
	0.999999	-5.789704	0.999999	100%	**Yes**

NOTE: With very low F-values, Excel's accuracy with conversion from CHIINV to CHIDIST (the Excel functions used for this transformation & reverse transformation) is less than allowed by the RPv3 Protocol; therefore RPv3 has been designed to not allow use of this transformation if the resulting reliability is less than 0.001% or greater than 99.999% --- an error message appears instead of results that are outside that range.

LARGEST EXTREME VALUE	0.000001	-2.6257919	0.000001	100%	**Yes**
	0.00001	-2.4434704	0.000010	100%	**Yes**
	0.0001	-2.2203268	0.000100	100%	**Yes**
	0.001	-1.9326447	0.001000	100%	**Yes**
	0.01	-1.5271796	0.010000	100%	**Yes**
	0.1	-0.8340324	0.100000	100%	**Yes**
	0.5	0.3665129	0.500000	100%	**Yes**
	0.9	2.2503673	0.900000	100%	**Yes**
	0.99	4.6001492	0.990000	100%	**Yes**
	0.999	6.9072551	0.999000	100%	**Yes**
	0.9999	9.2102904	0.999900	100%	**Yes**
	0.99999	11.5129205	0.999990	100%	**Yes**
	0.999999	13.8155101	0.999999	100%	**Yes**

LAPLACE	0.000001	-13.1223634	0.000001	100%	**Yes**
	0.00001	-10.8197783	0.000010	100%	**Yes**
	0.0001	-8.5171932	0.000100	100%	**Yes**
	0.001	-6.2146081	0.001000	100%	**Yes**
	0.01	-3.9120230	0.010000	100%	**Yes**
	0.1	-1.6094379	0.100000	100%	**Yes**
	0.5	0.0000000	0.500000	100%	**Yes**
	0.9	1.6094379	0.900000	100%	**Yes**
	0.99	3.9120230	0.990000	100%	**Yes**
	0.999	6.2146081	0.999000	100%	**Yes**
	0.9999	8.5171932	0.999900	100%	**Yes**
	0.99999	10.8197783	0.999990	100%	**Yes**
	0.999999	13.1223634	0.999999	100%	**Yes**

CAUCHY	0.000001	-318309.8862	0.000001	100%	**Yes**
	0.00001	-31830.9886	0.000010	100%	**Yes**
	0.0001	-3183.0988	0.000100	100%	**Yes**
	0.001	-318.3088	0.001000	100%	**Yes**
	0.01	-31.820516	0.010000	100%	**Yes**
	0.1	-3.077684	0.100000	100%	**Yes**
	0.5	0.000000	0.500000	100%	**Yes**
	0.9	3.077684	0.900000	100%	**Yes**
	0.99	31.820516	0.990000	100%	**Yes**
	0.999	318.3088	0.999000	100%	**Yes**
	0.9999	3183.0988	0.999900	100%	**Yes**
	0.99999	31830.9886	0.999990	100%	**Yes**
	0.999999	318309.8862	0.999999	100%	**Yes**

ATTACHMENT # 4b, for ZTC Protocol Report #9, for RP v.3.xx

DETAILED RESULTS (some of these values are inputted and outputted on hidden worksheets within RPv3)

4.	Y_TRANSFORMATIONS	X_TRANSFORMATIONS	Other Data & Condition as were used in Test #...	Correlation Coefficients					Reliability Results				
				v1	v2	v3	v3 / v1	v3 / v2	v1	v2	v3	v3 / v1	v3 / v2
	F (untransformed, "exact")	1 / X	A	0.543000	0.543000	0.543000	100.0000%	100.0000%	122.1196%	122.1196%	122.1196%	100.0000%	100.0000%
	F (untransformed, "interval")	SQRT (X)	B	0.964492	0.964492	0.964492	100.0000%	100.0000%	17.1626%	17.1626%	17.1626%	100.0000%	100.0000%
	Z (F) (Normal distribution)	SQRT (X + 0.5)	C	0.926240	0.926240	0.926240	100.0000%	100.0000%	99.9608%	99.9608%	99.9608%	100.0000%	100.0000%
	LN (F)	SQRT (X) + SQRT (X + 1)	D	0.907862	0.907862	0.907862	100.0000%	100.0000%	72.8022%	72.8022%	72.8022%	100.0000%	100.0000%
	THREE PARAMETER	CUBE ROOT (X)	E	0.992286	0.992286	0.992286	100.0000%	100.0000%	99.5412%	99.5412%	99.5412%	100.0000%	100.0000%
	WEIBULL (standardized)	LN (X)	F	0.981458	0.981458	0.981458	100.0000%	100.0000%	99.9981%	99.9981%	99.9981%	100.0000%	100.0000%
	LN (F)	LN (X / (1 – X))	H, with Spec Limit = 1.000	0.909677	0.909677	0.909677	100.0000%	100.0000%	93.8947%	93.8947%	93.8947%	100.0000%	100.0000%
	LOGISTIC	LN ((1 + X) / (1 – X)) (0.5)	K	0.974401	0.974401	0.974401	100.0000%	100.0000%	98.9120%	98.9120%	98.9120%	100.0000%	100.0000%
	WEIBULL (standardized)	ARCSIN (SQRT (X))	T	0.929994	0.929994	0.929994	100.0000%	100.0000%	99.8500%	99.8500%	99.8500%	100.0000%	100.0000%
	EXPONENTIAL (aka, CumHaz#1)	ARCSINH (SQRT (X))	G	0.798104	0.798104	0.798104	100.0000%	100.0000%	878.9954%	878.9954%	878.9954%	100.0000%	100.0000%
	CUMULATIVE HAZARD (aka, CumHaz#2)	((X ^ B) – 1) / B	V, with B = 5	n/a	0.918573	0.918573	n/a	100.0000%	n/a	87.3014%	87.3014%	n/a	100.0000%
	LOGISTIC	X ^ C	I, with C = 6	n/a	0.845781	0.845781	n/a	100.0000%	n/a	56.1736%	56.1736%	n/a	100.0000%
	LARGEST EXTREME VALUE	1 / X	J	0.955822	0.955822	0.955822	100.0000%	100.0000%	89.4608%	89.4608%	89.4608%	100.0000%	100.0000%

ATTACHMENT # 4c, for ZTC Protocol Report #9, for RP v.4.xx

DETAILED RESULTS (the "Hidden Calculation Worksheet" values come from a hidden worksheet within RPv4)

	Results: % "below spec limit", as shown on ...				Ratio of Hidden Calc Worksheet Result to...		
	Preliminary Analysis Output table	Final Report	Full Report	Hidden Calculation Worksheet	Preliminary Analysis Output table	Final Report	Full Report
Exact or Interval	Exact						
Stress Values	10, 11, 12, 13						
Stress Value Quantities	n/a						
Specification Limit	9.9999						
Failures = Above or Below Spec Limit?	below						
Confidence Level	0.95						
Total Number of Devices Put On-test	5						
X-axis Transformation	Ln (X)						
F (untransformed)	15.010707%	15.010707%	15.010707%	15.010707%	100.0000%	100.0000%	100.0000%
Z (F) (Normal distribution)	15.460556%	15.460556%	15.460556%	15.460556%	100.0000%	100.0000%	100.0000%
T (F) (Student's distribution)	16.315546%	16.315546%	16.315546%	16.315546%	100.0000%	100.0000%	100.0000%
LN (F)	22.653376%	22.653376%	22.653376%	22.653376%	100.0000%	100.0000%	100.0000%
THREE PARAMETER	30.029429%	30.029429%	30.029429%	30.029429%	100.0000%	100.0000%	100.0000%
WEIBULL (standardized)	19.477145%	19.477145%	19.477145%	19.477145%	100.0000%	100.0000%	100.0000%
EXPONENTIAL	27.732660%	27.732660%	27.732660%	27.732660%	100.0000%	100.0000%	100.0000%
CUMULATIVE HAZARD	40.643239%	40.643239%	40.643239%	40.643239%	100.0000%	100.0000%	100.0000%
LOGISTIC	16.435006%	16.435006%	16.435006%	16.435006%	100.0000%	100.0000%	100.0000%
CHI-SQUARE	17.422184%	17.422184%	17.422184%	17.422184%	100.0000%	100.0000%	100.0000%
LARGEST EXTREME VALUE	15.908051%	15.908051%	15.908051%	15.908051%	100.0000%	100.0000%	100.0000%
LAPLACE	19.786330%	19.786330%	19.786330%	19.786330%	100.0000%	100.0000%	100.0000%
CAUCHY	21.591712%	21.591712%	21.591712%	21.591712%	100.0000%	100.0000%	100.0000%

	Results: % "below spec limit", as shown on …				Ratio of Hidden Calc Worksheet Result to...		
	Preliminary Analysis Output table	Final Report	Full Report	Hidden Calculation Worksheet	Preliminary Analysis Output table	Final Report	Full Report
Exact or Interval	Exact						
Stress Values	10, 11, 12, 13						
Stress Value Quantities	n/a						
Specification Limit	13.0001						
Failures = Above or Below Spec Limit?	above						
Confidence Level	0.95						
Total Number of Devices Put On-test	5						
X-axis Transformation	Ln (X)						
F (untransformed)	64.950248%	64.950248%	64.950248%	64.950248%	100.0000%	100.0000%	100.0000%
Z (F) (Normal distribution)	65.876375%	65.876375%	65.876375%	65.876375%	100.0000%	100.0000%	100.0000%
T (F) (Student's distribution)	64.807247%	64.807247%	64.807247%	64.807247%	100.0000%	100.0000%	100.0000%
LN (F)	50.503906%	50.503906%	50.503906%	50.503906%	100.0000%	100.0000%	100.0000%
THREE PARAMETER	56.036087%	56.036087%	56.036087%	56.036087%	100.0000%	100.0000%	100.0000%
WEIBULL (standardized)	59.385848%	59.385848%	59.385848%	59.385848%	100.0000%	100.0000%	100.0000%
EXPONENTIAL	56.744721%	56.744721%	56.744721%	56.744721%	100.0000%	100.0000%	100.0000%
CUMULATIVE HAZARD	error message	error message	error message	error message	CumHaz is unable to calculate reliability "above" spec		
LOGISTIC	64.656240%	64.656240%	64.656240%	64.656240%	100.0000%	100.0000%	100.0000%
CHI-SQUARE	63.365638%	63.365638%	63.365638%	63.365638%	100.0000%	100.0000%	100.0000%
LARGEST EXTREME VALUE	63.941718%	63.941718%	63.941718%	63.941718%	100.0000%	100.0000%	100.0000%
LAPLACE	59.533657%	59.533657%	59.533657%	59.533657%	100.0000%	100.0000%	100.0000%
CAUCHY	50.828465%	50.828465%	50.828465%	50.828465%	100.0000%	100.0000%	100.0000%

	Results: % "below spec limit", as shown on …				Ratio of Hidden Calc Worksheet Result to...		
	Preliminary Analysis Output table	Final Report	Full Report	Hidden Calculation Worksheet	Preliminary Analysis Output table	Final Report	Full Report
Exact or Interval	Interval						
Stress Values	10, 11, 12, 13						
Stress Value Quantities	10 at each stress level						
Specification Limit	9.9999						
Failures = Above or Below Spec Limit?	below						
Confidence Level	0.95						
Total Number of Devices Put On-test	50						
X-axis Transformation	Ln (X)						
F (untransformed)	22.229940%	22.229940%	22.229940%	22.229940%	100.0000%	100.0000%	100.0000%
Z (F) (Normal distribution)	22.598886%	22.598886%	22.598886%	22.598886%	100.0000%	100.0000%	100.0000%
T (F) (Student's distribution)	22.793771%	22.793771%	22.793771%	22.793771%	100.0000%	100.0000%	100.0000%
LN (F)	29.204396%	29.204396%	29.204396%	29.204396%	100.0000%	100.0000%	100.0000%
THREE PARAMETER	48.851060%	48.851060%	48.851060%	48.851060%	100.0000%	100.0000%	100.0000%
WEIBULL (standardized)	23.927104%	23.927104%	23.927104%	23.927104%	100.0000%	100.0000%	100.0000%
EXPONENTIAL	42.178814%	42.178814%	42.178814%	42.178814%	100.0000%	100.0000%	100.0000%
CUMULATIVE HAZARD	40.643239%	40.643239%	40.643239%	40.643239%	100.0000%	100.0000%	100.0000%
LOGISTIC	22.830737%	22.830737%	22.830737%	22.830737%	100.0000%	100.0000%	100.0000%
CHI-SQUARE	21.885792%	21.885792%	21.885792%	21.885792%	100.0000%	100.0000%	100.0000%
LARGEST EXTREME VALUE	29.063718%	29.063718%	29.063718%	29.063718%	100.0000%	100.0000%	100.0000%
LAPLACE	24.696635%	24.696635%	24.696635%	24.696635%	100.0000%	100.0000%	100.0000%
CAUCHY	24.460840%	24.460840%	24.460840%	24.460840%	100.0000%	100.0000%	100.0000%

	Results: % "below spec limit", as shown on …				Ratio of Hidden Calc Worksheet Result to...		
	Preliminary Analysis Output table	Final Report	Full Report	Hidden Calculation Worksheet	Preliminary Analysis Output table	Final Report	Full Report
Exact or Interval	Interval						
Stress Values	10, 11, 12, 13						
Stress Value Quantities	10 at each stress level						
Specification Limit	13.001						
Failures = Above or Below Spec Limit?	above						
Confidence Level	0.95						
Total Number of Devices Put On-test	50						
X-axis Transformation	Ln (X)						
F (untransformed)	76.138416%	76.138416%	76.138416%	76.138416%	100.0000%	100.0000%	100.0000%
Z (F) (Normal distribution)	76.037290%	76.037290%	76.037290%	76.037290%	100.0000%	100.0000%	100.0000%
T (F) (Student's distribution)	75.893459%	75.893459%	75.893459%	75.893459%	100.0000%	100.0000%	100.0000%
LN (F)	65.158628%	65.158628%	65.158628%	65.158628%	100.0000%	100.0000%	100.0000%
THREE PARAMETER	63.414736%	63.414736%	63.414736%	63.414736%	100.0000%	100.0000%	100.0000%
WEIBULL (standardized)	75.932889%	75.932889%	75.932889%	75.932889%	100.0000%	100.0000%	100.0000%
EXPONENTIAL	65.297816%	65.297816%	65.297816%	65.297816%	100.0000%	100.0000%	100.0000%
CUMULATIVE HAZARD	error message	error message	error message	error message	CumHaz is unable to calculate reliability "above" spec		
LOGISTIC	75.864046%	75.864046%	75.864046%	75.864046%	100.0000%	100.0000%	100.0000%
CHI-SQUARE	77.839475%	77.839475%	77.839475%	77.839475%	100.0000%	100.0000%	100.0000%
LARGEST EXTREME VALUE	70.700090%	70.700090%	70.700090%	70.700090%	100.0000%	100.0000%	100.0000%
LAPLACE	74.190137%	74.190137%	74.190137%	74.190137%	100.0000%	100.0000%	100.0000%
CAUCHY	74.502477%	74.502477%	74.502477%	74.502477%	100.0000%	100.0000%	100.0000%

ATTACHMENT # 5a, for ZTC Protocol Report #9, for RP v.5.xx

DETAILED RESULTS

PART (1a) PER THE PROTOCOL (all data having been sorted and arranged, top to bottom, from lowest to highest numerical value, before being pasted into the data entry table)

		Comparison of **Correlation Coefficient** outputted by both versions								
		Data Set A (n=10)		Data Set D (n=30)		Data Set C (n=200)		Data Set H (n=600)		v5.01 = v4.06 in all cases?
Y-AXIS TRANSFORMATION	X-AXIS TRANSFORMATION	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	
F (untransformed)	SQRT (X + A)	0.93639	0.93639	0.82517	0.82517	0.90557	0.90557	0.88726	0.88726	IDENTICAL
Z (Normal distribution)	((X ^ B) – 1) / B	0.98194	0.98194	0.95124	0.95124	0.94878	0.94878	0.83778	0.83778	IDENTICAL
T (Student's distribution)	X ^ C	0.98113	0.98113	0.95581	0.95581	0.94329	0.94329	0.82057	0.82057	IDENTICAL
LN (F)	LN (X + D)	0.96881	0.96881	0.91839	0.91839	0.95590	0.95590	0.93244	0.93244	IDENTICAL
THREE PARAMETER	1 / (X + E)	0.75135	0.75135	0.75333	0.75333	0.56119	0.56119	0.79376	0.79376	IDENTICAL
WEIBULL (standardized)	SQRT (X + A)	0.97433	0.97433	0.91688	0.91688	0.96110	0.96110	0.93794	0.93794	IDENTICAL
EXPONENTIAL	((X ^ B) – 1) / B	0.96715	0.96715	0.89297	0.89297	0.86491	0.86491	0.84275	0.84275	IDENTICAL
CUMULATIVE HAZARD	X ^ C	0.96313	0.96313	0.89718	0.89718	0.86197	0.86197	0.84243	0.84243	IDENTICAL
LOGISTIC	LN (X + D)	0.94892	0.94892	0.90225	0.90225	0.92385	0.92385	0.95042	0.95042	IDENTICAL
CHI-SQUARE	1 / (X + E)	0.94587	0.94587	0.88644	0.88644	0.92292	0.92292	0.95675	0.95675	IDENTICAL
LARGEST EXTREME VALUE	SQRT (X + A)	0.91187	0.91187	0.86298	0.86298	0.85984	0.85984	0.91914	0.91914	IDENTICAL
LAPLACE	X ^ C	0.97395	0.97395	0.94973	0.94973	0.93123	0.93123	0.80127	0.80127	IDENTICAL
CAUCHY	1 / (X + E)	0.93440	0.93440	0.95804	0.95804	0.62394	0.62394	0.54149	0.54149	IDENTICAL

		Comparison of **% Reliability** (i.e., % of the population that is above specification limit) outputted by both versions (8 more significant digits not showing but used for comparison calculation)								
		Data Set A (n=10)		Data Set D (n=30)		Data Set C (n=200)		Data Set H (n=600)		v5.01 = v4.06 in all cases?
Y-AXIS TRANSFORMATION	X-AXIS TRANSFORMATION	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	
F (untransformed)	SQRT (X + A)	46.79052%	46.79052%	59.89760%	59.89760%	See message below.	See message below.	79.91351%	79.91351%	IDENTICAL
Z (Normal distribution)	((X ^ B) – 1) / B	59.15384%	59.15384%	71.09635%	71.09635%	96.36934%	96.36934%	84.82131%	84.82131%	IDENTICAL
T (Student's distribution)	X ^ C	59.61086%	59.61086%	72.63241%	72.63241%	96.15704%	96.15704%	86.65144%	86.65144%	IDENTICAL
LN (F)	LN (X + D)	58.29285%	58.29285%	70.39453%	70.39453%	98.16130%	98.16130%	90.22282%	90.22282%	IDENTICAL
THREE PARAMETER	1 / (X + E)	25.59121%	25.59121%	53.32148%	53.32148%	See message below.	See message below.	74.53152%	74.53152%	IDENTICAL
WEIBULL (standardized)	SQRT (X + A)	54.32107%	54.32107%	68.65147%	68.65147%	98.47825%	98.47825%	89.66216%	89.66216%	IDENTICAL
EXPONENTIAL	((X ^ B) – 1) / B	46.77332%	46.77332%	60.51782%	60.51782%	See message below.	See message below.	77.44567%	77.44567%	IDENTICAL
CUMULATIVE HAZARD	X ^ C	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	IDENTICAL
LOGISTIC	LN (X + D)	45.72529%	45.72529%	65.72111%	65.72111%	99.46606%	99.46606%	88.94327%	88.94327%	IDENTICAL
CHI-SQUARE	1 / (X + E)	46.74654%	46.74654%	64.85578%	64.85578%	99.73274%	99.73274%	87.81064%	87.81064%	IDENTICAL
LARGEST EXTREME VALUE	SQRT (X + A)	39.39336%	39.39336%	61.02131%	61.02131%	99.99963%	99.99963%	84.88283%	84.88283%	IDENTICAL
LAPLACE	X ^ C	61.28433%	61.28433%	75.44214%	75.44214%	95.58610%	95.58610%	88.09694%	88.09694%	IDENTICAL
CAUCHY	1 / (X + E)	36.90922%	36.90922%	78.20584%	78.20584%	98.57159%	98.57159%	96.70227%	96.70227%	IDENTICAL

PART (1b) **PER THE PROTOCOL (before being pasted into RPv5.01 data entry table, all data randomized, using Excel's "Rand()" function; data entered into RPv4.06 as described above for Part (1a)).**

		Comparison of **Correlation Coefficient** outputted by both versions								
		Data Set A (n=10)		Data Set W (n=10)		Data Set C (n=200)		Data Set E (n=200)		v5.01 = v4.06 in all cases?
Y-AXIS TRANSFORMATION	X-AXIS TRANSFORMATION	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	
F (untransformed)	SQRT (X + A)	0.93639	0.93639	0.73096	0.73096	0.90557	0.90557	0.99825	0.99825	IDENTICAL
Z (Normal distribution)	((X ^ B) – 1) / B	0.98194	0.98194	0.91766	0.91766	0.94878	0.94878	0.97628	0.97628	IDENTICAL
T (Student's distribution)	X ^ C	0.98113	0.98113	0.91956	0.91956	0.94329	0.94329	0.95602	0.95602	IDENTICAL
LN (F)	LN (X + D)	0.96881	0.96881	0.87423	0.87423	0.95590	0.95590	0.89234	0.89234	IDENTICAL
THREE PARAMETER	1 / (X + E)	0.75135	0.75135	0.38534	0.38534	0.56119	0.56119	0.72266	0.72266	IDENTICAL
WEIBULL (standardized)	SQRT (X + A)	0.97433	0.97433	0.85158	0.85158	0.96110	0.96110	0.94913	0.94913	IDENTICAL
EXPONENTIAL	((X ^ B) – 1) / B	0.96715	0.96715	0.74813	0.74813	0.86491	0.86491	0.86925	0.86925	IDENTICAL
CUMULATIVE HAZARD	X ^ C	0.96313	0.96313	0.73857	0.73857	0.86197	0.86197	0.86480	0.86480	IDENTICAL
LOGISTIC	LN (X + D)	0.94892	0.94892	0.72954	0.72954	0.92385	0.92385	0.95802	0.95802	IDENTICAL
CHI-SQUARE	1 / (X + E)	0.94587	0.94587	0.68887	0.68887	0.92292	0.92292	0.97451	0.97451	IDENTICAL
LARGEST EXTREME VALUE	SQRT (X + A)	0.91187	0.91187	0.67444	0.67444	0.85984	0.85984	0.93160	0.93160	IDENTICAL
LAPLACE	X ^ C	0.97395	0.97395	0.92038	0.92038	0.93123	0.93123	0.92451	0.92451	IDENTICAL
CAUCHY	1 / (X + E)	0.93440	0.93440	0.73133	0.73133	0.62394	0.62394	0.47729	0.47729	IDENTICAL

		Comparison of **% Reliability** (i.e., % of the population that is above specification limit) outputted by both versions (8 more significant digits not showing but used for comparison calculation)								
		Data Set A (n=10)		Data Set W (n=10)		Data Set C (n=200)		Data Set E (n=200)		v5.01 = v4.06 in all cases?
Y-AXIS TRANSFORMATION	X-AXIS TRANSFORMATION	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	RP v4.06	RP v5.01	
F (untransformed)	SQRT (X + A)	46.79052%	46.79052%	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	IDENTICAL
Z (Normal distribution)	((X ^ B) – 1) / B	59.15384%	59.15384%	90.63156%	90.63156%	96.36934%	96.36934%	100.00000%	100.00000%	IDENTICAL
T (Student's distribution)	X ^ C	59.61086%	59.61086%	90.72667%	90.72667%	96.15704%	96.15704%	99.99364%	99.99364%	IDENTICAL
LN (F)	LN (X + D)	58.29285%	58.29285%	86.50661%	86.50661%	98.16130%	98.16130%	99.99501%	99.99501%	IDENTICAL
THREE PARAMETER	1 / (X + E)	25.59121%	25.59121%	21.21144%	21.21144%	See message below.	See message below.	See message below.	See message below.	IDENTICAL
WEIBULL (standardized)	SQRT (X + A)	54.32107%	54.32107%	85.67909%	85.67909%	98.47825%	98.47825%	99.99960%	99.99960%	IDENTICAL
EXPONENTIAL	((X ^ B) – 1) / B	46.77332%	46.77332%	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	IDENTICAL
CUMULATIVE HAZARD	X ^ C	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	See message below.	IDENTICAL
LOGISTIC	LN (X + D)	45.72529%	45.72529%	72.04085%	72.04085%	99.46606%	99.46606%	100.00000%	100.00000%	IDENTICAL
CHI-SQUARE	1 / (X + E)	46.74654%	46.74654%	65.42782%	65.42782%	99.73274%	99.73274%	See message below.	See message below.	IDENTICAL
LARGEST EXTREME VALUE	SQRT (X + A)	39.39336%	39.39336%	59.82789%	59.82789%	99.99963%	99.99963%	See message below.	See message below.	IDENTICAL
LAPLACE	X ^ C	61.28433%	61.28433%	90.49075%	90.49075%	95.58610%	95.58610%	99.99115%	99.99115%	IDENTICAL
CAUCHY	1 / (X + E)	36.90922%	36.90922%	79.00049%	79.00049%	98.57159%	98.57159%	99.35158%	99.35158%	IDENTICAL

PART (2) PER THE PROTOCOL

All comparisons done using Excel. That is, to compare 2 columns of text (e.g. columns X and Y), the following formula would be used:

= IF (X1 = Y1 , "identical", "NOT IDENTICAL")

where X1 and Y1 are a pair of results (in this case, results from v5 and v4 equal a pair).

Such a formula was used to compare each output cell in RPv5.01 to that in RPv4.06. If the values, order, and associated transformations are not identical between v5 and v4.

The transformation pairing used for all comparisons was

	Data is in numerical order in both v4 and v5 Data Entry tables		Data randomize in v5 Data Entry table (see Part 2b, above) but in numerical order for v4	
DISPLAY OPTION:	For Data Set A (n=10), does... v5,01 = v4.06 in all cases?	For Data Set C (n=200), does... v5,01 = v4.06 in all cases?	For Data Set A (n=10), does... v5,01 = v4.06 in all cases?	For Data Set C (n=200), does... v5,01 = v4.06 in all cases?
(a) "All possible Y-axis and X-axis transformation pairings"	IDENTICAL	IDENTICAL	IDENTICAL	IDENTICAL
(b) "X-axis transformations that include A, B, C, D, or E, only"	IDENTICAL	IDENTICAL	IDENTICAL	IDENTICAL
(c) "X-axis transformations that do NOT include A, B, C, D, or E"	IDENTICAL	IDENTICAL	IDENTICAL	IDENTICAL
(d) "X(untransformed), only"	IDENTICAL	IDENTICAL	IDENTICAL	IDENTICAL
(e) "Z(Normal distribution) transformation, only"	IDENTICAL	IDENTICAL	IDENTICAL	IDENTICAL

PART (3) PER THE PROTOCOL

	Values entered into Solver Worksheet				Values appearing on Preliminary Analysis Worksheet				Preliminary Analysis = Solver, in all cases?
Constant A	-100	-1	1	100	-100	-1	1	100	IDENTICAL
Constant B	-90	-2	2	200	-90	-2	2	200	IDENTICAL
Constant C	-80	-3	3	300	-80	-3	3	300	IDENTICAL
Constant D	-70	-4	4	400	-70	-4	4	400	IDENTICAL
Constant E	-60	-5	5	500	-60	-5	5	500	IDENTICAL