NUREG/CR-4461, Rev. 2
PNNL-15112, Rev. 1

Tornado Climatology of the Contiguous United States

Pacific Northwest National Laboratory

U.S. Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Washington, DC 20555-0001

AVAILABILITY OF REFERENCE MATERIALS IN NRC PUBLICATIONS

NRC Reference Material

As of November 1999, you may electronically access NUREG-series publications and other NRC records at NRC's Public Electronic Reading Room at http://www.nrc.gov/reading-rm.html. Publicly released records include, to name a few, NUREG-series publications; *Federal Register* notices; applicant, licensee, and vendor documents and correspondence; NRC correspondence and internal memoranda; bulletins and information notices; inspection and investigative reports; licensee event reports; and Commission papers and their attachments.

NRC publications in the NUREG series, NRC regulations, and *Title 10, Energy*, in the Code of *Federal Regulations* may also be purchased from one of these two sources.

1. The Superintendent of Documents
   U.S. Government Printing Office
   Mail Stop SSOP
   Washington, DC 20402–0001
   Internet: bookstore.gpo.gov
   Telephone: 202-512-1800
   Fax: 202-512-2250
2. The National Technical Information Service
   Springfield, VA 22161–0002
   www.ntis.gov
   1–800–553–6847 or, locally, 703–605–6000

A single copy of each NRC draft report for comment is available free, to the extent of supply, upon written request as follows:
Address: Office of Administration,
Reproduction and Distribution
Services Section,
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
E-mail: DISTRIBUTION@nrc.gov
Facsimile: 301–415–2289

Some publications in the NUREG series that are posted at NRC's Web site address http://www.nrc.gov/reading-rm/doc-collections/nuregs are updated periodically and may differ from the last printed version. Although references to material found on a Web site bear the date the material was accessed, the material available on the date cited may subsequently be removed from the site.

Non-NRC Reference Material

Documents available from public and special technical libraries include all open literature items, such as books, journal articles, and transactions, *Federal Register* notices, Federal and State legislation, and congressional reports. Such documents as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings may be purchased from their sponsoring organization.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at—
The NRC Technical Library
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852–2738

These standards are available in the library for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from—
American National Standards Institute
11 West 42nd Street
New York, NY 10036–8002
www.ansi.org
212–642–4900

Legally binding regulatory requirements are stated only in laws; NRC regulations; licenses, including technical specifications; or orders, not in NUREG-series publications. The views expressed in contractor-prepared publications in this series are not necessarily those of the NRC.

The NUREG series comprises (1) technical and administrative reports and books prepared by the staff (NUREG–XXXX) or agency contractors (NUREG/CR–XXXX), (2) proceedings of conferences (NUREG/CP–XXXX), (3) reports resulting from international agreements (NUREG/IA–XXXX), (4) brochures (NUREG/BR–XXXX), and (5) compilations of legal decisions and orders of the Commission and Atomic and Safety Licensing Boards and of Directors' decisions under Section 2.206 of NRC's regulations (NUREG–0750).

DISCLAIMER: This report was prepared as an account of work sponsored by an agency of the U.S. Government. Neither the U.S. Government nor any agency thereof, nor any employee, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for any third party's use, or the results of such use, of any information, apparatus, product, or process disclosed in this publication, or represents that its use by such third party would not infringe privately owned rights.

NUREG/CR-4461, Rev. 2
PNNL-15112, Rev. 1

Tornado Climatology of the Contiguous United States

Manuscript Completed: December 2006
Date Published: February 2007

Prepared by
J.V. Ramsdell, Jr.
J.P. Rishel

Pacific Northwest National Laboratory
P.O. Box 999
Richland, WA 99352

A.J. Buslik, NRC Project Manager

Prepared for
Division of Risk Assessment and Special Projects
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
NRC Job Code N6337

Abstract

Characteristics of tornadoes reported in the contiguous United States from January 1950 through August 2003 have been used to determine tornado strike probabilities and maximum wind speeds for use in nuclear power plant design. Maps have been prepared that show the distribution of tornado events and design wind speeds. Appendices contain the number of tornadoes and estimates of strike probabilities and maximum wind speeds by 1°, 2°, and 4° latitude and longitude boxes.

The methods used in this analysis are identical to those used in the analysis leading to publication of the tornado climatology in NUREG/CR-4461, Rev. 1. The primary difference between the climatology presented here and the climatology in Rev. 1 is that wind speed estimates in this climatology are based on the Enhanced Fujita Scale that correlates wind speeds with damage caused by tornadoes. These wind speeds are significantly lower than the wind speeds in the original Fujita Scale. A second difference is that the wind speeds in the Enhanced Fujita Scale are nominally 3-second average wind speeds, whereas the wind speeds in the original Fujita Scale were nominally the fastest quarter-mile wind speeds. The National Weather Service intends to implement the Enhanced Fujita Scale by February 2007.

The results of this analysis indicate that a maximum wind speed of about 230 mph is appropriate for tornadoes with a best estimate probability of 10^{-7} per year for the central portion of the United States; a maximum wind speed of 200 mph is appropriate for a region of the United States along the east coast, and the western great plains; and a maximum wind speed of 160 mph is appropriate for the western United States. Corresponding wind speeds in NUREG/CR-4461, Rev. 1, were 300 mph, 260 mph, and 200 mph, respectively.

FOREWORD

The Nuclear Regulatory Commission is revising Regulatory Guide 1.76, "Design Basis Tornado for Nuclear Power Plants." (The revision also includes information about tornado missiles and is entitled "Design-basis Tornado and Tornado Missiles for Nuclear Power Plants.") The present report, NUREG/CR-4461, Rev. 2, was written to support this effort, and is based on much more tornado data than the data used in support of the original version of Regulatory Guide 1.76, which was published in 1974. The present report uses data on tornadoes which were reported in the contiguous United States from January 1950 through August 2003, 50.67 years of data. Moreover, the methodology was changed by including a term to account for the finite dimensions of structures, and by accounting for the variation of wind speeds along and across the tornado footprint. In these respects, the present report is similar to Revision 1 of this report, published in April 2005. The major difference between the present report and NUREG/CR-4461, Rev. 1, is that wind speed estimates in the present report are based on the Enhanced Fujita Scale that correlates wind speeds with damage caused by tornadoes, while the wind speed estimates in NUREG/CR-4461, Rev. 1, were based on the original Fujita Scale. The Enhanced Fujita Scale was approved for use in February 2006, and it is scheduled for implementation in February 2007. The wind speed estimates based on the Enhanced Fujita Scale are considerably lower than those based on the Fujita scale.

One of the defining characteristics of the design-basis tornado is that its frequency of exceedance is 1×10^{-7} per year. The contiguous United States is divided into three regions. Using the results of the present report, the maximum wind speed of the design-basis tornado in Region I is 230 mph, in Region II is 200 mph, and in Region III is 160 mph. The original version of Regulatory Guide 1.76 also used three regions, but these regions did not coincide with the regions now used. The region of the original version of this guide with the highest design-basis tornado wind speed had a design-basis wind speed of 360 mph. This is to be contrasted with the current highest design-basis tornado wind speed of 230 mph.

Brian W. Sheron, Director
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission

Contents

Abstract iii
Foreword v
Executive Summary xi
Acronyms, Abbreviations, and Symbols xiii
1.0 Introduction 1-1
2.0 Tornado Data 2-1
2.1 Tornado Intensities 2-2
2.2 United States Tornado Characteristics 2-3
2.3 Regional Tornado Characteristics 2-11
3.0 Adjustments to the Tornado Data 3-1
3.1 Unreported Tornadoes 3-1
3.2 Variation of Wind Speed Within the Impact Area 3-3
4.0 Tornado Model 4-1
4.1 Point Structures 4-1
4.2 Large Structures 4-3
4.3 Total Strike Probability and Design Wind Speed 4-4
5.0 Analytical Results 5-1
5.1 Contiguous United States and Regions 5-1
5.2 Subregional Results 5-5
6.0 Comparison of Results 6-1
7.0 Uncertainty 7-1
7.1 Tornado Footprint Model 7-1
7.2 Length, Width, and Area 7-1
7.3 F Scale 7-3
7.4 Association of Wind Speeds with F Scales 7-4
7.5 Natural Variation in Tornado Dimensions 7-5
8.0 Recommendations 8-1
9.0 References 9-1
Appendix A – Results for 2° Boxes A-1
Appendix B – Results for 4° Boxes B-1
Appendix C – Results for 1° Boxes C-1

Figures

2-1 Distribution of Tornado Events in the Contiguous United States by 1° Latitude and Longitude Boxes (1950 through August 2003) 2-8
2-2 Distribution of Tornado Events with Intensities of F2 or Greater in the Contiguous United States by 1° Latitude and Longitude Boxes (1950 through August 2003) 2-9
2-3 Distribution of Tornado Events with Intensities of F4 or Greater in the Contiguous United States by 1° Latitude and Longitude Boxes (1950 through August 2003) 2-10

3-1 Annual Number of Reported Tornadoes (1950 through August 2003) 3-1
3-2 Number of F0 Tornadoes and Total Number of F1 through F5 Tornadoes by Year Since 1950 3-2
3-3 Wind Speed Probability With and Without Correction for Unreported F0 Tornadoes 3-3

5-1 Comparison of Conditional Wind Speed Probabilities Calculated for the Contiguous United States and for the Western, Central, and Eastern Regions 5-2
5-2 Comparison of Wind Speed Probabilities for Point Structures in the Western, Central, and Eastern Regions 5-3
5-3 Comparison of Wind Speed Probabilities Associated with the Life-Line Term for Large Structures in the Western, Central, and Eastern Regions 5-3
5-4 Maximum Wind Speed Probability for a 200-ft Structure in the Western United States Showing the 90 Percent Confidence Interval 5-4
5-5 Maximum Wind Speed Probability for a 200-ft Structure in the Central United States Showing the 90 Percent Confidence Interval 5-4
5-6 Maximum Wind Speed Probability for a 200-ft Structure in the Eastern United States Showing the 90 Percent Confidence Interval 5-5
5-7 Number of Tornado Events in the United States From 1950 through August 2003 by 2° Boxes 5-6
5-8 Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 2° Boxes 5-7
5-9 Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 2° Boxes 5-7
5-10 Expected Maximum Tornado Wind Speeds with a 10^{-6} yr^{-1} Probability of Occurrence by 2° Boxes 5-8
5-11 Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-6} yr^{-1} Probability of Occurrence by 2° Boxes 5-8
5-12 Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 2° Boxes 5-9
5-13 Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 2° Boxes 5-9
5-14 Number of Tornado Events in the United States From 1950 through August 2003 by 4° Boxes 5-10

5-15 Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 4° Boxes. 5-11
5-16 Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 4° Boxes. 5-11
5-17 Expected Maximum Tornado Wind Speeds with a 10^{-6} yr^{-1} Probability of Occurrence by 4° Boxes. 5-12
5-18 Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-6} yr^{-1} Probability of Occurrence by 4° Boxes. 5-12
5-19 Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 4° Boxes. 5-13
5-20 Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 4° Boxes. 5-13

6-1 Comparison of 10^{-7} yr^{-1} Probability Level Wind Speeds Estimated for United States Nuclear Power Plant Sites.. 6-4
6-2 Comparison of 10^{-7} yr^{-1} Probability Level Wind Speeds Estimated for Representative Cities in United States.. 6-6

7-1 Comparison Tornado Maximum Wind Speed Probability Estimates Resulting from Use of Five Relationships Between F Scale and Wind Speed. 7-5

8-1 Recommended Tornado Design Wind Speeds for the 10^{-5} yr^{-1} Probability Level.. 8-1
8-2 Recommended Tornado Design Wind Speeds for the 10^{-6} yr^{-1} Probability Level.. 8-2
8-3 Recommended Tornado Design Wind Speeds for the 10^{-7} yr^{-1} Probability Level.. 8-2

Tables

2-1 Fujita Tornado F Scale Intensity Wind Speed Relationships 2-2
2-2 Tornado Segment Statistics for the Contiguous United States 2-6
2-3 Distribution of Tornado Segment Lengths in the Contiguous United States 2-6
2-4 Distribution of Tornado Segment Widths in the Contiguous United States 2-7
2-5 Distribution of Tornado Segment Areas in the Contiguous United States 2-7
2-6 Tornado Segment Statistics for the Western United States 2-11
2-7 Distribution of Tornado Segment Lengths in the Western United States 2-12
2-8 Distribution of Tornado Segment Widths in the Western United States 2-12
2-9 Distribution of Tornado Segment Areas in the Western United States 2-12
2-10 Tornado Segment Statistics for the Central United States 2-13
2-11 Distribution of Tornado Segment Lengths in the Central United States 2-14
2-12 Distribution of Tornado Segment Widths in the Central United States 2-14
2-13 Distribution of Tornado Segment Areas in the Central United States 2-14
2-14 Tornado Segment Statistics for the Eastern United States 2-15
2-15 Distribution of Tornado Segment Lengths in the Eastern United States 2-16
2-16 Distribution of Tornado Segment Widths in the Eastern United States 2-16
2-17 Distribution of Tornado Segment Areas in the Eastern United States 2-16

3-1 Tornado Area Intensity Distribution for the Point Structure Design Wind Speed Estimates 3-4
3-2 Area Impacted by Tornadoes in the Contiguous United States 3-5
3-3 Tornado Length Intensity Distribution for the Finite-Structure Design Wind Speed Estimates 3-6

5-1 Calculated Tornado Model Parameters 5-1

6-1 Tornado Wind Speed Estimates for United States Nuclear Power Plant Sites 6-2
6-2 Tornado Wind Speed Estimates for Representative Cities in the United States 6-5

7-1 Changes in Tornado Impact Statistics Associated with Compensation for Potential Classification Errors 7-3
7-2 Tornado F Scale Intensity Wind Speed Relationships 7-4

8-1 Recommended Tornado Design Wind Speeds 8-3

Executive Summary

A revised tornado climatology for the contiguous United States (NUREG/CR-4461, Rev. 1) published in April 2005 summarized tornado information reported for the contiguous United States based on information for more than 46,800 tornado segments occurring from January 1, 1950, through August 2003. More than 39,600 of these segments had sufficient information on location, intensity, length, and width to be used in the analysis presented in the report.

Subsequently, the National Weather Service announced that in February 2007 it intends to switch from using the Fujita Scale, which relates damage caused by tornadoes to tornado wind speeds, to using the Enhanced Fujita Scale. Included in this switch are 1) changing the averaging interval for wind speed estimates from the fastest quarter-mile wind speed to a maximum 3-second average wind speed, 2) changing the minimum tornado wind speed from 40 mph to 65 mph, and 3) changing the wind speed intervals associated with each F Scale class.

This report examines the implications of switching from the Fujita Scale to the Enhanced Fujita Scale on design wind speed estimates for tornadoes. The first two of the changes tend to increase design wind speeds; however, the increases in wind speeds associated with these changes are small compared with the decreases in wind speed associated with the changes in wind speed intervals. The net effect of the changes is a reduction of design wind speed of 50 to 70 mph in large portions of the United States.

Specifically, Chapter 5 of this report has been revised to show 10^{-5}, 10^{-6}, and 10^{-7} yr^{-1} probability design wind speeds for the contiguous United States estimated using the January 1950 through August 2003 database and the Enhanced Fujita Scale. Chapter 6 has been revised to show the potential changes in design wind speed for nuclear power plant sites and for various cities throughout the country.

Characteristics of tornadoes that are not related to wind speed are not affected by switching to the Enhanced Fujita Scale. Consequently, the characteristics summarized in Chapter 2 of this report are not changed from the previous report. The summary for the contiguous United States is followed by separate summaries for western, central, and eastern regions of the United States. Each summary includes the number of events, and the median, average, and expected values for length, width, and area. In addition, the summaries include the lower and upper limits for the 90 percent confidence intervals for the expected values. Lognormal distributions were assumed for tornado event lengths, widths, and areas in calculation of the expected values and the confidence intervals for the expected values.

Chapter 3 of the report evaluates two potential adjustments to the data. The average number of tornadoes reported each year has been increasing since at least 1950. The NCDC data confirm this trend but indicate that the increase is limited to the least intense tornadoes. Evaluation of the consequences of unreported tornadoes in Chapter 3 suggests that the unreported tornadoes may be neglected without a significant effect on estimates of strike probabilities or maximum wind speeds. As a result, no attempt is made to account for unreported tornadoes. Variation of the maximum wind speed along and across the tornado footprint is discussed, and the method used to account for this variation is described. Small numerical changes have

been made in the factors used to account for the variation of wind speed across the tornado footprint that are related to switching to the Enhanced Fujita Scale, but the method of accounting for the variation of wind speed along and across the footprint is otherwise unchanged.

Chapter 4 describes the methods of estimating the tornado strike probabilities and the conditional probability that the maximum wind speed will exceed a specified value assuming that a tornado strike occurs. Methods are described for point structures and for finite-sized structures. The methods used for point and finite structures are the same as in the analysis NUREG/CR-4461, Rev. 1.

Maximum wind speed estimates are presented in Chapter 5 and in Appendices A, B, and C. The distribution of maximum wind speed estimates are presented for large regions and by 1°, 2°, and 4° latitude and longitude boxes. The wind speed patterns shown in the figures in Chapter 5 are similar to the patterns presented in the initial version of NUREG/CR-4461, but the wind speeds are generally significantly lower.

Chapter 6 presents a comparison of tornado wind speeds estimated assuming the Enhanced Fujita Scale with those estimated assuming the original Fujita Scale. Two sets of comparisons are presented. The first is for United States nuclear power plant sites, and the other is for representative cities throughout the United States.

Chapter 7 discusses sources of uncertainty in the analysis. The first part of the chapter considers the uncertainty associated with the model used to characterize tornado footprints. Next, the chapter discusses uncertainty in the estimation of tornado characteristics. The length, width, and intensity of a tornado are estimated subjectively from damage caused by the tornado and are all subject to error. Two methods for adjustment of data to account for potential errors in classification of tornado intensity are discussed. They are shown to alter some of the basic tornado statistics, such as total area impacted by and total length of tornadoes, and are therefore rejected for this study. Four relationships between damage classification and maximum wind are discussed. Finally, the uncertainty associated with the statistical variation in tornado dimensions and intensity is discussed. The source of uncertainty is also dealt with in Chapter 2 and is considered in assigning confidence intervals to strike probabilities and maximum wind speeds.

Finally, Chapter 8 provides recommendations on design criteria for tornadoes should the NRC staff choose to implement the Enhanced Fujita Scale. These recommendations are based on the maximum wind speeds for the 2° boxes, but also consider the number of tornadoes and population density. For the 10^{-7} yr^{-1} probability level, a design wind speed of 230 mph is recommended for a large region in the central United States; a design wind speed of 200 mph is recommended for the western portion of the Great Plains and for the east coast; and a design wind speed of 160 mph is recommended for the western United States. The corresponding wind speeds recommended in NUREG/CR-4461, Rev. 1, based on the original Fujita Scale were 300 mph, 260 mph, and 200 mph, respectively.

Acronyms, Abbreviations, and Symbols

a_l	scale parameter for the Weibull distribution function for the conditional life-line strike probability
a_p	scale parameter for the Weibull distribution function for the conditional point strike probability
A_r	area of a region of interest, e.g., the contiguous United States, or the area of a 2° latitude and longitude box
A_t	total area impacted by tornadoes within a region of interest in N years
$A_{u \geq u_o}$	tornado impact area with wind speed, u, greater than some threshold speed, u_o
AEC	U.S. Atomic Energy Commission
b_l	shape parameter for the Weibull distribution function for the conditional life-line strike probability
b_p	shape parameter for the Weibull distribution function for the conditional point strike probability
EF	Enhanced Fujita Scale relating tornado damage and estimated maximum wind speed
E(x)	expected value of a variable x
Exp(x)	exponential of x, i.e., e^x
F	Fujita Scale relating tornado damage and estimated maximum wind speed
f(x)	probability density function for a variable x
ft	feet
$L_{u \geq u_o}$	total tornado path length in a region of interest with wind speed, u, greater than some threshold speed, u_o
L_t	total tornado path length in a region of interest regardless of wind speed

Lat.	latitude
Long.	longitude
LLNL	Lawrence Livermore National Laboratory
mi	miles
mph	miles per hour
N	number of years of tornado record used to determine A_t
NCDC	National Climatic Data Center
P_l	finite-structure strike probability for a tornado, regardless of wind speed
$P_l(u \geq u_o)$	finite-structure strike probability for a tornado with a wind speed, u, greater than some threshold speed, u_o
$P_l(u \geq u_o \mid s)$	conditional finite-structure strike probability for a tornado with a wind speed, u, greater than some threshold speed, u_o, assuming that a strike occurs
P_p	point-structure strike probability for a tornado, regardless of wind speed
$P_p(u \geq u_o)$	point-structure strike probability for a tornado with a wind speed, u, greater than some threshold speed, u_o
$P_p(u \geq u_o \mid s)$	conditional point-structure strike probability for a tornado with a wind speed, u, greater than some threshold speed, u_o, assuming that a strike occurs
TorBoxes	computer program used for regional tornado analyses
TorStrk	computer program used for site-specific tornado analyses
u_o	threshold wind speed or wind speed of interest
V[w]	variance of a variable w
w_s	characteristic horizontal dimension of a finite structure, assumed to be 200 ft for this analysis
yr	year

1.0 Introduction

Among the missions of the U.S. Nuclear Regulatory Commission (NRC) is the protection of public health and safety and the environment from the effects of radiation from nuclear reactors, materials, and waste facilities. In performing this mission, the NRC evaluates the consequences of events external to nuclear facilities that may lead to release of radioactive materials to the environment. Tornadoes are among the external events of interest.

Current NRC guidance on tornado characteristics for consideration in the design of nuclear power plants is found in Regulatory Guide 1.76 (AEC 1974). This guidance is based on a summary of information from a variety of sources called WASH-1300 (Markee et al. 1974). In the initial version of NUREG/CR-4461, Ramsdell and Andrews (1986) summarized data on tornadoes that occurred from January 1954 through December 1983 and were listed in a tornado database maintained by the National Severe Storms Forecast Center.

Revision 1 of NUREG/CR-4461 updates the 1986 report using tornado data collected from January 1, 1950, through August 2003. It contains statistics on tornado dimensions and wind speeds by region of the country, and estimates of strike probabilities and design wind speeds by boxes with sides of 1°, 2°, and 4° of latitude and longitude. Following completion of NUREG/CR-4461, Rev. 1, the NRC staff prepared a draft Regulatory Guide (DG-1143) to update Regulatory Guide 1.76 to reflect more recent tornado data and published it for comment on February 2, 2006. At about the same time, the National Weather Service decided to use the Enhanced Fujita Scale relating tornado damage to maximum wind speed beginning February 1, 2007. Significant public comment on DG-1143 suggested that the update to RG-1.76 be based on the Enhanced Fujita Scale rather than the original Fujita Scale (TTU 2006; NOAA 2006).

This report examines the effects on tornado characteristics of changing from the original Fujita Scale to the Enhanced Fujita Scale. Those characteristics that are not an explicit function of wind speed, such as the number of events, distribution within the United States, footprint length and width, and strike probability, are not affected by switching to the Enhanced Fujita Scale. On the other hand, those characteristics that are directly related to wind speed, such as the probability of exceeding a given wind speed at a point should the point be struck by a tornado, are significantly impacted by the switch. The report does not examine other implications of the switch that could result from reduction of tornado design wind speeds, such as the possible increase in importance of winds associated with hurricanes.

The characteristics of tornadoes in the contiguous United States are presented in Chapter 2, along with the particular characteristics of the western, central, and eastern regions. Chapters 3 and 4 discuss methodological issues: Chapter 3 focuses on possible adjustments to the available data, and Chapter 4

describes methods used here for estimating strike probabilities and maximum wind speeds for point structures and structures of finite dimensions. Chapter 5 gives results of the analysis, and Chapter 6 compares maximum wind speeds estimated using the Enhanced Fujita Scale with estimates made using the original Fujita Scale. Chapter 7 discusses uncertainty in the data and the analysis. Finally, Chapter 8 suggests structural design criteria by region, considering the numbers of tornadoes, maximum wind speed estimates, and population densities, should the NRC staff choose to implement the Enhanced Fujita Scale.

2.0 Tornado Data

The tornado database used to prepare the initial version of NUREG/CR-4461 was maintained by the National Severe Storms Forecast Center in Kansas City, Missouri, which is operated by the National Weather Service. Since then, the responsibility for maintaining the list of tornadoes has been transferred to the National Climatic Data Center (NCDC) in Asheville, North Carolina. The statistics for tornadoes striking the contiguous United States are now included in the storm events data base maintained by the NCDC.

In February 2004, a copy of the database was obtained from NCDC for use in updating NUREG/CR-4461. The database, which covers the period from January 1, 1950, through August 31, 2003, contains entries for 46,864 tornado segments. A tornado segment is a portion or all of a tornado. Prior to 1996, tornadoes were divided into segments when they entered or left a county in which there was an injury or fatality, or when they crossed a state boundary. Since 1996, tornadoes are now divided into segments when they cross a state or county line, when there are skips not exceeding 2 miles or 4 minutes travel, and when they have a sharp change in direction. Only about 10 percent of the tornadoes have more than one segment. Division of tornadoes into segments does not have a significant effect on the results of the analysis that follows.

Among the statistics included in the database for tornadoes are date, time, location, length, width, and maximum intensity (wind speed). Of these statistics, the most useful are the location, length, width, and maximum intensity. If these four elements are present, data for the event can be used in all aspects of the analysis. If the location and intensity are listed, the tornado will not be used in estimating tornado dimensions, but it will be counted and used in estimating strike probabilities.

The area of the tornado footprint used in the analysis is the product of the path width and length. The widths reported for tornado segments prior to 1994 were the mean path width. These widths are the appropriate widths for use in estimating the footprint area. Since 1994, the maximum path width has been reported. This change in definition of the width results in overestimates of the footprint area for the more recent tornadoes. No corrections have been applied to the widths reported since 1994 to account for the change in definition. As a result, widths of recent tornadoes provide a conservative bias to the estimates of strike probability in this analysis.

The data contained in the database are made available by the NCDC without warrantee, i.e., the information compiled in the database comes from several of sources with varying levels of reliability and much of the information about the tornadoes is based on subjective judgement. In the course of working with the data for this report, several inconsistencies (fewer than 20) were noted. For example, in several instances the reported lengths of tornado segments were inconsistent with the reported positions of the beginning and end points of the tornado segments. Elsewhere, the latitude and longitude of tornado segments were not consistent with the reported county and state. In these instances, the latitude and longitude of the starting point of the tornado were generally assumed be correct, unless they were unreasonable, e.g., in the middle of the Pacific Ocean. When the length of a tornado segment was

inconsistent with distance between the beginning and end points of the segment, the latitude and longitude of the beginning point, and the length were assumed to be correct. Overall, the database is in reasonably good condition and acceptable for use in this climatology.

2.1 Tornado Intensities

Most of the statistics in the database related to tornadoes are self-explanatory. The exception is the tornado intensity. The tornado database does not include estimates of the maximum wind speeds in tornadoes. However, it does include an estimate of tornado intensity in the form of an intensity scale that is based on the damage caused by the tornado. The most common tornado intensity scale developed by Fujita (1971, 1978) classifies tornado intensity in six F Scale classes, F0 to F5. Wind speeds are rarely measured by meteorological instruments. Instead, they are estimated from damage associated with the tornado. The range of wind speeds assigned to classes by Fujita is listed in Table 2-1. This range been extended from F5 through F12, which has the speed of sound as its upper limit (NCDC 2004). However, no tornado has been assigned an intensity of F6 or greater, and, because of the imprecision in estimating F-scale and wind speeds in tornadoes, there is some question whether an F6 or greater tornado would be identified if it did occur. According to NCDC (2004), the strongest tornadoes are in the F5 range.

Table 2-1. Fujita Tornado F Scale Intensity Wind Speed Relationships

Intensity	Description	Original Fujita Scale (Fastest quarter mile, mph)	Fujita Scale (3-s gust, mph)	Operational Enhanced Fujita Scale (3-s gust, mph)
F0	Light damage	40 to 72	45 to 78	65 to 85
F1	Moderate damage	73 to 112	79 to 117	86 to 110
F2	Considerable damage	113 to 157	118 to 161	111 to 135
F3	Severe damage	158 to 206	162 to 209	136 to 165
F4	Devastating damage	207 to 260	210 to 261	166 to 200
F5	Incredible damage	261 to 318	262 to 317	>200

It should be noted that the maximum wind speed associated with a tornado occurs for only a small fraction of the footprint and at any location for only a short period of time. Depending on the translational velocity of the tornado, a location might experience wind speeds near the maximum for 5 to 10 seconds.

The problems of tornado intensity from damage are well known. It is a subjective process. For example, damage estimates are limited by the nature of the area where the tornado strikes. If there is nothing to damage, there is no way to assign an F Scale. Similarly, where there are structures, the damage will depend on the nature of the construction.

In 2001, Texas Tech University Wind Science and Engineering Research Center organized a forum of scientists and engineers to consider alternatives to the Fujita Scale (TTU 2006). The Enhanced Fujita

Scale shown in Table 2-1 is the result of the forum's work. To determine the Enhanced Fujita Scale, 28 damage indicators with several degrees of damage for each indicator are used to estimate the wind speed impacting structures in the path of the tornado. The damage indicators are related to types of structure, while the degree of damage describes the type of damage observed. The Enhanced Fujita Scale is based on the highest wind speed estimated in the tornado path.

Tornado wind speeds are estimated, not measured. They are related to averaging periods corresponding to relevant wind data collected by the National Weather Service. The Fujita Scale winds are approximately fastest quarter-mile wind speeds. Presently, peak winds recorded by National Wind Service instruments are about 3-second averages. Thus, the Enhanced Fujita wind speeds are nominally 3-second averages. For fastest quarter-mile wind speeds less than 300 mph, the maximum 3-second gust will be higher than the fastest quarter-mile wind speed. Table 2-1 shows the equivalent 3-second gust wind speeds for the original Fujita Scale.

One of the constraints in development of the Enhanced Fujita Scale was to preserve the utility of the existing tornado database. As a result, there is a very high correlation between speeds associated with the Enhanced Fujita Scale and those of the original Fujita Scale. Several members of the forum used original Fujita Scale criteria to assign Fujita Scale categories to the degrees of damage of the Enhanced Fujita Scale. Linear regression of the wind speeds estimated by the two scales gave

$$S_{EF} = 0.6246 \cdot S_F + 36.393 \qquad (2\text{-}1)$$

where S_{EF} is the wind speed for the Enhanced Fujita Scale and SF is the wind speed (mph) for the original Fujita Scale adjusted to a 3-second average (TTU 2006).

The National Weather Service has announced it intention to adopt and implement the Enhanced Fujita Scale by February 20007 (NOAA 2006). Chapters 5, 6, and 8 of this report have been updated from the corresponding chapters in NUREG/CR-4461, Rev. 1, to reflect the change to the wind speeds associated with the Enhanced Fujita Scale. In general, the change results in decreases in tornado wind speeds ranging from about 30 mph in the western United States to about 70 mph in the central United States. Note that the damage classification is still based on criteria associated with the original Fujita Scale.

2.2 United States Tornado Characteristics

The initial step in estimation of tornado strike probabilities and characteristics for use in design of structures is the characterization of the reported tornadoes. Tornado dimensions tend to increase with tornado intensity, and weak tornadoes are more common than strong tornadoes. As a result, the distributions of tornado dimensions are skewed. The modes (most frequent) and medians (50th percentile values) of the distributions are smaller than the means (averages). Mean tornado characteristics are important because they are used in estimating the probability of a tornado strike, and, along with the tornado intensities, they are used to estimate design wind speeds.

Using simple arithmetic averages to estimate mean tornado characteristics from tornado tracks tends to result in underestimates of the true values because of the skewed nature of the distributions. This bias decreases as the number of tornadoes considered increases.

Underestimation of tornado dimensions leads to underestimation of tornado strike probabilities and other design characteristics. Consequently, another statistic is frequently used to estimate mean characteristics: the expected value of the distribution. The expected value is essentially a weighted average rather than an arithmetic average. The expected value of a random variable x (any tornado dimension) is defined as

$$E(x) = \int_{-\infty}^{\infty} xf(x)dx \qquad (2\text{-}2)$$

where f(x) is the probability density function for x. For skewed distributions, the expected value is a better estimate of the true mean than an arithmetic average if the form of the distribution is known because information about the distribution is used in calculating the expected value. That is, the expected value converges to the true mean faster than the arithmetic average.

Following a suggestion by Thom (1963), the lognormal probability density function has been assumed to represent tornado characteristics (Markee et al. 1974; AEC 1974; Schreck and Sandusky 1982; Ramsdell and Andrews 1986). The data in the current tornado database suggest that this assumption is reasonable. Thus, the lognormal assumption is used for the analyses that follow.

Johnson et al. (1994) contains a detailed description of the properties of the lognormal distribution. To determine tornado characteristics, the reported values are transformed by taking logarithms of the values. Then, the mean and variance of the transformed values are computed using the usual statistical method. Finally, the desired statistics are calculated by reversing the transformation.

Given the average, u, of the transformed values and the variance, v, the following statistics of the distribution can be estimated directly:

Expected value	=	$\mathrm{Exp}(\, u + v/2 \,)$	(2-3)
Mode	=	$\mathrm{Exp}(\, u - bv \,)$	(2-4)
Median	=	$\mathrm{Exp}(\, u \,)$	(2-5)
Lower limit (5%)	=	$\mathrm{Exp}(\, u - 1.645\, v^{1/2} \,)$	(2-6)
Upper limit (95%)	=	$\mathrm{Exp}(\, u + 1.645\, v^{1/2} \,)$	(2-7)

In addition, treating (u + v/2) as a random variable, w, the variance of w, V[w] is approximately

$$V[w] \approx v/n + \frac{v^2}{2(n-1)} \tag{2-8}$$

where n is the number of tornado events used to estimate u and v. For sufficiently large n, perhaps as small as 20, the 90 percent confidence interval for the expected value is approximately

$$\exp\{w - 1.645(V[x])^{1/2}\} < E[x] < \exp\{w + 1.645(V[w])\} \tag{2-9}$$

Equations (2-2) through (2-9) provide the bases for estimation of strike probabilities and the 5th and 95th percentile limits on the 90 percent confidence interval for the expected values.

Table 2-2 lists the characteristics of tornado segments in the contiguous United States, derived from the NCDC tornado data. The table shows that the 90 percent confidence interval in the expected values increases as the intensity increases. This increase is associated with the decrease in the number of segments as the intensity increases. Tables 2-3 through 2-5 list the distributions of tornado dimensions for all tornadoes and for tornadoes by reported tornado intensity.

The geographical distribution of tornado events in the United States between the beginning of 1950 and the end of August 2003 is shown in Figure 2-1. A tornado event is defined as a tornado occurrence within a defined area. A tornado segment in the NCDC database may be counted as an event in more than one area. However, for the boxes shown in Figure 2-1, fewer than 5 percent of the tornadoes contribute to events in more than one box. For larger boxes, this percentage decreases. For the 2° and 4° boxes that form the basis for the analysis in Chapter 5, the percentages of segments contributing to events in more than one box decrease to about 2.3 percent and 1.1 percent, respectively.

Each number in Figure 2-1 represents the number of tornado events occurring in a box that covers 1° of latitude by 1° of longitude. The latitude and longitude labels shown in the figure represent the latitude and longitude of the southeast corners of the boxes. The area covered by each box is a function of latitude. Along the southern border of the country, the area is approximately 4,000 mi^2; in the middle of the country, it is about 3,600 mi^2; and along the northern border, it is about 3,200 mi^2. Figures 2-2 and 2-3 show the geographical distributions of more intense tornadoes, with Figure 2-3 showing only the most intense tornadoes, i.e., those having F Scales of F4 and F5.

Table 2-2. Tornado Segment Statistics for the Contiguous United States

	Tornado Intensity					
	F0	**F1**	**F2**	**F3**	**F4**	**F5**
Total Number of Segments	17554	16076	9145	2903	1005	130
Number of Segments With Length	14876	13437	7680	2678	956	120
Median (mi)	0.359	1.244	3.091	6.472	9.360	11.697
Average (mi)	1.140	3.376	6.633	10.495	13.442	14.945
5th Percentile (mi)[(a)]	0.830	3.489	7.791	11.728	13.563	13.726
Expected Value (mi)[(b)]	0.851	3.594	8.080	12.281	14.387	15.632
95th Percentile (mi)[(a)]	0.872	3.703	8.380	12.860	15.261	17.802
Number of Segments With Width	17448	16064	9145	2903	1005	130
Median (ft)	80.6	147.2	241.4	471.9	763.9	958.5
Average (ft)	119.9	241.3	442.4	872.6	1426.8	1581.0
5th Percentile (ft)[(a)]	112.5	218.8	404.5	879.0	1513.2	1617.0
Expected Value (ft)[(b)]	113.8	221.8	413.5	920.0	1648.5	2047.8
95th Percentile (ft)[(a)]	115.2	225.0	422.8	962.9	1795.9	2593.4
Number of Segments With Areas	14823	13425	7680	2678	956	120
Median (mi^2)	0.0053	0.0371	0.1632	0.6433	1.4078	2.4248
Average (mi^2)	0.0458	0.2220	0.7366	2.1059	3.7797	4.6410
5th Percentile (mi^2)[(a)]	0.0292	0.2777	1.0458	2.8676	4.4162	4.5452
Expected Value (mi^2)[(b)]	0.0304	0.2921	1.1137	3.1408	5.0186	6.0152
95th Percentile (mi^2)[(a)]	0.0317	0.3072	1.1860	3.4402	5.7032	7.9605

(a) Estimated limit on expected value, assuming a lognormal distribution for tornado parameters.
(b) Assuming a lognormal distribution for tornado parameters.

Table 2-3. Distribution of Tornado Segment Lengths in the Contiguous United States

	Tornado Intensity						
Length (mi)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	39747	14876	13437	7680	2678	956	120
>0.1	33206	9743	12282	7453	2652	956	120
>0.2	29602	7385	11254	7246	2643	954	120
>0.5	23265	4270	8774	6585	2568	948	120
>1.0	18264	2535	6508	5731	2439	932	119
>2.0	14058	1573	4577	4692	2226	875	115
>5.0	8779	627	2494	3080	1739	735	104
>10.0	4453	245	1026	1582	1038	489	73
>20.0	1343	63	254	475	327	190	34
>50.0	130	9	33	45	24	18	1
>100.0	10	1	3	3	2	1	0

Table 2-4. Distribution of Tornado Segment Widths in the Contiguous United States

	Tornado Intensity						
Width (ft)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	46695	17448	16064	9145	2903	1005	130
>10.0	46302	17158	15976	9131	2902	1005	130
>20.0	46123	16983	15972	9131	2902	1005	130
>50.0	41311	13279	15050	8969	2879	1004	130
>100.0	22509	4964	8340	5922	2334	844	105
>200.0	14832	1831	5136	4769	2174	817	105
>500.0	6669	407	1653	2330	1495	687	97
>1,000.0	3101	125	588	999	846	449	94
>2,000.0	1153	32	145	325	342	277	32
>5,000.0	138	3	12	36	41	43	3
>10,000.0	0	0	0	0	0	0	0

Table 2-5. Distribution of Tornado Segment Areas in the Contiguous United States

	Tornado Intensity						
Area (mi^2)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.00	39682	14823	13425	7680	2678	956	120
>0.01	25424	4989	9806	6940	2616	953	120
>0.02	21931	3512	8264	6520	2566	949	120
>0.05	17646	2090	6253	5793	2461	930	119
>0.10	13955	1215	4475	4932	2319	895	119
>0.20	10409	650	2921	3813	2068	844	113
>0.50	6229	217	1325	2266	1601	719	101
>1.00	3911	85	634	1338	1176	586	92
>2.00	2208	40	263	657	731	437	80
>5.00	789	8	50	203	271	214	43
>10.00	269	1	7	49	107	93	12
>20.00	58	0	0	11	21	24	2
>50.00	8	0	0	1	4	3	0

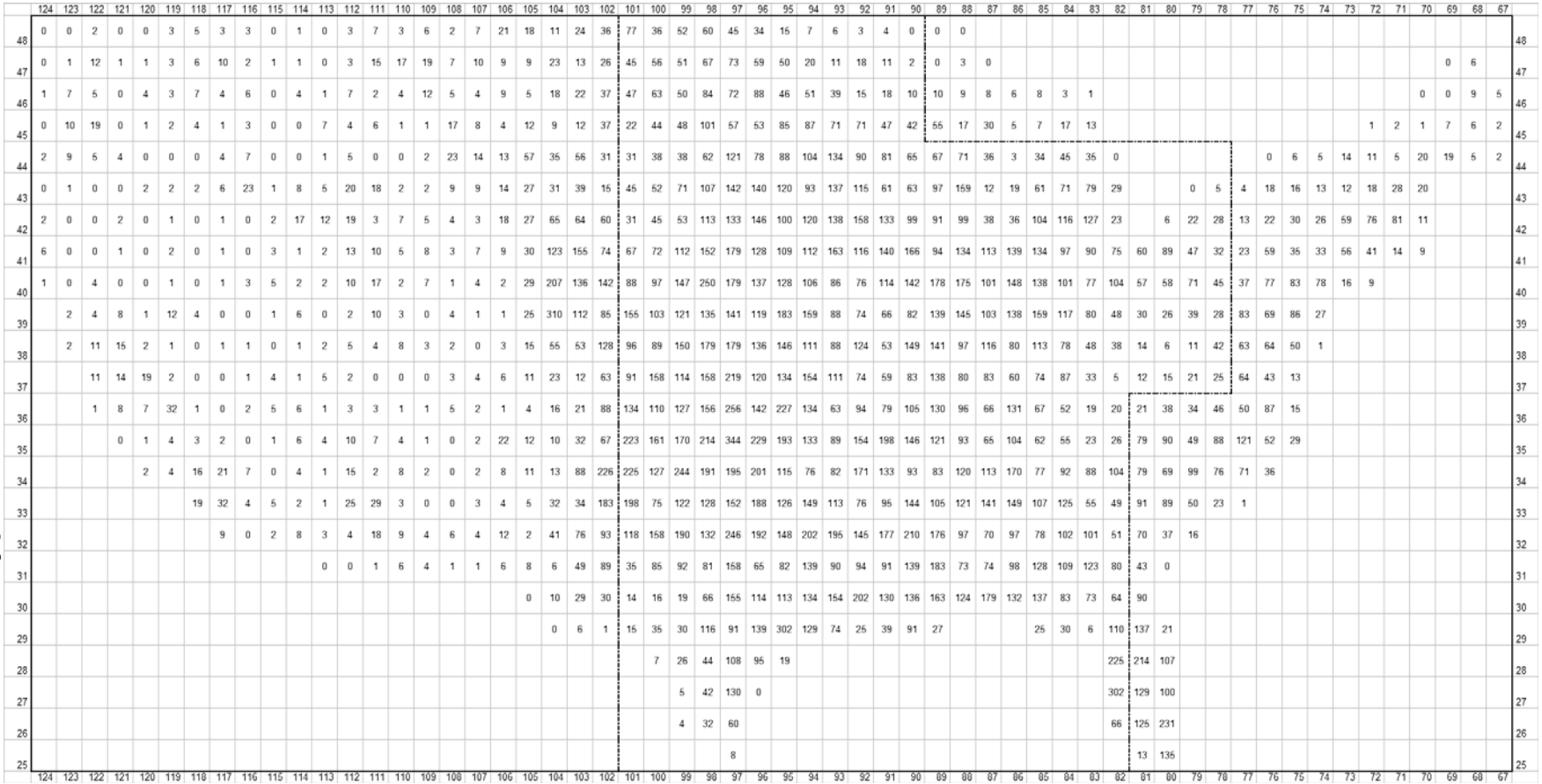

Figure 2-1. Distribution of Tornado Events in the Contiguous United States by 1° Latitude and Longitude Boxes (1950 through August 2003)

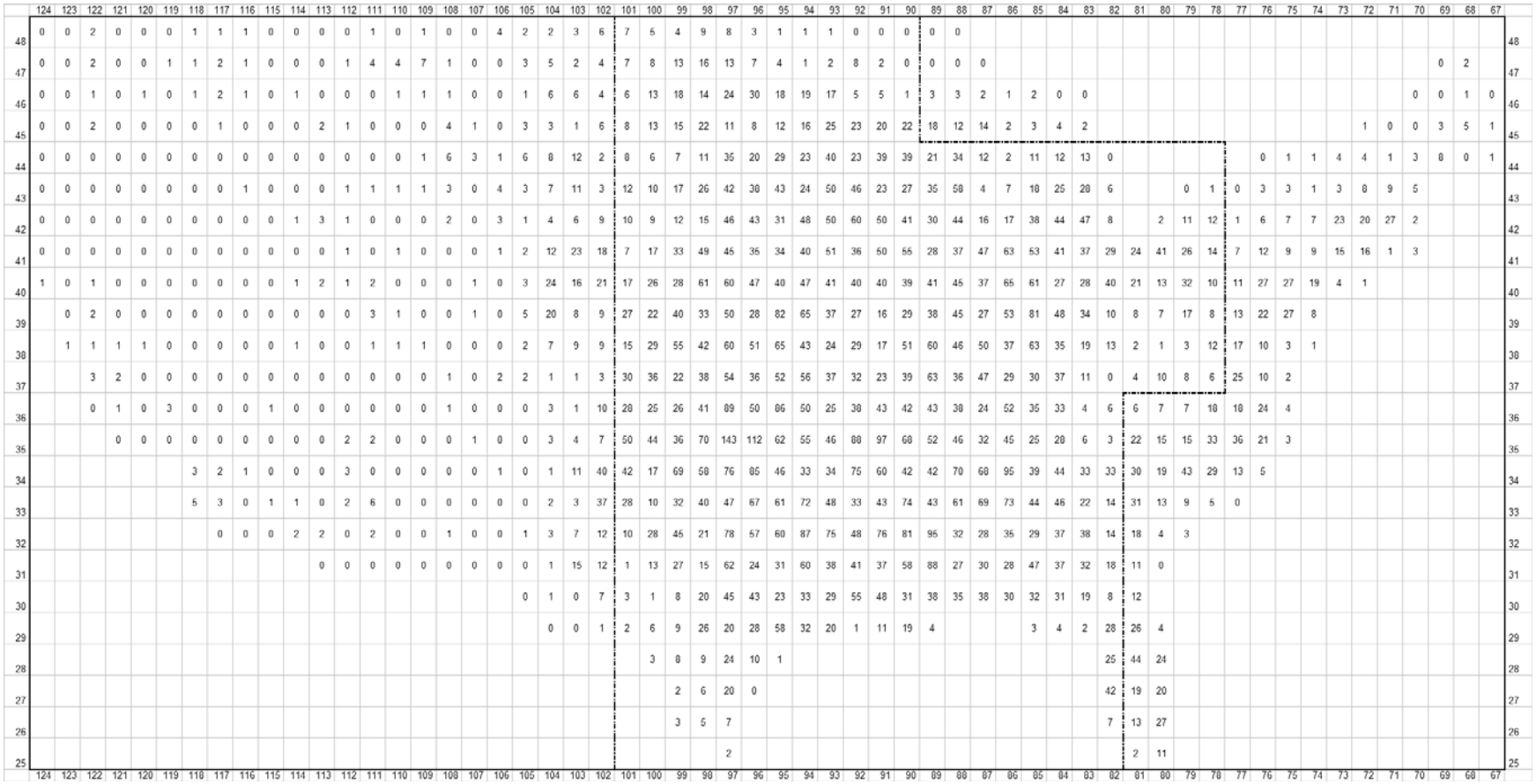

Figure 2-2. Distribution of Tornado Events with Intensities of F2 or Greater in the Contiguous United States by 1° Latitude and Longitude Boxes (1950 through August 2003)

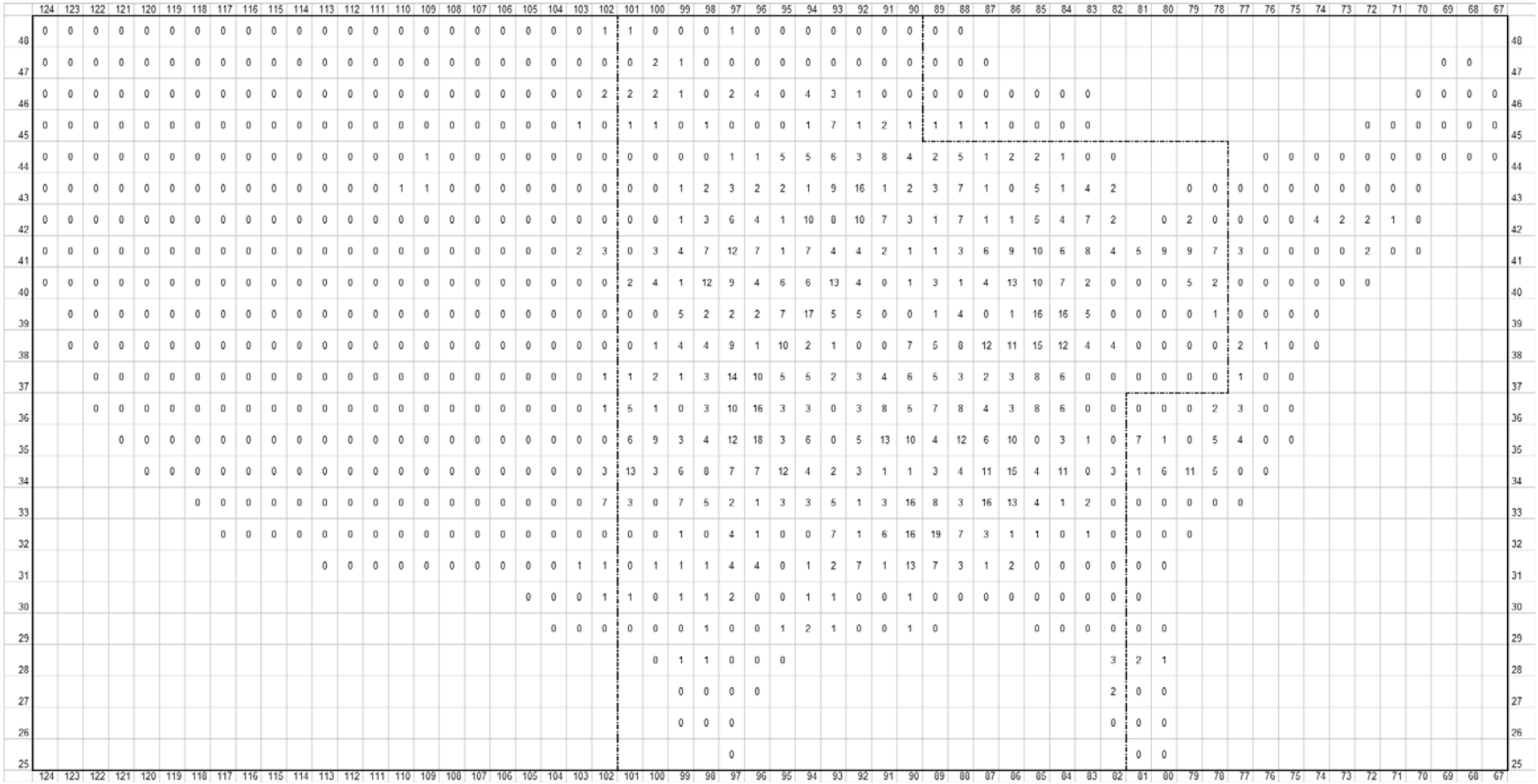

Figure 2-3. Distribution of Tornado Events with Intensities of F4 or Greater in the Contiguous United States by 1° Latitude and Longitude Boxes (1950 through August 2003)

2.3 Regional Tornado Characteristics

Previous studies have indicated that tornado characteristics vary across the country. Figures 2-1, 2-2, and 2-3 show the contiguous United States divided into three regions. The western region is the United States west of 102° west longitude. The central region covers most of the rest of the United States except for the eastern seaboard and a small area along the northern border of the United States just west of Lake Michigan. This remaining region is referred to as the eastern region. Tornado characteristics for each of the regions are listed in the tables presented in this section.

The characteristics of tornado segments in the western United States are listed in Tables 2-6 through 2-9. Tables 2-10 through 2-13 list the characteristics of tornado segments in the central United States, and Tables 2-14 through 2-17 list the characteristics of tornado segments in the eastern United States. Note that Table 2-6 lists three F5 tornado events in the western United States. These events are not included in calculations of design characteristics because there is no information on the tornado lengths.

Table 2-6. Tornado Segment Statistics for the Western United States

	Tornado Intensity					
	F0	**F1**	**F2**	**F3**	**F4**	**F5**[c]
Total Number of Segments	3004	1618	524	99	21	3
Number of Segments With Length	2451	1254	402	76	20	0
Median (mi)	0.293	0.901	2.243	2.902	13.721	0
Average (mi)	1.050	2.383	5.669	6.016	21.555	0
5th Percentile (mi)[a]	0.634	2.054	5.403	5.327	14.474	0
Expected Value (mi)[b]	0.672	2.240	6.406	7.737	23.081	0
95th Percentile (mi)[a]	0.712	2.442	7.595	11.236	36.807	0
Number of Segments With Width	2969	1615	524	99	21	3
Median (ft)	75.6	121.2	183.2	255.0	1189.9	134.6
Average	113.9	192.9	339.3	553.7	2045.0	149.0
5th Percentile (ft)[a]	104.0	165.1	271.7	388.0	1435.2	95.2
Expected Value (ft)[b]	107.1	171.8	296.1	496.7	2668.4	148.0
95th Percentile (ft)[a]	110.2	178.7	322.6	635.8	4961.3	230.1
Number of Segments With Area	2438	1251	402	76	20	0
Median (mi^2)	0.0040	0.0218	0.0918	0.1833	3.5015	0
Average	0.0460	0.1254	0.5464	0.9515	9.3826	0
5th Percentile (mi^2)[a]	0.0191	0.1070	0.5114	0.8513	5.1247	0
Expected Value (mi^2)[b]	0.0211	0.1234	0.6799	1.7643	12.6667	0
95th Percentile (mi^2)[a]	0.0233	0.1424	0.9039	3.6567	31.3085	0

(a) Estimated limit on expected value, assuming a lognormal distribution for tornado parameters.
(b) Assuming a lognormal distribution for tornado parameters.
(c) Length and width statistics for F4 tornadoes are assumed to apply to F5 tornadoes for evaluation of Weibull parameters

Table 2-7. Distribution of Tornado Segment Lengths in the Western United States

	Tornado Intensity						
Length (mi)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	4203	2451	1254	402	76	20	0
>0.1	3017	1405	1133	386	73	20	0
>0.2	2475	1000	1011	374	70	20	0
>0.5	1699	578	721	317	63	20	0
>1.0	1117	328	457	256	56	20	0
>2.0	730	196	281	188	47	18	0
>5.0	392	85	137	122	32	16	0
>10.0	197	43	62	67	12	13	0
>20.0	70	17	17	21	6	9	0
>50.0	7	0	3	3	0	1	0
>100.0	1	0	0	0	0	1	0

Table 2-8. Distribution of Tornado Segment Widths in the Western United States

	Tornado Intensity						
Width (ft)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	5231	2969	1615	524	99	21	3
>10.0	5164	2914	1604	523	99	21	3
>20.0	5136	2888	1602	523	99	21	3
>50.0	4249	2125	1489	513	98	21	3
>100.0	1810	798	670	266	57	18	1
>200.0	841	234	338	202	48	18	1
>500.0	305	58	105	96	30	16	0
>1,000.0	124	19	34	39	18	14	0
>2,000.0	52	8	12	15	5	12	0
>5,000.0	4	1	2	0	0	1	0
>10,000.0	0	0	0	0	0	0	0

Table 2-9. Distribution of Tornado Segment Areas in the Western United States

	Tornado Intensity						
Area (mi^2)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.00	4187	2438	1251	402	76	20	0
>0.01	1897	652	819	338	68	20	0
>0.02	1489	454	639	313	63	20	0
>0.05	1007	272	401	258	56	20	0
>0.10	698	160	261	206	51	20	0
>0.20	477	98	178	141	42	18	0
>0.50	214	40	55	78	24	17	0
>1.00	121	18	28	42	18	15	0
>2.00	62	10	10	20	9	13	0
>5.00	27	2	3	10	3	9	0
>10.00	9	0	0	2	2	5	0
>20.00	4	0	0	1	0	3	0
>50.00	1	0	0	0	0	1	0

Table 2-10. Tornado Segment Statistics for the Central United States

	Tornado Intensity					
	F0	**F1**	**F2**	**F3**	**F4**	**F5**
Total Number of Segments	12891	12543	7804	2616	930	127
Number of Segments With Length	10924	10497	6569	2430	882	120
Median (mi)	0.376	1.327	3.273	6.665	9.316	11.697
Average (mi)	1.173	3.613	6.864	10.636	13.325	14.945
5th Percentile (mi)[(a)]	0.883	3.804	8.101	11.731	13.460	13.726
Expected Value (mi)[(b)]	0.909	3.936	8.423	12.294	14.312	15.632
95th Percentile (mi)[(a)]	0.935	4.073	8.757	12.884	15.218	17.802
Number of Segments With Width	12825	12537	7804	2616	930	127
Median (ft)	82.9	151.5	248.9	485.3	724.8	1004.0
Average (ft)	122.1	248.6	456.1	887.4	1337	1614.9
5th Percentile (ft)[(a)]	114.9	225.7	417.8	894.3	1411	1649.2
Expected Value (ft)[(b)]	116.5	229.3	428.0	937.8	1540.4	2079.8
95th Percentile (ft)[(a)]	118.1	233.0	438.4	983.5	1681.7	2622.8
Number of Segments With Area	10887	10491	6569	2430	882	120
Median (mi^2)	0.0057	0.0409	0.1784	0.6759	1.3268	2.4248
Average (mi^2)	0.0474	0.2412	0.7751	2.1725	3.5260	4.6410
5th Percentile (mi^2)[(a)]	0.0325	0.3183	1.1020	2.8137	4.1374	4.5452
Expected Value (mi^2)[(b)]	0.0341	0.3374	1.1784	3.0857	4.7263	6.0152
95th Percentile (mi^2)[(a)]	0.0358	0.3576	1.2601	3.3841	5.3990	7.9605

(a) Estimated limit on expected value, assuming a lognormal distribution for tornado parameters.
(b) Assuming a lognormal distribution for tornado parameters.

Table 2-11. Distribution of Tornado Segment Lengths in the Central United States

	Tornado Intensity						
Length (mi)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	31422	10924	10497	6569	2430	882	120
>0.1	26703	7278	9628	6387	2408	882	120
>0.2	24071	5615	8836	6217	2403	880	120
>0.5	19312	3291	6991	5692	2344	874	120
>1.0	15496	1990	5296	5001	2231	859	119
>2.0	12188	1254	3820	4154	2038	807	115
>5.0	7771	499	2124	2760	1604	680	104
>10.0	3970	183	879	1427	956	452	73
>20.0	1185	40	217	427	298	169	34
>50.0	111	7	27	37	23	16	1
>100.0	8	0	3	3	2	0	0

Table 2-12. Distribution of Tornado Segment Widths in the Central United States

	Tornado Intensity						
Width (ft)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	36839	12825	12537	7804	2616	930	127
>10.0	36537	12599	12471	7794	2616	930	127
>20.0	36445	12507	12471	7794	2616	930	127
>50.0	33109	10013	11782	7662	2596	929	127
>100.0	18512	3736	6672	5111	2116	773	104
>200.0	12580	1417	4176	4153	1982	748	104
>500.0	5860	314	1372	2068	1380	629	97
>1,000.0	2755	96	492	890	783	400	94
>2,000.0	1006	20	114	291	313	236	32
>5,000.0	125	2	10	35	40	35	3
>10,000.0	0	0	0	0	0	0	0

Table 2-13. Distribution of Tornado Segment Areas in the Central United States

	Tornado Intensity						
Area (mi^2)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.00	31379	10887	10491	6569	2430	882	120
>0.01	21026	3857	7807	5980	2383	879	120
>0.02	18392	2763	6646	5643	2345	875	120
>0.05	15107	1650	5152	5077	2253	856	119
>0.10	12128	956	3748	4358	2125	822	119
>0.20	9167	504	2476	3408	1892	774	113
>0.50	5566	163	1139	2036	1474	653	101
>1.00	3522	60	551	1210	1080	529	92
>2.00	2001	28	228	598	677	390	80
>5.00	717	5	42	184	256	187	43
>10.00	249	1	7	45	103	81	12
>20.00	52	0	0	10	21	19	2
>50.00	6	0	0	1	4	1	0

Table 2-14. Tornado Segment Statistics for the Eastern United States

	Tornado Intensity					
	F0	**F1**	**F2**	**F3**	**F4**	**F5**
Total Number of Segments	1659	1915	817	188	54	0
Number of Segments With Length	1501	1686	709	172	54	0
Median (mi)	0.354	1.054	2.179	6.100	8.782	0
Average (mi)	1.051	2.636	5.033	10.488	12.341	0
5th Percentile (mi)[a]	0.692	2.517	5.012	10.443	10.172	0
Expected Value (mi)[b]	0.741	2.719	5.647	12.771	12.774	0
95th Percentile (mi)[a]	0.793	2.936	6.361	15.619	16.042	0
Number of Segments With Width	1654	1912	817	188	54	0
Median (ft)	73.1	143.5	215.0	440.9	1590.6	0
Average (ft)	113.4	234.2	376.8	834.8	2733.7	0
5th Percentile (ft)[a]	100.8	208.7	331.4	728.6	2243.0	0
Expected Value (ft)[b]	104.9	217.4	355.8	874.4	3156.1	0
95th Percentile (ft)[a]	109.2	226.5	381.9	1049.3	4440.8	0
Number of Segments With Area	1498	1683	709	172	54	0
Median (mi^2)	0.0048	0.0300	0.0990	0.5573	2.6456	0.0000
Average (mi^2)	0.0334	0.1745	0.4884	1.6746	5.8469	0
5th Percentile (mi^2)[a]	0.0194	0.1690	0.5499	2.3732	4.2825	0
Expected Value (mi^2)[b]	0.0219	0.1926	0.6764	3.5746	6.4821	0
95th Percentile (mi^2)[a]	0.0246	0.2196	0.8320	5.3842	9.8116	0

(a) Estimated limit on expected value, assuming a lognormal distribution for tornado parameters.
(b) Assuming a lognormal distribution for tornado parameters.

Table 2-15. Distribution of Tornado Segment Lengths in the Eastern United States

	Tornado Intensity						
Length (mi)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	4122	1501	1686	709	172	54	0
>0.1	3486	1060	1521	680	171	54	0
>0.2	3056	770	1407	655	170	54	0
>0.5	2254	401	1062	576	161	54	0
>1.0	1651	217	755	474	152	53	0
>2.0	1140	123	476	350	141	50	0
>5.0	616	43	233	198	103	39	0
>10.0	286	19	85	88	70	24	0
>20.0	88	6	20	27	23	12	0
>50.0	12	2	3	5	1	1	0
>100.0	1	1	0	0	0	0	0

Table 2-16. Distribution of Tornado Segment Widths in the Eastern United States

	Tornado Intensity						
Width (ft)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.0	4625	1654	1912	817	188	54	0
>10.0	4601	1645	1901	814	187	54	0
>20.0	4542	1588	1899	814	187	54	0
>50.0	3953	1141	1779	794	185	54	0
>100.0	2187	430	998	545	161	53	0
>200.0	1411	180	622	414	144	51	0
>500.0	504	35	176	166	85	42	0
>1,000.0	222	10	62	70	45	35	0
>2,000.0	95	4	19	19	24	29	0
>5,000.0	9	0	0	1	1	7	0
>10,000.0	0	0	0	0	0	0	0

Table 2-17. Distribution of Tornado Segment Areas in the Eastern United States

	Tornado Intensity						
Area (mi^2)	**All**	**F0**	**F1**	**F2**	**F3**	**F4**	**F5**
>0.00	4116	1498	1683	709	172	54	0
>0.01	2501	480	1180	622	165	54	0
>0.02	2050	295	979	564	158	54	0
>0.05	1532	168	700	458	152	54	0
>0.10	1129	99	466	368	143	53	0
>0.20	765	48	267	264	134	52	0
>0.50	449	14	131	152	103	49	0
>1.00	268	7	55	86	78	42	0
>2.00	145	2	25	39	45	34	0
>5.00	45	1	5	9	12	18	0
>10.00	11	0	0	2	2	7	0
>20.00	2	0	0	0	0	2	0
>50.00	1	0	0	0	0	1	0

3.0 Adjustments to the Tornado Data

In the analysis in NUREG/CR-4461, tornado data were used as reported. No attempt was made to adjust or correct the data for potential errors in the subjective evaluation of characteristics of a specific tornado. However, there are two areas where potential adjustments to the data were considered. The first area is under-reporting of tornadoes, particularly the weaker tornadoes. The second area is the assumption that the tornado intensity is uniform over the entire area impacted by the tornado. Section 3.1 discusses the under-reported tornadoes, and Section 3.2 discusses the variation of tornado intensity within the footprint.

3.1 Unreported Tornadoes

Fujita (1978) discusses the history of tornado reports from 1912 through 1977. There was a gradual increase in the number of tornadoes reported annually until the early post-World War II era, when there was a large increase in the number of tornadoes reported. The increase in reported tornadoes has been attributed to increased efficiency in data collection and increased population density. Analysis of Fujita's data in the initial version of NUREG/CR-4461 (Ramsdell and Andrews 1986) indicated that most of the increase in the total number of tornadoes was due to increases in F0, F1, and F2 tornadoes. Any increase in the number of F3 through F5 tornadoes was statistically insignificant. Figure 3-1 shows that the trend in number of tornadoes each year has continued. However, statistical analysis of the number of tornadoes since January 1950 discloses that the only tornadoes with a statistically significant trend are the F0 tornadoes. Figure 3-2 shows the number of F0 tornadoes each year since January 1950 and the total number of more intense tornadoes. This figure shows that in 1950 there were almost no F0 tornadoes

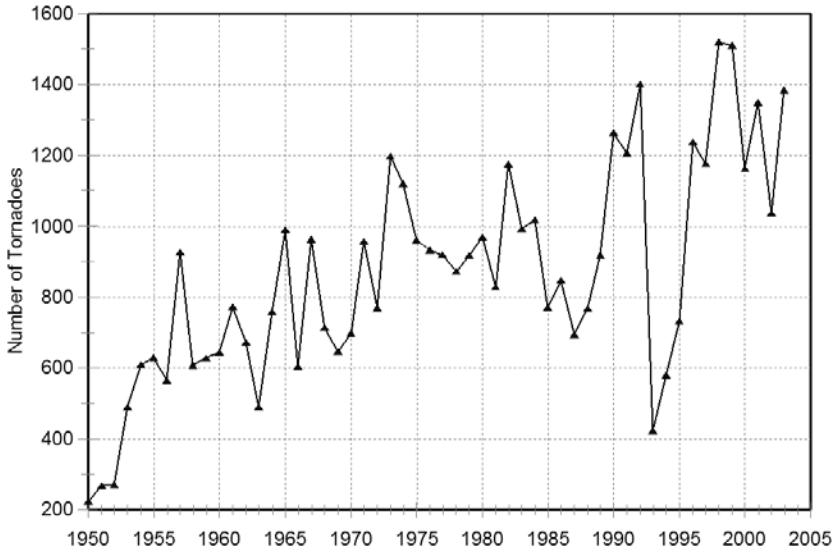

Figure 3-1. Annual Number of Reported Tornadoes (1950 through August 2003)

reported and that there has been a steady increase since then. In contrast, the figure shows that the number of F1 through F5 tornadoes, while highly variable, does not have an upward trend.

The potential impact of the F0 tornado trend has been evaluated by assuming that the trend is in the reporting of F0 tornadoes, not in the number of occurrences of F0 tornadoes, and that the average number of tornadoes per year over the last 8 years is representative of the true average for the full 53+ year period. Given these assumptions, there should have been about 43,400 F0 tornadoes during this period. Yet, there were only about 17,500 F0 tornadoes reported. The area impacted by the 17,500 reported F0 tornadoes is about 534 mi^2. Had all 43,600 F0 tornadoes been reported, it is estimated that the impacted area would increase to about 1,320 mi^2. This is an increase of about a factor of 2.5, which is significant. However, the increase in total area impacted by all tornadoes by accounting for unreported F0 tornadoes is much smaller. The total area would increase from about 30,400 mi^2 to 31,100 mi^2, an increase of less than 2.5 percent. Figure 3-3 shows that the addition of the missing F0 tornadoes has little impact on tornado strike probability for the more likely events and decreases the probability for low probability events. As a result, no adjustment was made to the data to account for unreported F0 tornadoes.

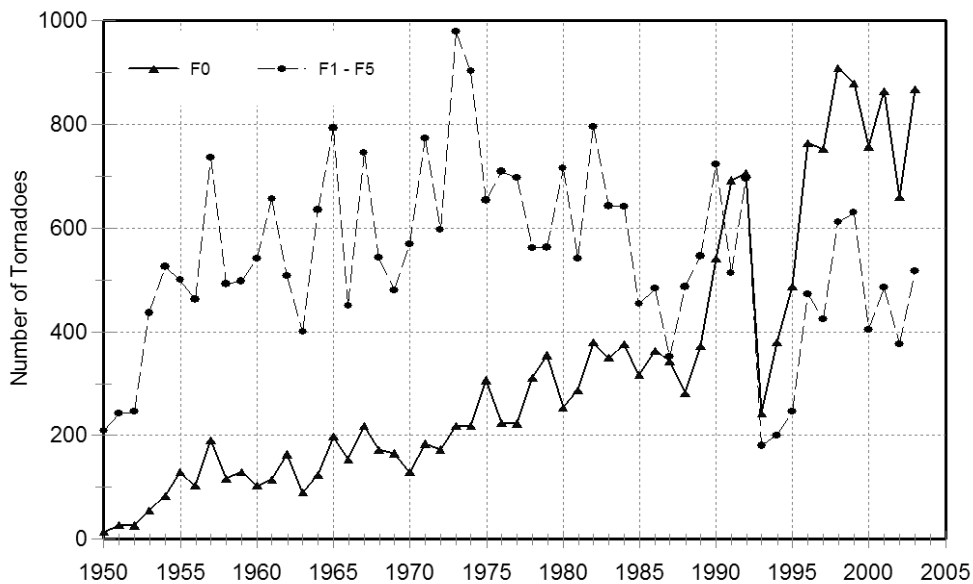

Figure 3-2. Number of F0 Tornadoes and Total Number of F1 through F5 Tornadoes by Year Since 1950

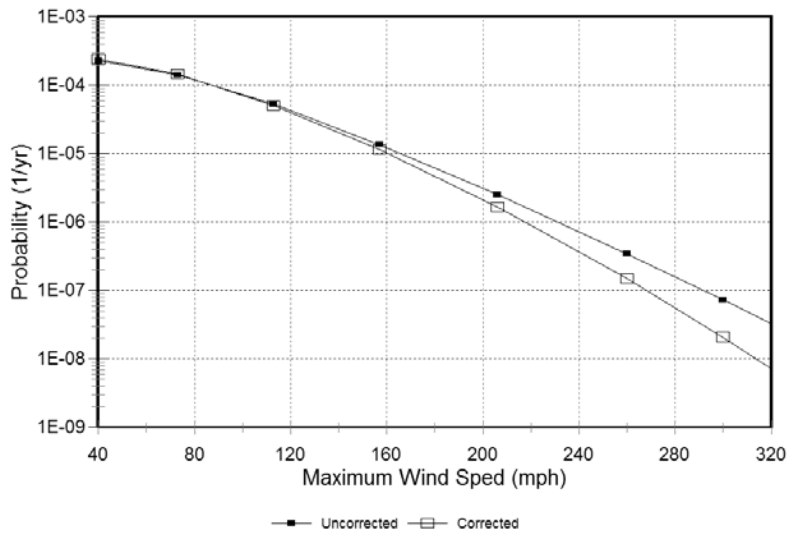

Figure 3-3. Wind Speed Probability With and Without Correction for Unreported F0 Tornadoes

3.2 Variation of Wind Speed Within the Impact Area

The analysis in the initial version of NUREG/CR-4461 (Ramsdell and Andrews 1986) assumed that intensity reported for each tornado represented the wind speed experienced by the entire area within the ground footprint of the tornado. This conservative assumption was consistent with assumptions made in previous analyses (Markee et al. 1974; Shreck and Sandusky 1982). Theoretical considerations and empirical evidence in tornado tracks indicate that the assumption is incorrect and that only a small fraction of the area of the footprint is impacted by the maximum wind speed in the tornado. Note that all segments of a tornado have the same intensity and the analyses presented in this report are based on total area and length. Therefore, segmentation of the tornadoes in the database does not affect either the adjustment or the results of the analysis.

Reinhold and Ellingwood (1982) present the results of several studies that have estimated the variation of maximum wind speeds along and across tornado paths. In addition, they have combined these results to estimate fractions of the impacted area associated with each wind speed class. Reinhold and Ellingwood (1982), Table 15d, lists the areal distribution of wind speeds used in the analysis in NUREG/CR-4461, Rev. 1, to estimate the area associated with wind speed ranges from the areas associated with reported F Scales. This table was based, in part, on a tornado model that used the wind speeds associated with the original Fujita Scale. As a result, the adjustments to the table were required to account for the wind speeds associated with the Enhanced Fujita Scale.

Specifically, Table 3-1 in NUREG/CR-4461, Rev. 1, was based on the product of two matrices, one that described the variation of wind speed across the tornado path, and another that described the variation of wind speed along the tornado path. The matrix that described the variation of wind speed across the tornado path was based on a tornado model the was linked to the Fujita Scale wind speeds. This matrix was replaced by a matrix developed by combining estimates from a conservative tornado model and data

from empirical evaluation of tornado damage. The tornado model was a stationary Rankine vortex with Enhanced Fujita Scale wind speeds, and the empirical data were from Table 7c of Reinhold and Ellingwood (1982). The probability estimates were combined as a weighted average with the data from Table 7c having a weight of 2/3 and the estimates from the Rankine model having a weight of 1/3. The results of this process were then combined with the information of variation of wind speed along the tornado path in Reinhold and Ellingwood, Table 6c, to estimate the fraction of the area associated with each Enhanced Fujita Scale wind speed class given the Fujita F Scale for the tornado. Table 3-1 presents these fractions. As before, the conversion of total impact areas by F Scale to areas associated with wind-speed classes is performed on tornado statistics rather than on individual tornadoes.

Table 3-1. Tornado Area Intensity Distribution for the Point Structure Design Wind Speed Estimates

Intensity F Scale	Wind-Speed Range (mph)	Recorded Tornado F Scale					
		F0	**F1**	**F2**	**F3**	**F4**	**F5**
EF0	65 - 85	1	0.772	0.616	0.529	0.543	0.538
EF1	86 - 110		0.228	0.268	0.271	0.238	0.223
EF2	111 - 135			0.115	0.133	0.131	0.119
EF3	136 - 165				0.067	0.056	0.07
EF4	165 - 200					0.032	0.033
EF5	>200						0.017

The interpretation of Table 3-1 is as follows: 100 percent of the area impacted by F0 tornadoes has a wind speed in the 65 to 85 mph range. For F1 tornadoes, 22.8 percent of the area has wind speeds in the 86 to 110 mph range, and 77.2 percent of the area has wind speeds in the 65 to 85 mph range. Similarly, 11.5 percent of the area impacted by F2 tornadoes has wind speeds in the 111 to 135 mph wind speed range, 26.8 percent has wind speeds in the 86 to 110 mph range, and the remaining 61.6 percent of the area has wind speeds in the 65 to 85 mph range.

Adjustment of areas based on tornado event dimensions to areas associated with intensity (wind speed) is illustrated in Table 3-2. The first column in the table lists the reported F Scale, and the last column lists the range of maximum wind speeds associated with the EF Scale. The total area impacted for tornadoes in each category is listed in the second column. The third column lists the area by wind-speed classes after adjustment to account for variation in wind speed within the impact area. For example, the total area impacted by winds from 65 through 85 mph is all of the area of F0 tornadoes, plus 77.2 percent of the area impacted by F1 tornadoes, plus 61.6 percent of the area impacted by F2 tornadoes, etc. Note that the areas in column 3 decrease monotonically with increasing wind speed, while the areas in column 2 do not. Note also that the total impact area for all tornadoes before and after the adjustment remains constant within limits of roundoff error; the adjustment does not affect the strike probability. The fourth column lists cumulative area based on wind speed. The F0 entry lists the total area for tornadoes of all classes. This is

the area to be used in calculating the strike probability. The F1 entry lists the total area with wind speeds of 86 mph or greater. In this analysis, impacted areas used in calculation of strike probabilities and design characteristics have been adjusted for the variation in speed along and across tornado paths.

The analysis in the initial version of NUREG-4461 (Ramsdell and Andrews 1986) estimated only tornado strike probabilities and design wind speeds for point structures. That analysis was based entirely on the tornado impact areas. The impact area adjustment just described is appropriate for estimating strike probabilities and design speeds for point structures. This report considers both point structures and finite structures.

Table 3-2. Area Impacted by Tornadoes in the Contiguous United States

F Scale	Total Area (mi^2) by F Scale	Total Area (mi^2) by Wind-Speed Range	Cumulative Area (mi^2)	Probability of Wind Speed Exceeding Threshold	Enhanced Fujita Scale Wind-Speed Range (mph)
F0	533.6	18420.6	30357.6	1.00×10^{0}	65 - 85
F1	4695.8	7652.0	11937.0	3.43×10^{-1}	86 - 111
F2	10184.8	3136.0	4285.0	1.41×10^{-1}	111 - 135
F3	9117.7	947.6	1149.0	3.78×10^{-2}	136 - 165
F4	5043.7	187.8	201.4	6.63×10^{-3}	166 - 200
F5	782	13.6	13.6	4.48×10^{-4}	>200

Estimation of strike probabilities and design speeds for finite structures involves both tornado impact areas and tornado lengths. Consequently, it is necessary to estimate the total length of tornado paths associated with wind speeds. Table 3-3 presents estimates of the distribution of wind speeds by length for each F Scale made by Twisdale and Dunn (1981). These estimates are used in the same way as the information in Table 3-1.

Tornado lengths used in the estimates of strike probability and design characteristics for finite-structures in this report have been adjusted to account for the variation of wind speed along tornado paths. This adjustment does not change the total path length for all tornadoes.

Note that all segments of a tornado have the same intensity, and the analyses presented in this report are based on total area and length. Therefore, segmentation of the tornadoes in the database does not affect either of the adjustments or the results of the analyses.

Table 3-3. Tornado Length Intensity Distribution for the Finite-Structure Design Wind Speed Estimates

Intensity F Scale	Wind-Speed Range (mph)	Recorded Tornado F Scale					
		F0	**F1**	**F2**	**F3**	**F4**	**F5**
EF0	65 - 85	1	0.572	0.28	0.116	0.142	0.133
EF1	86 - 110		0.428	0.352	0.245	0.158	0.102
EF2	111 - 135			0.368	0.318	0.278	0.189
EF3	136 - 165				0.321	0.21	0.242
EF4	166 - 200					0.212	0.185
EF5	>260						0.149

4.0 Tornado Model

The general approach used to evaluate tornado strike probabilities and design wind speeds in NUREG/CR-4461, Rev. 1, and in this revision follows the approach taken in the initial version of NUREG/CR-4461. However, two significant modifications have been made to that approach. The first modification is addition of a second term to the estimation of strike probabilities. In the initial version of NUREG/CR-4461, strike probabilities were estimated using a point strike calculation in which the structure dimensions were assumed to be negligible relative to tornado dimensions. The current analysis includes a "life line" term to account for finite building dimensions (Garson et al. 1975). The second modification to the approach used in the initial version of NUREG/CR-4461 is to account for the variation of tornado intensity along and across the tornado path. The previous analysis assumed that the entire tornado footprint experienced wind speeds equaling or exceeding the minimum wind speed for the reported tornado intensity (Fujita F Scale). Section 3.2 describes the change in basis for area and length from the F Scale to wind speed. The calculations described in the following sections assume that areas and lengths associated with wind-speed ranges are used. Thus, they account for the variation of wind speed along and across the path.

The specification of a design basis wind speed has two parts: specification of an exceedence probability and specification of the appropriate wind speed for the exceedence probability. The approach followed in the past (Markee et al. 1974; AEC 1974; Shreck and Sandusky 1982; Ramsdell and Andrews 1986) has been to define the exceedence probability, to estimate the probability of a tornado striking a site, and to determine the conditional probability of exceeding specified wind speeds, assuming that a tornado strike occurs. The design exceedence probability and the strike probability are used to establish a conditional probability, which is converted to the design wind speed. This same general procedure is used in this analysis.

4.1 Point Structures

Consider, first, the point structure probability, P_p. The probability of the wind speed, u, exceeding some value u_o at a site is defined as the product of the probability that a tornado will strike the point structure and the conditional probability that the wind speed u will exceed u_o, assuming that a tornado strike, s, occurs:

$$P_p(u \geq u_o) = P_p \times P_p(u \geq u_o | s) \tag{4-1}$$

The strike probability can now be defined without regard to the tornado intensity:

$$P_p = \frac{A_t}{NA_r} \tag{4-2}$$

where A_t is the total area (mi^2) impacted by tornadoes in the region of interest, which has an area denoted by A_r (mi^2), and N is the number of years of record. For example, A_r, the area of the contiguous United States, is about 3,020,000 mi^2, and the N is 53.67 years. The total tornado area is the product of the expected area for tornado events and the total number of tornado events that impacted the region of interest in N years (~30,358 mi^2). Using these values, the expected strike probability is about 1.87×10^{-4} yr^{-1}. The same calculations can be made using the upper and lower limits of the 90 percent confidence interval for the expected area. The results of the calculations show that the limits are 1.72×10^{-4} yr^{-1} and 2.04×10^{-4} yr^{-1}, respectively. The number of events in these calculations include events that were not considered in the calculation of the expected values for the area because of missing information.

Equation (4-1) shows the probability of exceeding a given wind speed at a point as the product of two components. The first component is the probability of a tornado striking a point, and the second component is a conditional probability of exceeding a given wind speed assuming that a tornado strike occurs, $P_p(u \geq u_o|s)$. As indicated above, the strike probability can be estimated from the total area impacted by tornadoes without regard to F Scale. The conditional probability of exceeding u_o given that a tornado has occurred is estimated as

$$P_p(u \geq u_o|s) = \frac{A_{u \geq u_o}}{A_t} \tag{4-3}$$

where $A_{u \geq uo}$ is the total area impacted by wind speeds greater than u_o. The next-to-last column in Table 3-2 lists the results of applying Equation (4-3) to the areas in column 4 of Table 3-2. These values, with the lower bound wind speed in each range in the last column, provide up to six points on a curve that can be used to represent the conditional probability.

The probability of exceeding u_o may be represented by a Weibull distribution. In that distribution,

$$P_p(u \geq u_o|s) = \mathrm{Exp}\left[-\left(\frac{u_o - 65}{a_p}\right)^{b_p}\right] \tag{4-4}$$

where 65 is the minimum tornado wind speed, and a and b are parameters of the Weibull distribution. Estimation of these parameters requires good estimates of $A_{u \geq uo}$ which can only be obtained from considering a large number of tornadoes. An optimization procedure, for example, the Nelder-Mead Simplex algorithm (Nelder and Mead 1965), may be used to determine the parameter values that minimize the sum of squares of the errors between the probabilities estimated using the Weibull distribution and the observed probabilities.

The optimization algorithm requires impacted areas for at least three F Scales. Many areas of the west and some areas of the east do not have a reported F2 or stronger tornado. In addition, the confidence interval for the expected area and length of tornadoes increases rapidly as the number of tornadoes decreases. Therefore, the contiguous United States has been divided into three regions for the purpose of determining the conditional probability to ensure that there are sufficient tornadoes to adequately define the frequency of low probability events. Figures 2-1, 2-2, and 2-3 show the regions. The dividing line between the western and central regions was moved 3° east from the dividing line between the western and eastern United States in the initial version of NUREG/CR-4461 after considering the number of F2 or greater tornadoes (Figures 2-2 and 2-3). The dividing line between the central and eastern United State was based on the number of F4 tornadoes (Figure 2-3).

4.2 Large Structures

Consider now the probability represented by the life-line term. If a structure is large, the probability of being struck by a tornado is greater than that based only on tornado dimensions. The additional probability is determined by a characteristic dimension of the structure and the expected length for tornadoes. This additional probability is estimated by the life-line term.

The process for estimating the life-line term is nearly identical to the process for estimating the point-structure term. The initial step is to separate the desired probability into a strike probability that is independent of intensity and a conditional probability that considers intensity:

$$P_l(u \geq u_o) = P_l \times P(u \geq u_o|s) \tag{4-5}$$

The initial definition of the strike probability is also the same:

$$P_l = \frac{A_t}{NA_r} = \frac{w_s L_t}{NA_r} \tag{4-6}$$

However, in this case, the impacted area is estimated as the product of a characteristic building dimension, w_s, (mi), and the total length of tornado paths, L_t (mi). A characteristic dimension of 200 ft (0.0379 mi) has been assumed for this analysis. With this change, the conditional probability statement becomes:

$$P_l(u \geq u_o|s) = \frac{L_{u \geq u_o}}{L_t} \tag{4-7}$$

where $L_{u \geq u_o}$ is the total tornado path length with wind speeds equaling or exceeding u_o.

Continuing the analogy with the point-structure term, the conditional probability may be represented by a Weibull distribution, and the parameters of the distribution may be estimated using an optimization procedure:

$$P_l(u \geq u_o|s) = \mathrm{Exp}\left[-\left(\frac{u_o - 65}{a_l}\right)^{b_l}\right] \tag{4-8}$$

4.3 Total Strike Probability and Design Wind Speed

The total probability of a structure being struck by a tornado with winds exceeding some value u is the sum of the point structure and life-line probabilities:

$$\begin{aligned} P(u \geq u_o) &= P_p(u \geq u_o) + P_l(u \geq u_o) \\ &= \frac{A_t}{NA_r}\mathrm{Exp}\left[-\left(\frac{u_o - 65}{a_p}\right)^{b_p}\right] + \frac{w_s L_t}{NA_r}\mathrm{Exp}\left[-\left(\frac{u_o - 65}{a_l}\right)^{b_l}\right] \end{aligned} \tag{4-9}$$

Equation (4-9) provides the means to estimate the probability of a tornado strike with wind speeds exceeding u_o, but it cannot be inverted to estimate the wind speed, u_o, associated with a given probability. Estimation of the wind speed associated with a given probability involves two steps. In the first step, strike probabilities are estimated for a range of wind speeds that is sufficiently large that the strike probability of interest is included within the range of calculated strike probabilities. Then, in the second step, the wind speed of interest, u_o, associated with the given probability is determined by interpolation.

5.0 Analytical Results

Two computer programs were written to analyze NCDC tornado data. One of the programs, TorBoxes, was used to calculate the descriptive tornado statistics presented in Chapter 2.0 and tornado statistics for 1°, 2°, and 4° boxes. The other program, TorStrk, was written to calculate tornado statistics for specific locations.

The results of manual analysis of the descriptive tornado statistics are presented in Section 5.1. These results include estimates of the strike probabilities and Weibull parameter values for the contiguous United States and the three regions of the United States shown in Figures 2-1, 2-2, and 2-3. Design statistics for the 1°, 2°, and 4° boxes based on local strike probabilities and conditional wind speed probabilities calculated using the appropriate regional Weibull parameter values are presented in Section 5.2.

5.1 Contiguous United States and Regions

Chapter 2.0 presents descriptive statistics for tornadoes in the contiguous United States and for the western, central, and eastern regions. These statistics have been used to estimate strike probabilities for the contiguous United States and each of the regions. They have also been used to estimate parameter values, a and b, for the Weibull distributions that are assumed to describe the conditional probability of the wind exceeding a specified speed if a tornado does strike. Table 5-1 contains the results of these calculations. Probabilities of exceeding specified wind speeds in the contiguous United States and the three regions are compared in Figure 5-1.

Table 5-1. Calculated Tornado Model Parameters

		Point Structure			**Finite Structure**		
	Region	**Strike Probability**	**a**	**b**	**Strike Probability**	**a**	**b**
Expected Values	U.S.	1.87×10^{-4}	26.86	1.255	4.64×10^{-5}	40.33	1.542
	West	1.67×10^{-5}	25.62	1.188	5.94×10^{-6}	30.71	1.296
	Central	3.58×10^{-4}	26.47	1.238	8.72×10^{-5}	40.84	1.545
	East	9.55×10^{-5}	24.63	1.164	2.58×10^{-5}	36.65	1.507
5% Lower-Limit	U.S.	1.72×10^{-4}	27.05	1.276	4.47×10^{-5}	40.30	1.553
	West	1.07×10^{-5}	22.31	1.133	5.14×10^{-6}	28.05	1.253
	Central	3.28×10^{-4}	26.65	1.258	8.37×10^{-5}	40.82	1.555
	East	7.15×10^{-5}	23.66	1.149	2.30×10^{-5}	35.60	1.489
95% Upper-Limit	U.S.	2.04×10^{-4}	26.67	1.235	4.82×10^{-5}	40.37	1.532
	West	2.87×10^{-5}	28.87	1.245	6.94×10^{-6}	33.72	1.384
	Central	3.92×10^{-4}	26.29	1.218	9.09×10^{-5}	40.86	1.534
	East	1.29×10^{-4}	25.56	1.179	2.91×10^{-5}	37.73	1.527

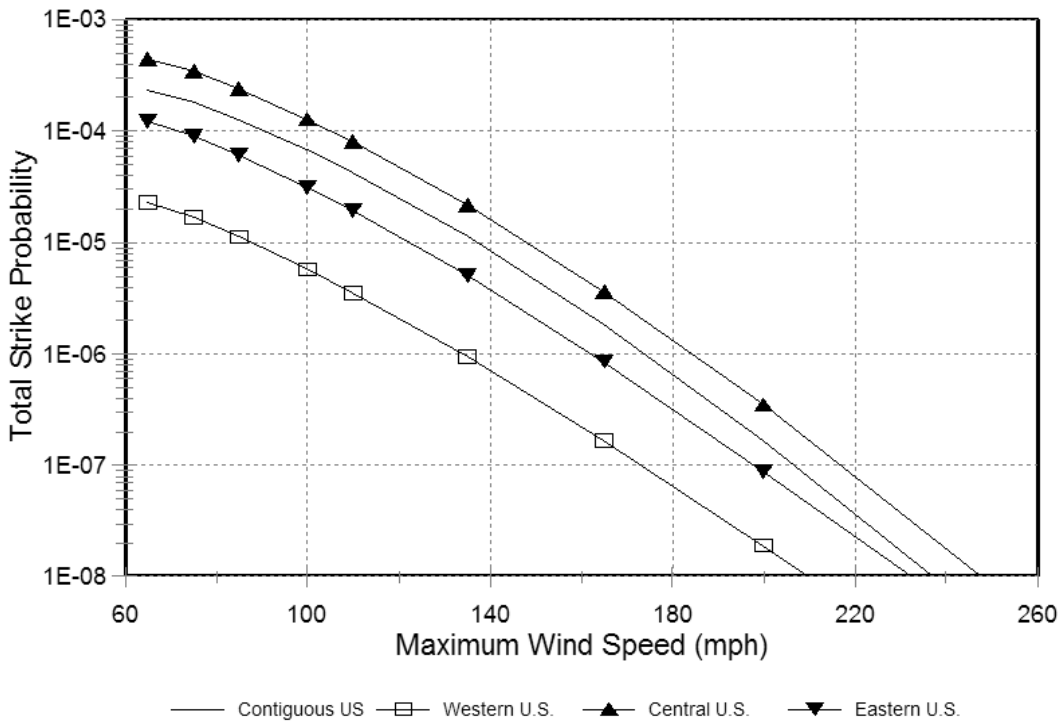

Figure 5-1. Comparison of Conditional Wind Speed Probabilities Calculated for the Contiguous United States and for the Western, Central, and Eastern Regions

Figures 5-2 and 5-3 compare the conditional probabilities associated with the point-structure and life-line terms, respectively. The curves in these figures show the effects of the differences in the Weibull parameters listed in Table 5-1. Remember that these figures do not include the probability that an event will occur. Figure 5-2 shows that there are no significant regional differences in the conditional probabilities associated with the point-structure term for the most likely events (events with greater than 1×10^{-2} probability of occurrence). For events with less than a 1×10^{-2} probability of occurrence, slightly higher wind speeds are more likely in the western region than in either the central or eastern region. Figure 5-3 shows that the regional differences in conditional probabilities associated with the life-line term are greater than those associated with the point-structure term. Even then, there is less than a factor-of-2 difference in probability of wind speeds as high as about 200 mph.

The effects of uncertainty of strike probabilities on the maximum tornado wind speed for the three regions are shown in Figures 5-4 through 5-6. The uncertainty associated with strike probability is small in the central United States where the tornado frequency is high and large in the western United States where the tornado frequency is low. The ranges of uncertainty shown in these figure are lower than the actual uncertainty ranges because they do not include uncertainties associated with the areal distribution of wind speeds within the tornado footprint or the uncertainties in estimates of the Weibull parameters.

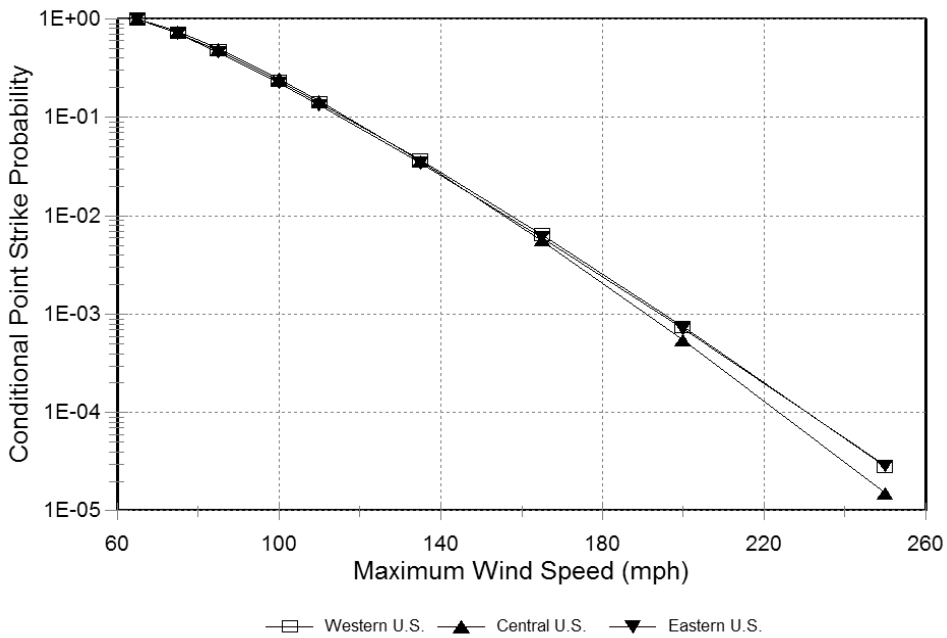

Figure 5-2. Comparison of Wind Speed Probabilities for Point Structures in the Western, Central, and Eastern Regions

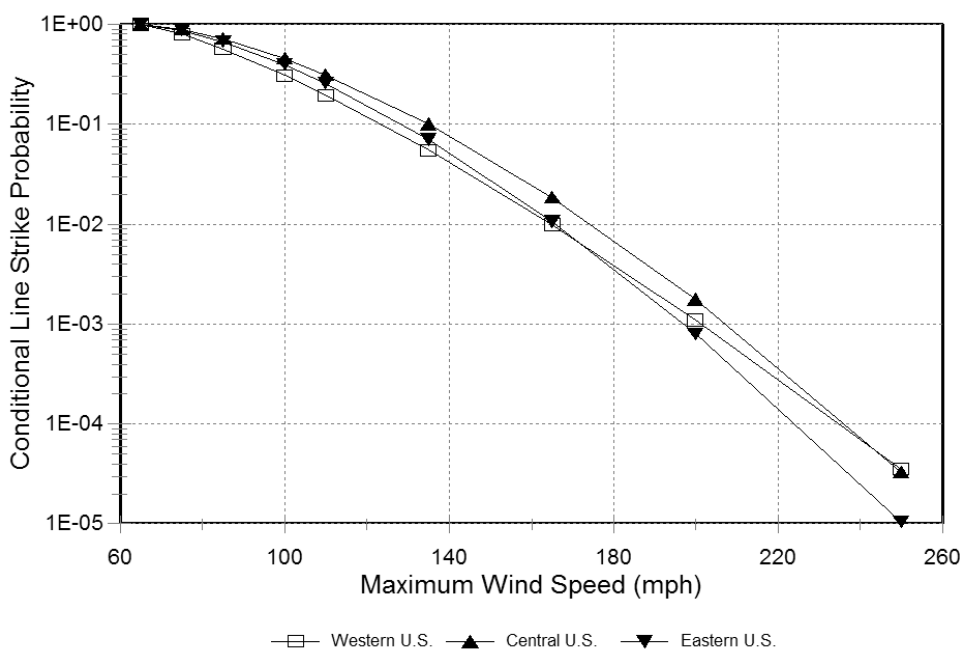

Figure 5-3. Comparison of Wind Speed Probabilities Associated with the Life-Line Term for Large Structures in the Western, Central, and Eastern Regions

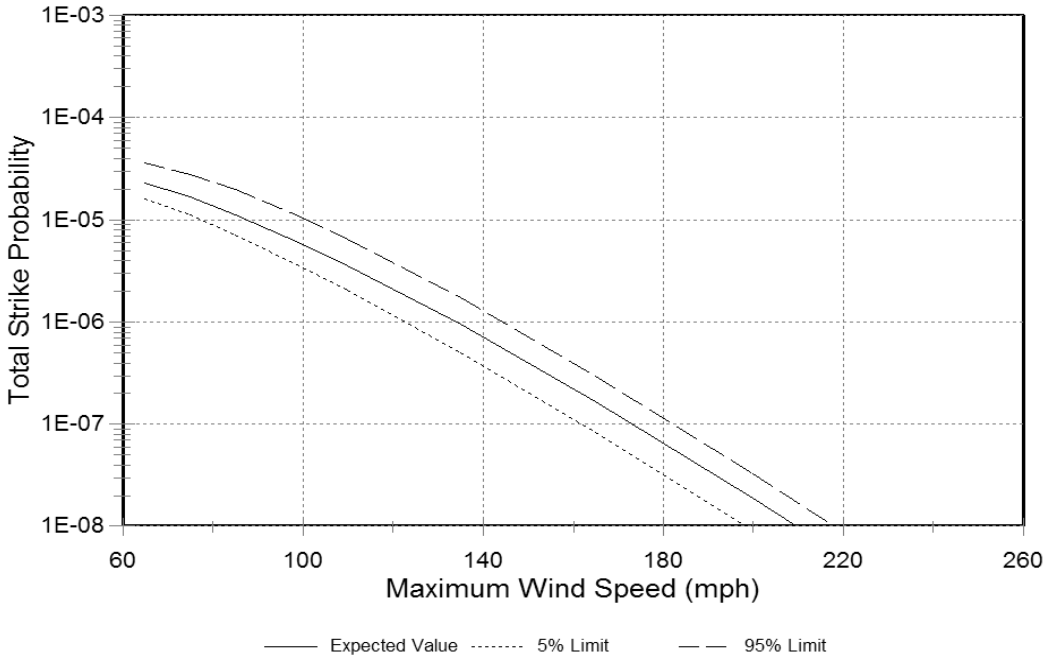

Figure 5-4. Maximum Wind Speed Probability for a 200-ft Structure in the Western United States Showing the 90 Percent Confidence Interval

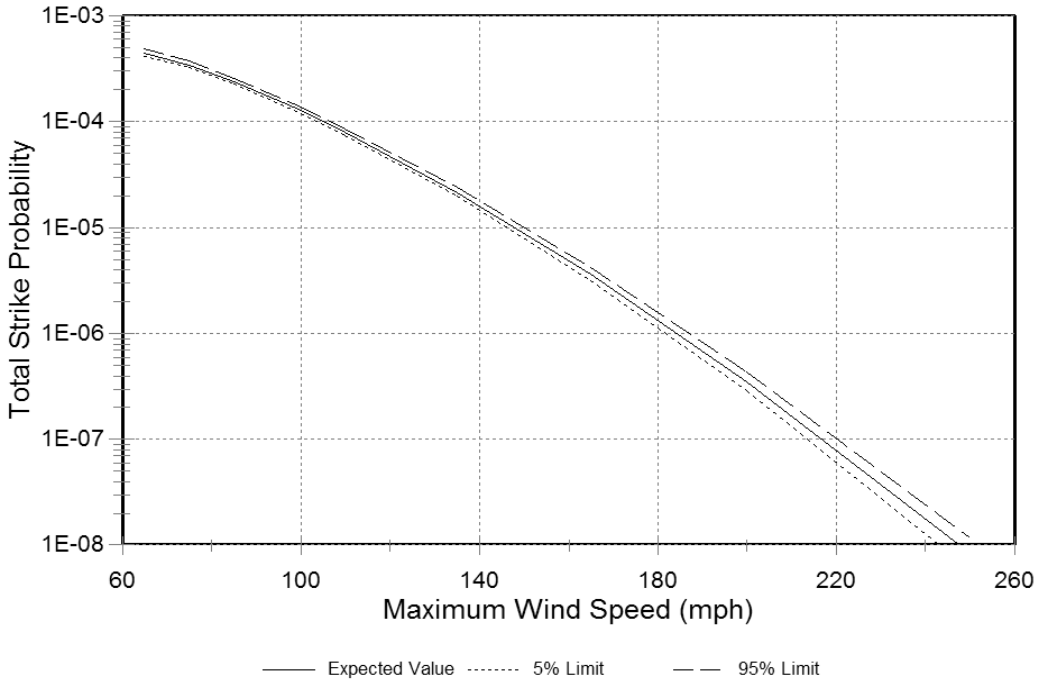

Figure 5-5. Maximum Wind Speed Probability for a 200-ft Structure in the Central United States Showing the 90 Percent Confidence Interval

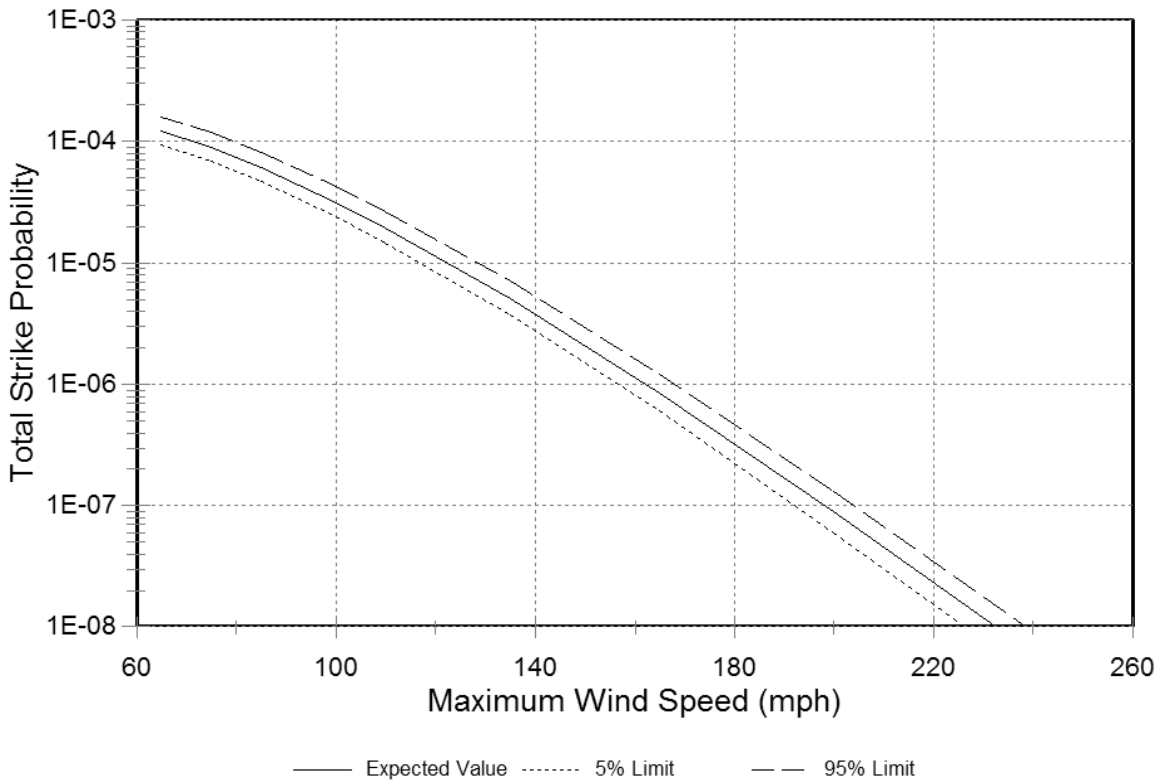

Figure 5-6. Maximum Wind Speed Probability for a 200-ft Structure in the Eastern United States Showing the 90 Percent Confidence Interval

5.2 Subregional Results

Tornado characteristics have been estimated for 1°, 2°, and 4° latitude and longitude boxes. These characteristics are listed in Appendices A, B, and C. Appendix A lists the characteristics for 2° boxes; Appendix B lists the characteristics for 4° boxes; and Appendix C lists the characteristics for 1° boxes. The characteristics for the 2° and 4° boxes are considered most reliable; those for 1° boxes should only be used if the number of events is large enough to ensure that the statistics are likely to be reliable. The appendices include the expected tornado impact area and length; the point-structure, finite-structure, and total strike probabilities; and design wind speeds at the 10^{-5}, 10^{-6}, and 10^{-7} yr^{-1} probability levels. The upper and lower limits for these characteristics are also included, as are the number of events and the land area within the box.

Figure 5-7 shows the distribution of tornadoes by 2° boxes. The design wind speeds for the 2° boxes are shown in Figures 5-8 through 5-13. Figures 5-8 and 5-9 show the expected and upper limit wind speeds, respectively, for the 10^{-5} yr^{-1} probability level. The upper limit speeds only account for uncertainty in the strike probability. They do not account for other sources of uncertainty. Figures 5-10 and 5-11 show the wind speeds for the 10^{-6} yr^{-1} probability level, and Figures 5-12 and 5-13 show the wind speeds for the 10^{-7} yr^{-1} probability level. In the figures showing design wind speeds, the number 0 indicates that there were no tornado events in the box or that the wind speed for the probability level is less than 65 mph.

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	15	2	17	18	3	6	42	33	46	60	99	207	228	210	92	36	16	3										6		47
45	1	41	5	16	14	4	19	13	35	24	44	105	174	282	268	255	193	110	87	47	33	13					1	3	22	7	45
43	2	14	6	4	37	9	31	20	35	50	149	140	162	272	473	393	455	254	385	70	208	141		5	22	37	54	72	24	2	43
41	8	0	3	3	2	23	46	25	20	37	243	346	208	407	562	427	565	518	407	320	435	305	153	122	115	119	227	113			41
39	1	10	9	16	4	14	14	32	12	8	571	472	438	642	556	561	311	384	613	480	502	300	170	175	260	266	25				39
37		24	50	3	3	6	14	12	8	13	103	255	419	579	626	526	389	334	435	330	340	119	45	98	232	64					37
35		1	16	40	4	18	18	15	7	27	41	207	617	658	942	670	388	507	425	355	226	87	221	210	303	44					35
33			2	38	64	11	42	42	2	17	61	517	620	668	721	451	431	449	406	541	385	286	320	239	108						33
31					9	10	7	34	15	23	57	303	394	490	655	557	502	592	495	327	407	348	149	16							31
29											10	66	77	226	493	664	446	387	309	308	271	251	245								29
27													7	115	331	19						518	544								27
25														38	68							67	499								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 5-7. Number of Tornado Events in the United States From 1950 through August 2003 by 2° Boxes

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	0	0	0	0	0	0	0	78	73	119	97	123	105	105	101	142	120	79										114		47
45	0	0	0	78	0	0	0	0	0	0	88	116	130	134	135	144	155	146	138	133	103	136					135	0	75	97	45
43	0	0	0	0	0	0	82	0	0	72	116	122	122	140	146	154	156	153	153	146	140	145		101	130	93	97	81	85	82	43
41	0	0	0	0	0	0	0	0	0	76	97	122	135	154	159	156	162	168	152	163	163	152	153	154	134	125	127	126			41
39	0	0	0	0	0	0	0	65	0	0	106	107	139	158	165	168	157	165	163	159	162	150	124	132	123	127	86				39
37		67	0	0	0	0	0	0	0	82	0	114	149	157	167	162	143	143	155	152	150	127	83	106	128	118					37
35		0	0	0	0	0	0	0	0	0	0	121	150	165	176	159	160	165	159	169	152	115	142	138	141	120					35
33			0	0	0	0	0	91	0	70	0	134	143	157	161	161	161	157	161	166	150	145	135	140	112						33
31					0	0	0	0	0	0	66	115	124	133	141	157	156	158	164	151	148	143	119	120							31
29											0	100	101	128	145	140	140	131	140	132	130	122	127								29
27													130	106	118	72						141	126								27
25														98	114							161	116								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 5-8. Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 2° Boxes

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	66	222	109	73	0	0	95	109	100	156	118	132	112	112	115	178	156	144										190		47
45	0	0	0	125	101	0	0	0	0	0	122	137	144	145	144	153	168	159	156	155	124	185						0	106	136	45
43	0	0	0	0	0	0	115	111	94	98	132	144	138	152	153	161	163	160	160	163	149	156		135	151	119	115	95	104	97	43
41	0	0	0	0	0	0	75	0	0	111	108	134	145	161	166	163	169	176	159	171	171	159	162	168	147	138	135	137			41
39	0	133	78	92	0	128	0	109	0	0	113	116	146	164	171	176	166	174	170	167	169	158	132	139	130	134	103				39
37		93	0	0	0	0	0	0	0	147	72	126	156	162	174	169	149	149	160	159	155	137	100	117	136	132					37
35		0	0	0	0	77	95	75	0	77	81	135	156	173	182	165	167	172	167	179	161	126	153	150	149	134					35
33			0	93	66	99	0	121	0	136	83	144	148	163	167	168	168	163	167	172	155	152	143	151	121						33
31					79	0	106	0	106	80	97	127	129	139	146	164	161	162	170	158	153	150	129	139							31
29											0	120	117	137	151	145	144	135	146	137	136	129	134								29
27													209	118	124	93						146	131								27
25														113	129							170	122								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 5-9. Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 2° Boxes

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	100	83	116	98	0	0	117	127	124	160	141	164	150	150	146	179	160	131										155		47
45	0	92	72	127	109	0	71	0	104	90	135	158	169	173	173	181	191	183	177	172	146	175				0	174	0	127	142	45
43	0	0	0	0	104	0	129	114	118	123	158	162	162	178	183	189	192	189	189	183	178	182		147	169	138	141	131	134	133	43
41	84	0	0	0	0	80	110	83	68	125	142	163	174	190	194	191	197	202	188	198	197	188	188	189	173	165	166	165			41
39	109	108	81	104	0	103	0	118	0	0	149	150	177	193	199	202	193	200	198	195	197	186	164	170	162	166	135				39
37		121	97	0	0	0	78	60	71	129	115	156	185	192	201	197	180	180	190	187	186	166	135	150	167	158					37
35		118	86	94	0	92	108	87	0	101	110	162	186	200	210	194	195	200	194	203	188	157	180	177	179	160					35
33			0	118	110	96	89	136	0	120	113	173	180	192	196	196	196	193	196	200	186	182	173	178	154						33
31					89	93	98	104	102	108	119	157	164	171	178	192	191	193	199	187	184	181	160	160							31
29											72	143	146	167	181	178	178	170	178	171	169	164	165								29
27													168	150	161	133						179	164								27
25														144	157							196	157								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 5-10. Expected Maximum Tornado Wind Speeds with a 10^{-6} yr^{-1} Probability of Occurrence by 2° Boxes

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	124	256	154	127	113	97	142	154	146	194	161	172	156	156	157	213	193	181										227		47
45	0	107	122	167	146	73	96	89	125	120	164	178	182	183	182	190	204	195	193	193	164	222						0	149	175	45
43	0	85	105	0	123	80	158	155	142	144	173	184	177	189	189	197	199	196	196	199	186	193		174	188	160	156	141	148	143	43
41	103	0	122	0	0	104	128	103	91	155	153	175	183	197	201	199	204	211	195	206	206	195	198	203	186	178	174	176			41
39	0	174	130	140	66	169	105	153	85	0	157	159	183	200	206	210	202	209	205	203	204	194	171	178	169	173	147				39
37		141	112	0	0	103	113	83	100	187	127	168	192	198	209	204	186	186	196	195	192	176	146	159	175	171					37
35		0	112	111	0	129	142	128	100	130	133	176	192	208	217	201	202	207	202	213	197	166	190	187	187	173					35
33			0	141	125	145	109	163	0	177	135	184	185	199	203	203	203	199	203	207	192	189	181	189	161						33
31					130	117	151	122	151	132	144	169	169	177	184	200	197	198	205	195	190	187	168	176							31
29											104	163	159	176	188	183	182	175	184	177	175	170	172								29
27													243	160	166	145						183	169								27
25														156	169							204	162								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 5-11. Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-6} yr^{-1} Probability of Occurrence by 2° Boxes

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	144	130	158	142	91	103	159	168	164	198	180	199	186	186	183	213	195	169										191		47
45	117	138	123	167	152	85	124	115	148	137	174	195	203	207	207	214	223	216	212	208	183	210					210	95	166	179	45
43	84	119	113	71	148	108	169	156	159	164	195	200	197	211	215	222	224	221	221	216	211	215		184	203	176	179	169	172	170	43
41	133	0	100	0	0	130	153	131	121	165	181	200	207	222	226	224	229	234	220	229	229	220	221	222	209	202	201	200			41
39	152	151	130	148	83	146	118	160	113	88	187	188	210	225	231	234	225	231	229	227	229	219	199	204	198	202	172				39
37		162	142	81	0	108	128	105	124	169	157	193	218	224	233	229	213	213	222	220	218	201	174	186	202	194					37
35		159	134	140	0	138	151	134	98	145	153	199	219	232	241	227	227	232	227	235	221	192	215	212	213	195					35
33			76	160	153	140	136	176	0	161	156	210	213	224	228	228	228	225	228	232	219	215	208	214	188						33
31					135	140	142	148	145	151	161	195	199	205	211	225	223	225	230	220	217	213	195	193							31
29											123	182	183	201	214	211	211	204	211	205	203	198	199								29
27													203	186	196	173						212	198								27
25														181	192							227	191								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 5-12. Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 2° Boxes

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	166	289	192	168	158	143	182	192	185	230	199	207	192	193	193	246	227	214										261		47
45	0	153	164	205	186	130	144	139	167	163	202	214	216	216	216	223	237	229	229	229	200	257						102	185	210	45
43	111	136	151	107	165	133	196	194	182	184	210	220	211	223	223	230	232	229	229	232	220	226		209	223	197	193	178	184	179	43
41	149	0	164	0	113	150	170	149	140	193	192	211	217	230	234	232	237	243	228	239	238	228	231	237	222	214	209	211			41
39	0	211	171	181	124	206	150	192	136	106	195	197	217	232	238	243	235	242	238	236	237	227	206	212	204	208	183				39
37		181	157	101	0	149	157	134	147	223	169	205	225	231	241	237	220	220	229	228	225	210	184	195	210	206					37
35		0	156	156	0	170	182	169	146	171	174	212	226	240	249	233	235	240	235	246	230	202	226	223	222	208					35
33			50	181	167	184	154	201	105	214	176	220	219	232	235	236	236	231	235	239	225	222	216	224	196						33
31					171	161	190	164	189	173	183	206	204	212	217	232	230	231	238	228	223	220	204	209							31
29											149	201	195	210	221	216	216	209	217	211	209	204	206								29
27													275	196	201	183						217	203								27
25														193	204							235	196								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 5-13. Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 2° Boxes

Figure 5-14 shows the distribution of tornadoes by 4° boxes. The design wind speeds for the 4° boxes are shown in Figures 5-15 through 5-20. Figures 5-15 and 5-16 show the expected and upper bound wind speeds, respectively, for the 10^{-5} yr^{-1} probability level. Figures 5-17 and 5-18 show the wind speeds for the 10^{-6} yr^{-1} probability level, and Figures 5-19 and 5-20 show the wind speeds for the 10^{-7} yr^{-1} probability level.

	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	
45	57	39	39	80	136	304	882	818	349	134	46			4	33	45
41	24	16	71	120	142	871	1043	1831	1757	1149	1069	277	288	456	26	41
37	35	78	27	71	41	1399	2047	2233	1398	1829	1243	481	816	25		37
33	1	96	96	117	53	824	2545	2745	1733	1714	972	969	455			33
29			19	41	38	435	1181	2357	1910	1431	1262	411				29
25							160	418			584	1039				25
	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	

Figure 5-14. Number of Tornado Events in the United States From 1950 through August 2003 by 4° Boxes

	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	
45	0	0	0	0	0	107	123	127	148	136	111			78	87	45
41	0	0	0	0	0	113	143	155	161	155	153	150	125	113	86	41
37	0	0	0	0	0	102	153	165	152	158	151	118	125	84		37
33	0	0	0	0	0	116	153	166	162	164	145	138	134			33
29			0	0	0	100	125	146	150	156	140	123				29
25							105	116			142	121				25
	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	

Figure 5-15. Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 4° Boxes

	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	
45	0	87	0	0	79	123	128	132	157	150	131			188	113	45
41	0	0	0	68	77	122	148	158	165	159	157	158	134	119	105	41
37	78	0	0	0	0	108	156	169	155	162	155	124	130	102		37
33	0	0	0	78	0	126	157	170	165	169	149	144	141			33
29			0	0	73	110	128	149	153	160	144	130				29
25							115	121			147	126				25
	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	

Figure 5-16. Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-5} yr^{-1} Probability of Occurrence by 4° Boxes

	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	
45	93	109	90	88	116	150	163	166	184	175	153			125	135	45
41	0	0	80	110	114	155	180	190	196	190	188	186	165	154	135	41
37	109	84	0	89	83	146	188	200	187	194	187	160	164	133		37
33	118	100	89	114	90	158	189	200	196	199	182	176	173			33
29			90	100	103	144	164	182	186	191	178	162				29
25							149	159			180	161				25
	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	

Figure 5-17. Expected Maximum Tornado Wind Speeds with a 10^{-6} yr $^{-1}$ Probability of Occurrence by 4° Boxes

	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	
45	108	136	115	105	131	165	168	171	194	188	170			225	155	45
41	0	0	94	125	129	164	185	195	201	195	194	194	174	160	149	41
37	130	100	96	110	106	153	193	205	192	198	192	164	169	146		37
33	0	113	104	131	116	168	193	205	201	204	186	182	179			33
29			116	118	127	155	168	186	190	196	182	169				29
25							157	163			184	165				25
	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	

Figure 5-18. Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-6} yr^{-1} Probability of Occurrence by 4° Boxes

	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	
45	139	152	136	135	158	188	198	201	217	210	189			165	172	45
41	107	92	129	152	156	193	213	222	228	223	221	219	202	190	172	41
37	152	133	111	135	131	184	221	231	220	226	220	195	200	171		37
33	159	144	136	156	136	196	221	232	228	231	214	212	207			33
29			137	145	147	183	199	215	219	223	211	197				29
25							185	194			213	195				25
	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	

Figure 5-19. Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 4° Boxes

	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	
45	153	177	159	151	172	203	203	206	227	224	206			260	192	45
41	122	116	143	167	170	202	219	228	234	228	227	228	210	196	185	41
37	171	147	143	155	151	192	226	237	225	231	225	200	205	182		37
33	0	157	149	172	159	205	227	238	234	237	220	218	214			33
29			159	162	168	193	204	220	223	229	216	204				29
25							193	199			217	199				25
	122	118	114	110	106	102	98	94	90	86	82	78	74	70	66	

Figure 5-20. Upper Limit (95 Percent) on the Expected Maximum Tornado Wind Speeds with a 10^{-7} yr^{-1} Probability of Occurrence by 4° Boxes

6.0 Comparison of Results

Chapter 6 of NUREG/CR-4461, Rev. 1, compared the wind speed estimates generated by the methodology used in this study assuming the original Fujita Scale relating tornado damage to wind speeds with speeds estimated in the initial version of NUREG/CR-4461 (Ramsdell and Andrews 1986) and in a study for the U.S. Department of Energy (Boissonnade et al. 2000). The methods used in the analysis in NUREG/CR-4461, Rev. 1, gave maximum wind speed estimates that tended to be about 20 mph lower than the estimates of either of the other two analyses.

This chapter presents a comparison of wind speeds estimated using the methodology of NUREG/CR-4461, Rev. 1, assuming the Enhanced Fujita Scale with wind speeds estimated using the same methodology assuming the original Fujita Scale. Wind speed estimates for 10^{-5}, 10^{-6}, and 10^{-7} yr^{-1} probability striking a building with a 200-ft characteristic dimension are compared.

Table 6-1 lists the wind speeds estimated for 73 nuclear power plant site in the United States. The expected wind speeds for each of the locations have been extracted from the tables in Appendices A in NUREG/CR-4461, Rev. 1, and in this report. Blanks in the table indicate that the wind speed at the given probability level would have been less than 65 mph. Figure 6-1 compares the 10^{-7} yr^{-1} probability level wind speeds graphically. The numbers shown in the figure are the index number for the site listed in the first column of Table 6-1.

Table 6-2 lists wind speeds estimated for representative cities throughout the United States. The expected wind speeds for each of the locations have been extracted from the tables in Appendices A in NUREG/CR-4461, Rev. 1, and in this report. Blanks in the table indicate that the wind speed at the given probability level would have been less than 65 mph. Figure 6-2 compares the 10^{-7} yr^{-1} probability level wind speeds graphically. The numbers shown in the figure are the index number for the city listed in the first column of Table 6-2.

Both figures indicate the high correlation between wind speeds estimated using the Enhanced Fujita Scale and those estimated using the original Fujita Scale that would be expected.

Table 6-1. Tornado Wind Speed Estimates for United States Nuclear Power Plant Sites

		Fujita Scale			Enhanced Fujita Scale		
Index	**Power Plant**	**1E-05**	**1E-06**	**1E-07**	**1E-05**	**1E-06**	**1E-07**
1	Arkansas Nuclear	198	250	297	160	195	227
2	Beaver Valley	141	203	256	124	164	199
3	Big Rock Point	108	175	229	103	146	183
4	Braidwood	185	240	288	152	188	220
5	Browns Ferry	206	257	303	166	200	232
6	Brunswick	166	221	270	140	178	214
7	Byron	185	240	288	152	188	220
8	Callaway	171	228	278	143	180	213
9	Calvert Cliffs	147	205	256	128	167	202
10	Catawba	168	223	271	142	180	215
11	Clinton	202	254	300	163	198	229
12	Columbia Generating Station	59	143	210	78	127	167
13	Comanche Peak	168	225	275	141	178	211
14	Cooper	209	260	306	168	202	234
15	Crystal River	167	227	278	141	179	212
16	D. C. Cook	202	254	301	163	198	229
17	Davis-Besse	185	240	288	152	188	220
18	Diablo Canyon		74	153		86	134
19	Dresden	185	240	288	152	188	220
20	Duane Arnold	209	260	306	168	202	234
21	Edwin I. Hatch	172	228	278	143	181	213
22	Fermi	185	240	288	152	188	220
23	Fort Calhoun	196	249	296	159	194	226
24	Ginna	150	208	259	130	169	203
25	Grand Gulf	194	247	295	158	193	225
26	H. B. Robinson	158	214	264	135	173	208
27	Haddam Neck	146	204	255	127	166	201
28	Hope Creek	146	205	256	127	166	202
29	Indian Point	146	204	255	127	166	201
30	James A. Fitzpatrick	150	208	259	130	169	203
31	Joseph M. Farley	179	234	283	148	184	217
32	Kewaunee	177	232	280	146	183	216
33	La Salle County	185	240	288	152	188	220
34	LaCrosse	186	240	289	153	189	221
35	Limerick	146	205	256	127	166	202
36	Maine Yankee	79	156	214	85	134	172
37	McGuire	168	223	271	142	180	215
38	Millstone	146	204	255	126	165	200
39	Monticello	190	242	289	155	191	223
40	Nine Mile Point	150	208	259	130	169	203
41	North Anna	147	205	256	128	167	202
42	Oconee	175	230	280	145	182	215
43	Oyster Creek	146	205	256	127	166	202
44	Palisades	202	254	301	163	198	229
45	Palo Verde		80	158		89	136

Table 6-1. (contd)

		Fujita Scale			Enhanced Fujita Scale		
Index	**Power Plant**	**1E-05**	**1E-06**	**1E-07**	**1E-05**	**1E-06**	**1E-07**
46	Peach Bottom	139	199	250	123	162	198
47	Perry	186	240	288	153	188	221
48	Pilgrim	143	203	254	126	165	200
49	Point Beach	177	232	280	146	183	216
50	Prairie Island	192	245	293	156	192	224
51	Quad-Cities	209	260	306	168	202	234
52	Rancho Seco		93	168		97	142
53	River Bend	152	213	265	131	170	204
54	Salem	146	205	256	127	166	202
55	San Onofre		113	185		110	153
56	Seabrook	143	203	254	126	165	200
57	Sequoyah	186	239	287	154	188	221
58	Shearon Harris	163	219	268	138	177	212
59	South Texas Project	132	198	253	118	161	196
60	St. Lucie	142	203	255	126	164	198
61	Summer	158	214	264	135	173	208
62	Surry	147	205	256	128	167	202
63	Susquehanna	157	213	262	134	173	209
64	Three Mile Island	139	199	250	123	162	198
65	Trojan		84	161		92	138
66	Turkey Point	128	191	245	116	157	191
67	Vermont Yankee	146	204	255	127	166	201
68	Vogtle	158	214	264	135	173	208
69	Waterford	152	213	265	131	170	204
70	Watts Bar	186	239	287	152	188	221
71	Wolf Creek	208	259	305	167	201	233
72	Yankee-Rowe	146	204	255	127	166	201
73	Zion	202	254	301	163	198	229

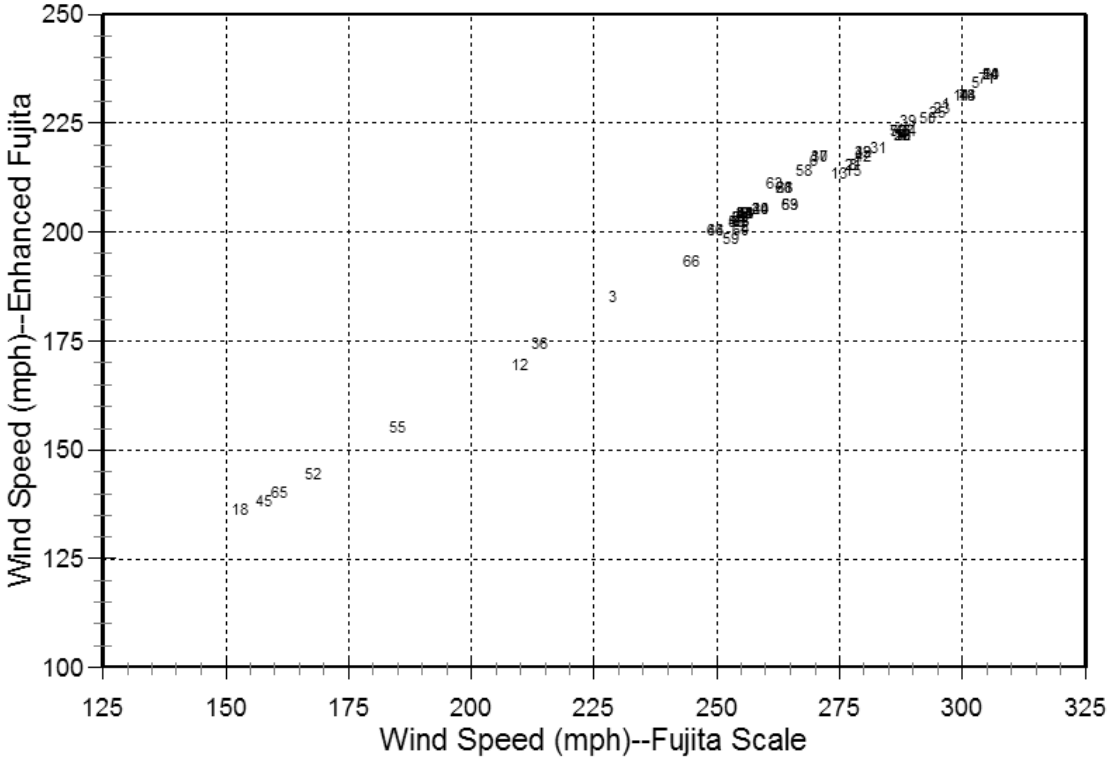

Figure 6-1. Comparison of 10^{-7} yr^{-1} Probability Level Wind Speeds Estimated for United States Nuclear Power Plant Sites

Table 6-2. Tornado Wind Speed Estimates for Representative Cities in the United States

			Fujita Scale			Enhance Fujita Scale		
Index	**City**	**State**	**1E-05**	**1E-06**	**1E-07**	**1E-05**	**1E-06**	**1E-07**
1	Albuquerque	New Mexico		99	173		101	145
2	Atlanta	Georgia	182	237	285	150	186	219
3	Baton Rouge	Louisiana	152	213	265	131	170	204
4	Birmingham	Alabama	206	257	303	166	200	232
5	Bismark	North Dakota	152	211	263	130	169	203
6	Boise	Idaho		103	177		104	148
7	Boston	Massachusetts	143	203	254	126	165	200
8	Burlington	Vermont	99	168	223	97	141	179
9	Charleston	West Virginia	76	158	219	83	135	174
10	Cheyenne	Wyoming	92	167	233	97	142	181
11	Chicago	Illinois	202	254	301	163	198	229
12	Cleveland	Ohio	186	240	288	153	188	221
13	Columbia	South Carolina	158	214	264	135	173	208
14	Columbus	Ohio	182	237	285	150	186	219
15	Dallas	Texas	168	225	275	141	178	211
16	Denver	Colorado	107	179	244	106	149	187
17	Des Moines	Iowa	201	253	300	162	197	229
18	El Paso	Texas		110	182		108	151
19	Grand Rapids	Michigan	201	253	300	163	197	229
20	Helena	Montana		48	136		71	124
21	Houston	Texas	166	225	275	140	178	211
22	Indianapolis	Indiana	197	249	296	159	195	227
23	Jackson	Mississippi	194	247	295	158	193	225
24	Jacksonville	Florida	144	205	256	127	165	199
25	Kansas City	Kansas	209	260	306	168	202	234
26	Knoxville	Tennessee	128	193	247	115	157	192
27	Las Vegas	Nevada		86	161		92	138
28	Little Rock	Arkansas	200	251	298	161	196	228
29	Los Angeles	California		128	197		118	160
30	Louisville	Kentucky	181	236	285	150	186	218
31	Madison	Wisconsin	187	242	290	153	189	221
32	Memphis	Tennessee	196	249	296	159	194	227
33	Miami	Florida	128	191	245	116	157	191
34	Minneapolis	Minnesota	192	245	293	156	192	224
35	Mobile	Alabama	166	224	275	140	178	211
36	Nashville	Tennessee	210	260	305	169	203	235
37	New York	New York	81	157	216	86	135	172
38	Norfolk	Virginia	167	222	271	141	179	213
39	Oklahoma City	Oklahoma	221	271	316	176	210	241
40	Omaha	Nebraska	191	244	292	156	191	224
41	Phoenix	Arizona		80	158		89	136
42	Pierre	South Dakota	138	200	253	122	162	197
43	Pittsburgh	Pennsylvania	141	203	256	124	164	199
44	Portland	Maine	72	151	210	81	131	169
45	Portland	Oregon		84	161		92	138
46	Raleigh	North Carolina	163	219	268	138	177	212
47	Rochester	New York	150	208	259	130	169	203
48	Salt Lake City	Utah	41	129	197	65	118	160

Table 6-2. (contd)

			Fujita Scale			Enhance Fujita Scale		
Index	**City**	**State**	**1E-05**	**1E-06**	**1E-07**	**1E-05**	**1E-06**	**1E-07**
49	San Antonio	Texas	148	208	259	128	167	201
50	San Diego	California		81	157		89	135
51	San Francisco	California	43	132	201	67	121	162
52	Seattle	Washington		98	172		100	144
53	Spokane	Washington		94	168		98	142
54	St Louis	Missouri	171	228	278	143	180	213
55	Tallahassee	Florida	150	211	264	130	169	203
56	Tampa	Florida	167	227	278	141	179	212
57	Tulsa	Oklahoma	196	249	296	159	194	227
58	Washington	D.C.	147	205	256	128	167	202
59	Wichita	Kansas	208	259	305	167	201	233

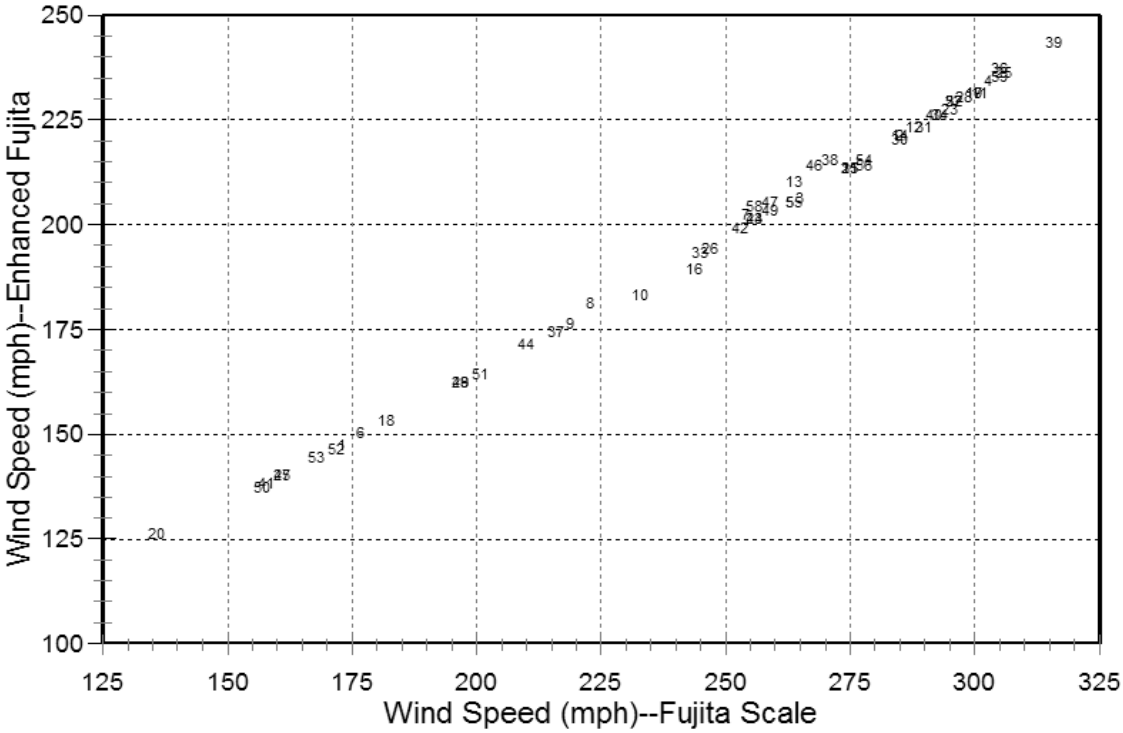

Figure 6-2. Comparison of 10^{-7} yr^{-1} Probability Level Wind Speeds Estimated for Representative Cities in United States

7.0 Uncertainty

This chapter addresses uncertainties associated with estimation of tornado strike probabilities and wind speeds. Many of the uncertainties arise from the subjective nature of determination of such fundamental characteristics as the length, width, and intensity of individual tornadoes. Other uncertainties arise from the models used to describe the tornado footprint and the probability distributions for the areas, lengths, and wind speeds of tornadoes.

7.1 Tornado Footprint Model

The basic model of a tornado footprint is a rectangle characterized by the width and length of the tornado path. Within the rectangle that defines the footprint, there are smaller rectangles associated with various wind speed thresholds. It is unlikely that any footprint is truly rectangular. However, the information in the NCDC tornado database does not support a more complex footprint model. Segmentation of tornadoes on the basis of changes in direction of motion since 1996 provides for improved representation of tornado footprints. Nevertheless, a rectangular footprint is still assumed for each segment.

The area of each segment is estimated by the product of the segment length and width. Most likely, the typical tornado footprint is narrow on the ends and widest at some point in the middle; the area of the footprint thus will be correct only if the average width of the tornado is used in calculation of the area. Average footprints were recorded for tornadoes prior to 1994. Since then, the maximum tornado width has been recorded. As a result, the tornado footprint model will lead to overestimates of the average tornado event area and, therefore, to overestimates of strike probabilities for point structures.

The analysis presented in this report accounts for the variation of wind speeds within the rectangle, but it does not account for possible deviations of actual tornado footprint shapes from the assumed rectangular shape. Accounting for the variation of wind speed within the footprint in the current analysis represents an advance over the assumptions used in the analysis in the initial version of NUREG/CR-4461.

7.2 Length, Width, and Area

The fundamental characteristics of tornadoes are generally assessed after the fact from damage caused by the tornado. The damage depends on the intensity of the tornado and the nature of the surface where the tornado occurs. General guidelines existed for assessing the damage, but, ultimately, the characterization is subjective. It is necessary to distinguish the area damaged by the tornado from the area covered by debris scattered by the tornado.

The Enhanced Fujita Scale (TTU 2006) includes far more comprehensive guidelines for evaluation of tornado intensities. However, those guidelines were not used to estimate the intensities of tornadoes listed in the tornado database used as a basis for the analysis in this report.

Resolution of reported tornado lengths and widths in the NCDC database is sufficient to ensure that resolution of the lengths and widths is not a significant source of uncertainty. Both tornado length and width tend to increase with increasing tornado intensity. It is likely that the more intense the tornado, the better the estimates of tornado dimensions. Less than 17 percent of the total footprint area in the contiguous United States during the study period was associated with F0 and F1 tornadoes. As a result, it seems unlikely that potential errors associated with estimation of the lengths and widths of these tornadoes would significantly affect the estimation of strike probabilities for point structures. The evaluation of the effect of the unreported F0 tornadoes discussed in Section 3.1 supports the conclusion that uncertainty in the lengths and widths (areas) of F0 and F1 tornadoes is unlikely to be a significant source of uncertainty in the strike probabilities for point structures. Given the typical dimensions of F2, F3, F4, and F5 tornadoes, it seems unlikely that uncertainties in reported lengths and widths would result in a factor-of-2 uncertainty in the total footprint area or point-structure strike probabilities.

The life-line term used to account for finite structure size on strike probabilities depends on tornado length and a characteristic dimension for the structure. Of the fundamental tornado characteristics, the tornado length is likely to be the characteristic that can be estimated most accurately if it assumed that absolute errors in the estimation of length and width are about equal. Consequently, the uncertainty in the life-line term associated with uncertainty in the expected tornado length is likely to be less than the uncertainty in the point-structure strike probability. The characteristic structure dimension assumed in this analysis is 200 ft. This assumption will lead to under- or overestimates of the life-line term for structures that have larger or smaller characteristic dimensions. For structures that have larger characteristic dimensions, finite-structure corrections should be larger than those presented in the appendices, and for structures that have smaller characteristic dimensions, the finite-structure corrections should be smaller.

No effort has been made to make more quantitative estimates of the uncertainties in the reported tornado lengths and widths than those presented above or to account for these uncertainties in assessing expected values or confidence intervals. The results of the analyses presented in the appendices contain sufficient information to adjust the finite-structure corrections for differences in characteristic structure dimensions. The finite-structure strike probabilities may be scaled up or down for larger or smaller structures by multiplying the strike probabilities by the ratio of the characteristic dimension for the new building to the assumed characteristic dimension (200 ft).

7.3 F Scale

Classification of tornado intensities is subjective. It depends on assessment of damage to vegetation and structures, and in turn, the extent of the damage depends on the types of vegetation present and the types of construction of structures. As a result, it is likely that there are errors in the F Scales assigned to tornadoes in the NCDC database. Twisdale et al. (1978) and Twisdale and Dunn (1981) present information that may be used to compensate for potential classification errors. This information is included in Reinhold and Ellingwood (1982).

Summarized tornado area and length statistics were adjusted to account for potential errors in assigned F Scales using the information presented by and Twisdale et al. (1978) and Twisdale and Dunn (1981). The total area and length of tornado footprints were calculated following adjustment and compared with the statistic calculated without the adjustment. Table 7-1 shows the changes in dimensions. The increase in area is significant; the change in length may not be. In any case, compensation for potential classification errors using tornado statistics does not conserve the total dimensions.

Table 7-1. Changes in Tornado Impact Statistics Associated with Compensation for Potential Classification Errors

		With Compensation for Potential Classification Errors	
	Unmodified NCDC Tornado Data	**Twisdale et al. (1978)**	**Twisdale and Dunn (1981)**
Total Area (mi^2)	30398	44806	36235
Total Length (mi)	198750	197013	199975

A second effect of adjustment to account for potential classification errors is a large increase in the total area and length of the portion of tornado paths associated with F4 and F5 intensities. The adjustment using information presented by Twisdale et al. (1978) results in an increase in area with F4 and F5 intensity by 20 percent and in length by 7 percent. Using the information from Twisdale and Dunn (1981), the increases in area and length were about 65 percent and 70 percent, respectively. When area and length associated with F5 tornadoes are considered, the increases are more pronounced. Using the information from Twisdale et al. increases the area by about 50 percent and the length by about 30 percent. The information from Twisdale and Dunn increases the area by more than a factor of 2 and the length by more than a factor of 3. Changing to the Enhanced Fujita Scale will not affect this conclusion.

Considering 1) that the compensation matrices do not conserve total area or length when applied to tornado statistics and 2) that the matrices significantly increase the area and length associated with the highest wind speeds, no adjustment of tornado statistics for potential classification errors has been made in this update.

7.4 Association of Wind Speeds with F Scales

Even prior to the forum convened by Texas Tech University, it was suggested that the wind speeds associated with the Fujita F Scales were too high (e.g., Twisdale et al. 1978). Although Reinhold and Ellingwood (1982) use the Fujita wind speeds, they indicate that the speeds, particularly for stronger tornadoes, are likely to be too high. Wind speed ranges suggested by Twisdale et al. (1978) for F0 through F5 tornadoes are listed in Table 7-2. Experts evaluating these relationships for a Monte-Carlo tornado model being prepared at the Lawrence Livermore National Laboratory (LLNL) (Boissonade et al. 2000) assigned weights to the Fujita, Twisdale-Uniform, Twisdale-Linear relationships of 0.6, 0.078, and 0.322, respectively. This indicates that experts in the field still tended to favor the Fujita relationships. The panel also proposed its own relationship, shown in the next-to-last column of Table 7-2. This was done to account for F Scale classification errors. The relationships were compared graphically in Figure 7-1 of NUREG/CR-4461, Rev. 1 using curves based for the entire contiguous United States.

Table 7-2 and Figure 7.1 of NUREG/CR-4461, Rev. 1, have been expanded to include the wind speeds of the Enhanced Fujita Scale (TTU 2006). The Enhanced Fujita Scale wind speed probability curve is similar to the curves for the Twisdale linear relationship and the relationship proposed by the LLNL panel of experts.

Table 7-2. Tornado F Scale Intensity Wind Speed Relationships

Intensity	Description	Fujita Scale (mph)	Twisdale-Uniform (mph)	Twisdale-Linear (mph)	Expert Panel (mph)	TTU Forum (mph)
F0	Light damage	40 to 72	40 to 65	40 to 73	40 to 75	65 to 85
F1	Moderate damage	73 to 112	65 to 96	73 to 103	75 to 105	86 to 110
F2	Considerable damage	113 to 157	96 to 114	103 to 135	105 to 135	111 to 135
F3	Severe damage	158 to 206	114 to 139	135 to 168	135 to 170	136 to 165
F4	Devastating damage	207 to 260	139 to 181	168 to 209	170 to 215	166 to 200
F5	Incredible damage	261 to 318	181 to 236	209 to 277	215 to 270	>200

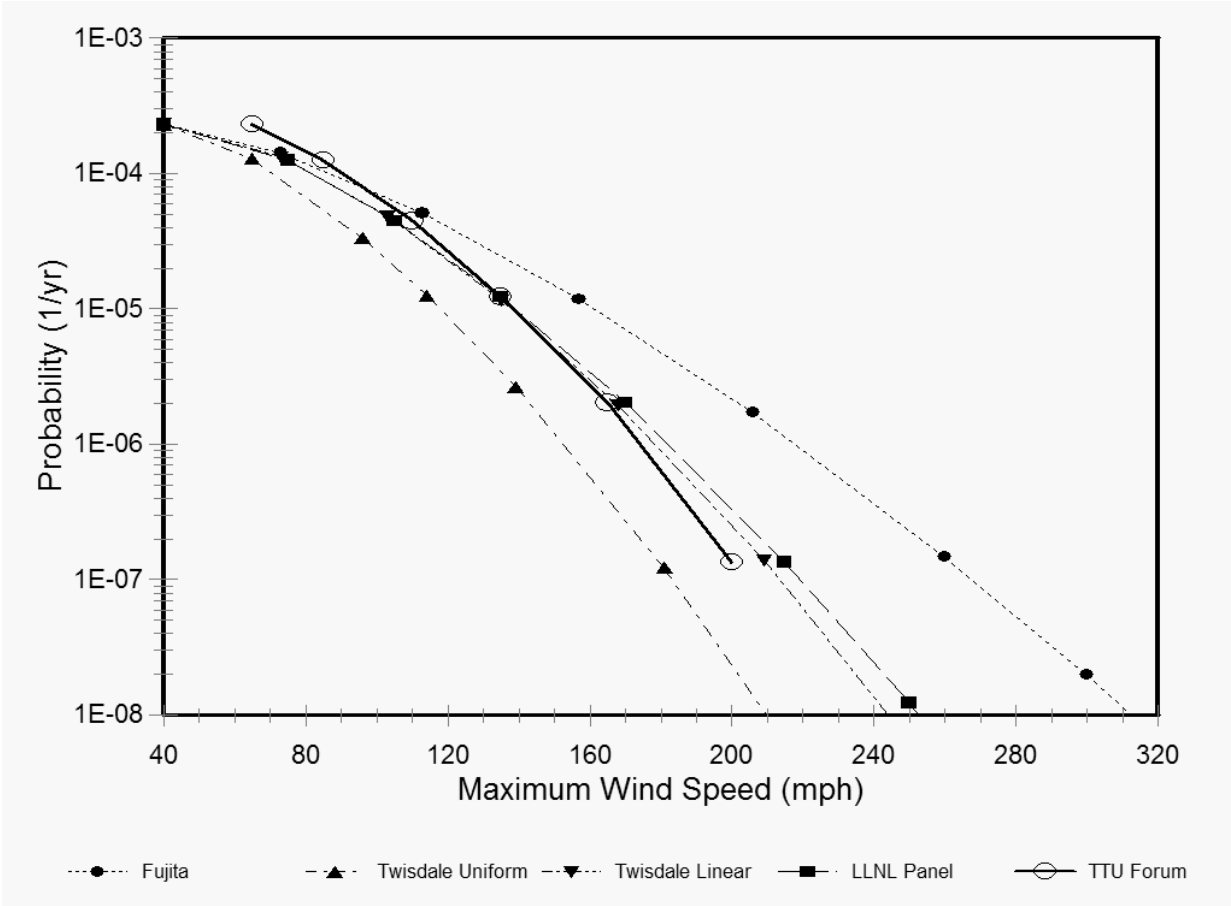

Figure 7-1. Comparison Tornado Maximum Wind Speed Probability Estimates Resulting from Use of Five Relationships Between F Scale and Wind Speed

7.5 Natural Variation in Tornado Dimensions

The previous sections in this chapter deal with uncertainty associated with estimates of tornado dimensions. This section deals with uncertainty in the estimates of the expected area and length of tornadoes associated with the natural variability of tornado dimensions and the finite sample size used to estimate the expected values. This uncertainty is treated explicitly in these analyses by assuming that tornado path length and area have lognormal distribution. The details of estimation of the confidence intervals for the expected values for lognormal distributions are described in Section 2.2.

8.0 Recommendations

Information presented in Chapters 2.0, 5.0, and 6.0 is based on analysis of the tornado data using procedures described in Chapters 3.0 and 4.0. This chapter presents recommended tornado design characteristics for use in those instances where detailed analysis is not warranted. The recommendations are based on the results of the 2° box calculations.

The 2° box design wind speeds based on expected values show a good deal of spatial variation, particularly in the western United States. A nine-point low-pass filter was used to smooth out some of this variation. In the filter, the wind speed in each box surrounded by boxes with calculated speeds was replaced by a weighted-average of the expected speeds for the box and eight adjacent boxes. The original speed for the box was given a weight of 8 and a weight of 1 was given to the speeds in each of the other boxes. The resulting speeds are shown in Figures 8-1 through 8-3. The speeds shown in boxes along the borders are the original speed estimates.

Each of the figures is divided into three regions, numbered 1 through 3, as indicated by shading, and a design wind speed is suggested for each region. The suggested speed is based on the spatially averaged speeds in the region. However, other factors, such as number of reported tornadoes and population densities, have been considered in selecting the speeds and drawing the boundaries between regions. Table 8-1 lists the tornado design wind speeds for each region.

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	0	0	0	0	0	0	0	78	73	119	97	123	105	105	101	142	120	79										114		47
45	0	0	0	78	0	0	0	0	0	0	88	115	125	130	132	140	147	142	138	133	103	136						0	75	97	45
43	0	0	0	0	0	0	0	0	0	72	116	119	127	140	147	153	155	153	151	145	141	145		101	130	93	97	81	85	82	43
41	0	0	0	0	0	0	0	0	0	76	97	120	134	150	157	157	161	163	155	159	158	152	153	154	129	120	127	126			41
39	0	0	0	0	0	0	0	65	0	0	106	107	138	156	163	163	158	160	160	158	157	145	128	129	126	127	86				39
37		67	0	0	0	0	0	0	0	82	0	114	144	158	165	162	151	151	157	155	149	131	106	116	127	118					37
35		0	0	0	0	0	0	0	0	0	0	121	146	161	169	160	158	160	159	162	149	125	133	131	124	120					35
33			0	0	0	0	0	91	0	70	0	134	140	153	159	160	160	159	161	161	149	142	134	140	112						33
31					0	0	0	0	0	0	66	115	125	135	144	154	153	155	157	150	145	139	119	120							31
29		Region 1 -- 160 mph									0	100	101	126	135	140	140	131	140	132	130	122	127								29
27		Region 2 -- 140 mph											130	106	118	72						141	126								27
25		Region 3 --100 mph												98	114							161	116								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 8-1. Recommended Tornado Design Wind Speeds for the 10^{-5} yr^{-1} Probability Level

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	100	83	116	98	0	0	117	127	124	160	141	164	150	150	146	179	160	131										155		47
45	0	92	72	127	109	0	71	0	104	111	137	157	165	170	171	178	184	180	177	172	146	175						0	127	142	45
43	0	0	0	0	104	0	129	114	118	120	148	160	166	178	183	188	191	189	188	182	179	182		147	169	138	141	131	134	133	43
41	84	0	0	0	0	80	110	83	68	125	142	161	173	186	192	192	196	198	191	194	193	188	188	189	168	161	166	165			41
39	109	108	81	104	0	103	0	118	0	0	149	154	176	191	197	198	193	196	195	194	192	182	168	168	165	166	135				39
37		121	97	0	0	0	78	0	71	129	115	155	181	193	200	197	188	187	192	190	185	170	152	158	166	158					37
35		118	86	94	0	92	108	87	0	101	122	157	183	196	203	195	194	195	194	197	186	166	172	171	161	160					35
33			0	118	110	96	95	136	0	120	122	161	178	189	194	195	195	194	196	196	186	179	172	178	154						33
31					89	93	98	104	102	108	119	148	165	173	181	189	189	190	193	186	182	177	160	160							31
29		Region 1 -- 200 mph									72	143	146	166	174	178	178	170	178	171	169	164	165								29
27		Region 2 -- 170 mph											168	150	161	133						179	164								27
25		Region 3 --130 mph												144	157							196	157								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 8-2. Recommended Tornado Design Wind Speeds for the 10^{-6} yr^{-1} Probability Level

	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	
47	0	144	130	158	142	91	103	159	168	164	198	180	199	186	186	183	213	195	169										191		47
45	117	138	127	148	137	107	124	132	150	154	177	194	200	204	205	212	217	213	212	208	183	210						95	166	179	45
43	84	119	113	71	148	114	147	148	151	162	186	197	201	211	216	221	223	222	220	215	212	215		184	203	176	179	169	172	170	43
41	133	0	100	0	0	123	146	137	132	158	177	198	207	219	225	225	228	230	223	226	225	220	221	222	204	197	201	200			41
39	152	151	130	148	83	146	125	142	123	120	177	191	210	223	229	230	225	227	227	226	225	215	202	203	200	202	172				39
37		162	142	81	0	108	130	117	125	151	161	192	215	225	232	229	220	219	224	223	218	205	189	194	201	194					37
35		159	134	140	0	138	142	124	112	136	163	194	217	229	235	228	226	227	226	229	219	200	208	206	193	195					35
33			76	160	153	140	141	148	72	144	164	198	212	221	226	227	227	226	228	228	219	213	207	214	188						33
31					135	140	142	148	145	151	161	187	200	207	214	222	221	223	224	219	215	210	195	193							31
29		Region 1 -- 230 mph									123	182	183	200	208	211	211	204	211	205	203	198	199								29
27		Region 2 -- 200 mph											203	186	196	173						212	198								27
25		Region 3 --160 mph												181	192							227	191								25
	124	122	120	118	116	114	112	110	108	106	104	102	100	98	96	94	92	90	88	86	84	82	80	78	76	74	72	70	68	66	

Figure 8-3. Recommended Tornado Design Wind Speeds for the 10^{-7} yr^{-1} Probability Level

Table 8-1. Recommended Tornado Design Wind Speeds

	Wind Speed (mph)		
Design Probability (yr^{-1})	**Region 1**	**Region 2**	**Region 3**
1.0×10^{-5}	160	140	100
1.0×10^{-6}	200	170	130
1.0×10^{-7}	230	200	160

9.0 References

Boissonnade, A., Q. Hossain, J. Kimball, R. Mensing, and J. Savy. 2000. *Development of a Probabilistic Tornado Hazard Model for the Continental United States Volume I: Main Report*. UCRL-ID-140922-Vol-1, Lawrence Livermore National Laboratory, Livermore, California.

Fujita, T. T. 1971. "A Proposed Characterization of Tornadoes and Hurricanes by Area and Intensity." Research Paper No. 91, Satellite and Mesometeorology Research Project, University of Chicago, Chicago, Illinois.

Fujita, T. T. 1978. *Workbook of Tornadoes and High Winds for Engineering Applications*. Research Paper No. 165, Satellite and Mesometeorology Research Project, University of Chicago, Chicago, Illinois.

Garson, R. C., J. M. Catalan, and C. A. Cornell. 1975. "Tornado Design Winds Based on Risk." *Journal of the Structural Division, Proceedings of the American Society of Civil Engineers* 101, ST9:1883-1897.

Johnson, N. L., S. Kotz, and N. Balakrishnan. 1994. *Continuous Univariate Distributions, Volume 1*. 2nd ed. John Wiley and Sons, Inc., New York.

Markee, E. H., Jr., J. G. Beckerley, and K. E. Sanders. 1974. *Technical Basis for Interim Regional Tornado Criteria*. WASH-1300, U.S. Atomic Energy Commission, Washington, D.C.

National Climatic Data Center (NCDC). 2004. "The Fujita Tornado Scale" at http://www.ncdc.noaa.gov/oa/satellite/satelliteseye/educational/fujita. Accessed February 25, 2004.

National Oceanographic and Atmospheric Administration (NOAA). 2006. "NOAA National Weather Service Improves Tornado Rating System." at http://www.noaanews.noaa.gov/stories2006/s2573.htm. Accessed on July 21, 2006.

Nelder, J. A., and R. Mead. 1965. "A Simplex Method for Function Minimization." *Computer Journal* 7:308-313.

Ramsdell, J. V., and G. L. Andrews. 1986. *Tornado Climatography of the Contiguous United States*. NUREG/CR-4461, U.S. Nuclear Regulatory Commission, Washington, D.C.

Reinhold, T. A., and B. Ellingwood. 1982. *Tornado Damage Risk Assessment*. NUREG/CR-2944, U.S. Nuclear Regulatory Commission, Washington, D.C.

Shreck, R. I., and W. F. Sandusky. 1982. *Tornado: A Program to Compute Tornado Strike and Intensity Probabilities with Associated Wind Speeds and Pressure Drops at Nuclear Power Stations*. PNL-4483, Pacific Northwest Laboratory, Richland, Washington.

Texas Tech University (TTU). 2006. *A Recommendation for an Enhanced Fujita Scale.* Submitted to The National Weather Service and Other Interested Users, January 26, 2006. Wind Science and Engineering Center, Texas Tech University, Lubbock, Texas.

Thom, H.C.S. 1963. "Tornado Probabilities." *Monthly Weather Review* 91:730-736.

Twisdale, L. A., W. L. Dunn, and J. Chu. 1978. *Tornado Missile Risk Analysis, with Appendices.* EPRI NP-768 and 769, Electric Power Research Institute, Palo Alto, California.

Twisdale, L. A., and W. L. Dunn. 1981. *Tornado Missile Simulation and Design Methodology, Volumes 1 and 2.* EPRI NP-2005, Electric Power Research Institute, Palo Alto, California.

U.S. Atomic Energy Commission (AEC). 1974. "Design Basis Tornado for Nuclear Power Plants." Regulatory Guide 1.76, Washington, D.C.

Appendix A

Results for 2° Boxes

Appendix A

Results for 2° Boxes

This appendix contains the detailed results of the analysis for the 2° boxes. The output for each box generally consists seven lines. However, if there were no tornado events in the box or the information for the tornado events was insufficient to perform an analysis, then there is only one line of output. The first line of output starts with the latitude and longitude of the southeast corner of the box. The next two entries in the line are the land area for the box assumed in the analysis and the fraction of the total box area assumed to be covered by land. The last three items in the first line are the number of total events observed and the number of events included in the calculation of expected values of area and length for events. For some boxes, this is the only line. Care should be taken when using strike probability and wind speed data from this appendix to ensure that the number of tornado events is sufficient to give reasonable results. As a minimum, there should be 10 events, and 20 or more events are desirable.

The second through seventh lines include the results of the calculations. Lines two and three contain the results of the strike probability calculations for the point structure and life-line terms, respectively. In line two, the first number is the expected area, in square miles, for tornado events for the box; the second and third numbers are the lower and upper limits of the 90 percent confidence interval for the expected area. The last three numbers are the expected strike probability for a point structure and the lower and upper limits for the strike probability confidence interval. The format for the information in the third line is similar to that for the second line. The first three numbers are the expected length, in miles, for the life-line term and the lower and upper limits on the expected length. The last three numbers are the additional strike probability for finite structures, assuming a characteristic dimension of 200 ft for the structure.

The fourth line gives the expected total strike probability for the box and the lower and upper bounds of the 90 percent confidence interval. These values are the sums of the values direct above in lines two and three. Lines five through seven give the maximum wind speeds, in mile per hour, for 10^{-5} yr^{-1}, 10^{-6} yr^{-1}, and 10^{-7} yr^{-1} design criteria. As before, the first number is the expected value, and the second and third numbers are the lower and upper limits of the 90% confidence interval.

If a strike probability is desired for a different size structure, the values in line three should be adjusted by the ratio of the characteristic dimension for the structure to 200 ft. The new life-line terms should be added to the point structure terms to get the revised strike probabilities. The ratio of the new strike probability to the original strike probability may then be used to adjust the design criteria probability levels associated with the maximum wind speeds. For example, consider the box with its southeast corner at 25° N latitude, 80° W longitude. If the strike probability were desired for a larger structure, say one with a characteristic dimension of 400 ft, then the expected value of the life-line term (3.473×10^{-5} yr^{-1}) should be multiplied by two and added to the point structure term (3.643×10^{-5} yr^{-1}) to get the new expected strike probability (1.059×10^{-4} yr^{-1}). With this new expected strike probability, the 10^{-5} yr^{-1} design criterion associated with the 118 mph expected maximum wind speed should be increased to account for the change in strike probability. The new design criterion is the product of the old design criterion (10^{-5} yr^{-1}) and the ratio of

the new strike probability (1.059×10^{-4} yr^{-1}) to the original strike probability (7.116×10^{-5} yr^{-1}). Or, carrying out the arithmetic, the new design criterion is 1.488×10^{-5} yr^{-1}.

The lower limit for the maximum wind speed in a tornado is 65 mph. Two wind speeds less than 65 mph are used to provide information when the design wind speed would be less than 65 mph. A design wind speed of 50 mph indicates that the tornado strike probability for the box is less than 10^{-7} yr^{-1}. A design wind speed of 60 mph indicates that the design wind speed for the design probability specified at the beginning of the line is less than 65 mph, but that the design wind speed at the 10^{-7} yr^{-1} probability level exceeds 65 mph.

```
   25   80    1.200E+04 0.6991    499    420    420
Point  4.702E-02  3.458E-02  6.394E-02  3.643E-05  2.679E-05  4.954E-05
Line   1.183E+00  1.007E+00  1.391E+00  3.473E-05  2.955E-05  4.082E-05
Strike Probability, 1/yr               7.116E-05  5.634E-05  9.036E-05
1.0E-5 1/yr design speed                    116.       110.       122.
1.0E-6 1/yr design speed                    157.       152.       162.
1.0E-7 1/yr design speed                    191.       186.       196.

   25   82    2.136E+02 0.0124     67     64     64
Point  3.185E-02  1.674E-02  6.061E-02  1.861E-04  9.780E-05  3.542E-04
Line   1.745E+00  1.130E+00  2.696E+00  3.862E-04  2.500E-04  5.966E-04
Strike Probability, 1/yr               5.724E-04  3.478E-04  9.508E-04
1.0E-5 1/yr design speed                    161.       153.       170.
1.0E-6 1/yr design speed                    196.       189.       204.
1.0E-7 1/yr design speed                    227.       219.       235.


   25   96    3.206E+03 0.1868     68     58     58
Point  9.867E-02  3.876E-02  2.512E-01  3.899E-05  1.532E-05  9.924E-05
Line   1.444E+00  8.941E-01  2.333E+00  2.162E-05  1.338E-05  3.492E-05
Strike Probability, 1/yr               6.060E-05  2.870E-05  1.342E-04
1.0E-5 1/yr design speed                    114.       100.       129.
1.0E-6 1/yr design speed                    157.       146.       169.
1.0E-7 1/yr design speed                    192.       182.       204.

   25   98    4.916E+03 0.2864     38     34     34
Point  1.474E-01  6.133E-02  3.540E-01  2.122E-05  8.834E-06  5.100E-05
Line   1.638E+00  9.953E-01  2.697E+00  8.940E-06  5.430E-06  1.472E-05
Strike Probability, 1/yr               3.016E-05  1.426E-05  6.571E-05
1.0E-5 1/yr design speed                     98.        79.       113.
1.0E-6 1/yr design speed                    144.       131.       156.
1.0E-7 1/yr design speed                    181.       170.       193.
```

```
   27   80    1.307E+04 0.7753    544    458    458
Point  8.353E-02  6.253E-02  1.116E-01  6.476E-05  4.848E-05  8.652E-05
Line   1.818E+00  1.535E+00  2.153E+00  5.338E-05  4.507E-05  6.324E-05
Strike Probability, 1/yr                1.181E-04  9.354E-05  1.498E-04
1.0E-5 1/yr design speed                     126.       120.       131.
1.0E-6 1/yr design speed                     164.       159.       169.
1.0E-7 1/yr design speed                     198.       193.       203.

   27   82    5.478E+03 0.3249    518    465    465
Point  6.701E-02  4.907E-02  9.150E-02  1.181E-04  8.646E-05  1.612E-04
Line   1.485E+00  1.259E+00  1.752E+00  9.913E-05  8.403E-05  1.169E-04
Strike Probability, 1/yr                2.172E-04  1.705E-04  2.782E-04
1.0E-5 1/yr design speed                     141.       137.       146.
1.0E-6 1/yr design speed                     179.       175.       183.
1.0E-7 1/yr design speed                     212.       207.       217.

   27   94    8.392E+02 0.0498     19     16     17
Point  6.724E-03  3.076E-03  1.470E-02  2.836E-06  1.298E-06  6.199E-06
Line   5.204E-01  3.011E-01  8.994E-01  8.315E-06  4.811E-06  1.437E-05
Strike Probability, 1/yr                1.115E-05  6.109E-06  2.057E-05
1.0E-5 1/yr design speed                      72.        60.        93.
1.0E-6 1/yr design speed                     133.       121.       145.
1.0E-7 1/yr design speed                     173.       163.       183.

   27   96    9.254E+03 0.5488    331    244    247
Point  5.589E-02  3.934E-02  7.942E-02  3.725E-05  2.622E-05  5.292E-05
Line   1.228E+00  1.009E+00  1.495E+00  3.101E-05  2.548E-05  3.773E-05
Strike Probability, 1/yr                6.826E-05  5.170E-05  9.066E-05
1.0E-5 1/yr design speed                     118.       113.       124.
1.0E-6 1/yr design speed                     161.       156.       166.
1.0E-7 1/yr design speed                     196.       191.       201.

   27   98    1.559E+04 0.9247    115     98     98
Point  2.389E-01  1.163E-01  4.905E-01  3.283E-05  1.599E-05  6.741E-05
Line   2.186E+00  1.526E+00  3.133E+00  1.138E-05  7.943E-06  1.631E-05
Strike Probability, 1/yr                4.421E-05  2.393E-05  8.372E-05
1.0E-5 1/yr design speed                     106.        92.       118.
1.0E-6 1/yr design speed                     150.       140.       160.
1.0E-7 1/yr design speed                     186.       177.       196.

   27  100    2.098E+03 0.1244      7      6      6
Point  2.797E+00  1.708E-02  4.579E+02  1.739E-04  1.062E-06  2.847E-02
Line   6.350E+00  7.503E-01  5.375E+01  1.495E-05  1.767E-06  1.266E-04
Strike Probability, 1/yr                1.888E-04  2.829E-06  2.859E-02
1.0E-5 1/yr design speed                     130.        60.       209.
1.0E-6 1/yr design speed                     168.       101.       243.
1.0E-7 1/yr design speed                     203.       148.       275.

   29   80    6.000E+03 0.3628    245    212    212
Point  9.321E-02  5.948E-02  1.461E-01  7.092E-05  4.525E-05  1.111E-04
Line   1.968E+00  1.522E+00  2.543E+00  5.671E-05  4.387E-05  7.329E-05
Strike Probability, 1/yr                1.276E-04  8.913E-05  1.844E-04
1.0E-5 1/yr design speed                     127.       119.       134.
1.0E-6 1/yr design speed                     165.       158.       172.
1.0E-7 1/yr design speed                     199.       192.       206.
```

```
   29   82    1.405E+04 0.8492    251    227    228
Point  1.452E-01  9.395E-02  2.243E-01  4.833E-05  3.128E-05  7.468E-05
Line   2.829E+00  2.178E+00  3.674E+00  3.568E-05  2.748E-05  4.634E-05
Strike Probability, 1/yr                8.402E-05  5.876E-05  1.210E-04
1.0E-5 1/yr design speed                     122.       115.       129.
1.0E-6 1/yr design speed                     164.       158.       170.
1.0E-7 1/yr design speed                     198.       192.       204.

   29   84    8.647E+03 0.5229    271    230    233
Point  1.456E-01  9.658E-02  2.195E-01  8.502E-05  5.639E-05  1.282E-04
Line   2.092E+00  1.660E+00  2.636E+00  4.627E-05  3.672E-05  5.830E-05
Strike Probability, 1/yr                1.313E-04  9.311E-05  1.865E-04
1.0E-5 1/yr design speed                     130.       124.       136.
1.0E-6 1/yr design speed                     169.       164.       175.
1.0E-7 1/yr design speed                     203.       198.       209.

   29   86    5.759E+03 0.3482    308    261    263
Point  8.181E-02  5.572E-02  1.201E-01  8.152E-05  5.552E-05  1.197E-04
Line   1.512E+00  1.213E+00  1.884E+00  5.706E-05  4.579E-05  7.111E-05
Strike Probability, 1/yr                1.386E-04  1.013E-04  1.908E-04
1.0E-5 1/yr design speed                     132.       127.       137.
1.0E-6 1/yr design speed                     171.       166.       177.
1.0E-7 1/yr design speed                     205.       200.       211.

   29   88    7.421E+03 0.4487    309    262    262
Point  2.023E-01  1.331E-01  3.075E-01  1.570E-04  1.033E-04  2.385E-04
Line   2.562E+00  2.014E+00  3.260E+00  7.529E-05  5.917E-05  9.580E-05
Strike Probability, 1/yr                2.322E-04  1.624E-04  3.344E-04
1.0E-5 1/yr design speed                     140.       133.       146.
1.0E-6 1/yr design speed                     178.       172.       184.
1.0E-7 1/yr design speed                     211.       205.       217.

   29   90    1.446E+04 0.8744    387    367    367
Point  1.794E-01  1.316E-01  2.446E-01  8.947E-05  6.562E-05  1.220E-04
Line   2.553E+00  2.142E+00  3.043E+00  4.823E-05  4.046E-05  5.748E-05
Strike Probability, 1/yr                1.377E-04  1.061E-04  1.795E-04
1.0E-5 1/yr design speed                     131.       126.       135.
1.0E-6 1/yr design speed                     170.       166.       175.
1.0E-7 1/yr design speed                     204.       199.       209.

   29   92    1.031E+04 0.6231    446    420    420
Point  1.833E-01  1.365E-01  2.461E-01  1.478E-04  1.101E-04  1.984E-04
Line   2.652E+00  2.266E+00  3.104E+00  8.100E-05  6.921E-05  9.481E-05
Strike Probability, 1/yr                2.288E-04  1.793E-04  2.933E-04
1.0E-5 1/yr design speed                     140.       136.       144.
1.0E-6 1/yr design speed                     178.       174.       182.
1.0E-7 1/yr design speed                     211.       206.       216.

   29   94    1.405E+04 0.8492    664    588    592
Point  2.019E-01  1.501E-01  2.715E-01  1.778E-04  1.323E-04  2.391E-04
Line   2.132E+00  1.837E+00  2.475E+00  7.113E-05  6.129E-05  8.257E-05
Strike Probability, 1/yr                2.490E-04  1.935E-04  3.217E-04
1.0E-5 1/yr design speed                     140.       136.       145.
1.0E-6 1/yr design speed                     178.       174.       183.
1.0E-7 1/yr design speed                     211.       206.       216.
```

```
   29   96    1.654E+04 1.0000    493    443    443
Point  5.249E-01  3.560E-01  7.741E-01  2.916E-04  1.977E-04  4.299E-04
Line   3.380E+00  2.788E+00  4.097E+00  7.110E-05  5.865E-05  8.619E-05
Strike Probability, 1/yr               3.627E-04  2.564E-04  5.161E-04
1.0E-5 1/yr design speed                    145.       139.       151.
1.0E-6 1/yr design speed                    181.       176.       188.
1.0E-7 1/yr design speed                    214.       208.       221.

   29   98    1.654E+04 1.0000    226    196    196
Point  4.582E-01  2.611E-01  8.041E-01  1.167E-04  6.649E-05  2.047E-04
Line   2.753E+00  2.108E+00  3.595E+00  2.655E-05  2.033E-05  3.468E-05
Strike Probability, 1/yr               1.432E-04  8.682E-05  2.394E-04
1.0E-5 1/yr design speed                    128.       119.       137.
1.0E-6 1/yr design speed                    167.       159.       176.
1.0E-7 1/yr design speed                    201.       193.       210.

   29  100    1.363E+04 0.8241     77     75     75
Point  2.357E-01  9.465E-02  5.870E-01  2.481E-05  9.963E-06  6.179E-05
Line   2.581E+00  1.575E+00  4.230E+00  1.029E-05  6.280E-06  1.687E-05
Strike Probability, 1/yr               3.510E-05  1.624E-05  7.866E-05
1.0E-5 1/yr design speed                    101.        82.       117.
1.0E-6 1/yr design speed                    146.       134.       159.
1.0E-7 1/yr design speed                    183.       172.       195.

   29  102    1.363E+04 0.8241     66     63     63
Point  3.487E-01  1.401E-01  8.678E-01  3.146E-05  1.264E-05  7.830E-05
Line   2.385E+00  1.521E+00  3.740E+00  8.151E-06  5.199E-06  1.278E-05
Strike Probability, 1/yr               3.962E-05  1.784E-05  9.108E-05
1.0E-5 1/yr design speed                    100.        80.       120.
1.0E-6 1/yr design speed                    143.       125.       163.
1.0E-7 1/yr design speed                    182.       163.       201.

   29  104    5.776E+03 0.3492     10      6      6
Point  2.428E-02  5.625E-03  1.048E-01  7.832E-07  1.815E-07  3.381E-06
Line   3.607E-01  2.315E-01  5.621E-01  4.407E-07  2.828E-07  6.868E-07
Strike Probability, 1/yr               1.224E-06  4.643E-07  4.067E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     72.        60.       104.
1.0E-7 1/yr design speed                    123.       102.       149.

   31   78    4.027E+02 0.0249     16     15     15
Point  4.647E-02  1.371E-02  1.575E-01  3.440E-05  1.015E-05  1.166E-04
Line   1.691E+00  7.563E-01  3.780E+00  4.742E-05  2.121E-05  1.060E-04
Strike Probability, 1/yr               8.182E-05  3.136E-05  2.226E-04
1.0E-5 1/yr design speed                    120.       100.       139.
1.0E-6 1/yr design speed                    160.       143.       176.
1.0E-7 1/yr design speed                    193.       178.       209.

   31   80    1.071E+04 0.6612    149    141    142
Point  2.702E-01  1.633E-01  4.473E-01  7.006E-05  4.233E-05  1.160E-04
Line   2.837E+00  2.145E+00  3.752E+00  2.786E-05  2.106E-05  3.685E-05
Strike Probability, 1/yr               9.792E-05  6.340E-05  1.528E-04
1.0E-5 1/yr design speed                    119.       110.       129.
1.0E-6 1/yr design speed                    160.       151.       168.
1.0E-7 1/yr design speed                    195.       187.       204.
```

```
   31   82    1.620E+04 1.0000    348    334    337
Point  6.576E-01  4.498E-01  9.615E-01  2.633E-04  1.801E-04  3.850E-04
Line   4.584E+00  3.723E+00  5.645E+00  6.952E-05  5.646E-05  8.561E-05
Strike Probability, 1/yr                3.328E-04  2.365E-04  4.706E-04
1.0E-5 1/yr design speed                     143.       137.       150.
1.0E-6 1/yr design speed                     181.       175.       187.
1.0E-7 1/yr design speed                     213.       207.       220.

   31   84    1.620E+04 1.0000    407    368    371
Point  6.791E-01  4.977E-01  9.265E-01  3.180E-04  2.330E-04  4.339E-04
Line   5.471E+00  4.533E+00  6.603E+00  9.704E-05  8.041E-05  1.171E-04
Strike Probability, 1/yr                4.150E-04  3.135E-04  5.510E-04
1.0E-5 1/yr design speed                     148.       143.       153.
1.0E-6 1/yr design speed                     184.       179.       190.
1.0E-7 1/yr design speed                     217.       211.       223.

   31   86    1.620E+04 1.0000    327    297    297
Point  1.172E+00  7.373E-01  1.864E+00  4.410E-04  2.774E-04  7.011E-04
Line   6.910E+00  5.312E+00  8.989E+00  9.847E-05  7.570E-05  1.281E-04
Strike Probability, 1/yr                5.395E-04  3.531E-04  8.292E-04
1.0E-5 1/yr design speed                     151.       144.       158.
1.0E-6 1/yr design speed                     187.       180.       195.
1.0E-7 1/yr design speed                     220.       212.       228.

   31   88    1.620E+04 1.0000    495    438    438
Point  1.857E+00  1.324E+00  2.604E+00  1.058E-03  7.541E-04  1.483E-03
Line   9.240E+00  7.667E+00  1.114E+01  1.993E-04  1.654E-04  2.402E-04
Strike Probability, 1/yr                1.257E-03  9.195E-04  1.723E-03
1.0E-5 1/yr design speed                     164.       159.       170.
1.0E-6 1/yr design speed                     199.       193.       205.
1.0E-7 1/yr design speed                     230.       224.       238.

   31   90    1.620E+04 1.0000    592    537    537
Point  8.554E-01  6.565E-01  1.115E+00  5.826E-04  4.471E-04  7.592E-04
Line   6.714E+00  5.778E+00  7.801E+00  1.732E-04  1.491E-04  2.013E-04
Strike Probability, 1/yr                7.558E-04  5.962E-04  9.605E-04
1.0E-5 1/yr design speed                     158.       154.       162.
1.0E-6 1/yr design speed                     193.       188.       198.
1.0E-7 1/yr design speed                     225.       220.       231.

   31   92    1.620E+04 1.0000    502    479    479
Point  8.955E-01  6.552E-01  1.224E+00  5.172E-04  3.784E-04  7.070E-04
Line   7.153E+00  5.982E+00  8.553E+00  1.565E-04  1.309E-04  1.871E-04
Strike Probability, 1/yr                6.737E-04  5.092E-04  8.941E-04
1.0E-5 1/yr design speed                     156.       151.       161.
1.0E-6 1/yr design speed                     191.       186.       197.
1.0E-7 1/yr design speed                     223.       218.       230.

   31   94    1.620E+04 1.0000    557    466    469
Point  1.117E+00  7.418E-01  1.681E+00  7.155E-04  4.754E-04  1.077E-03
Line   4.765E+00  3.941E+00  5.760E+00  1.157E-04  9.567E-05  1.398E-04
Strike Probability, 1/yr                8.312E-04  5.711E-04  1.217E-03
1.0E-5 1/yr design speed                     157.       151.       164.
1.0E-6 1/yr design speed                     192.       186.       200.
1.0E-7 1/yr design speed                     225.       217.       232.
```

```
   31   96    1.620E+04 1.0000    655    562    565
Point  2.900E-01  2.061E-01  4.080E-01  2.185E-04  1.553E-04  3.075E-04
Line   2.146E+00  1.828E+00  2.519E+00  6.125E-05  5.217E-05  7.191E-05
Strike Probability, 1/yr                2.798E-04  2.075E-04  3.794E-04
1.0E-5 1/yr design speed                     141.       135.       146.
1.0E-6 1/yr design speed                     178.       173.       184.
1.0E-7 1/yr design speed                     211.       206.       217.

   31   98    1.620E+04 1.0000    490    432    434
Point  2.416E-01  1.622E-01  3.597E-01  1.362E-04  9.147E-05  2.028E-04
Line   1.894E+00  1.578E+00  2.272E+00  4.044E-05  3.370E-05  4.853E-05
Strike Probability, 1/yr                1.766E-04  1.252E-04  2.513E-04
1.0E-5 1/yr design speed                     133.       127.       139.
1.0E-6 1/yr design speed                     171.       166.       177.
1.0E-7 1/yr design speed                     205.       199.       212.

   31  100    1.620E+04 1.0000    394    366    367
Point  1.603E-01  1.133E-01  2.269E-01  7.268E-05  5.137E-05  1.028E-04
Line   1.760E+00  1.475E+00  2.099E+00  3.021E-05  2.532E-05  3.605E-05
Strike Probability, 1/yr                1.029E-04  7.669E-05  1.389E-04
1.0E-5 1/yr design speed                     124.       118.       129.
1.0E-6 1/yr design speed                     164.       159.       169.
1.0E-7 1/yr design speed                     199.       194.       204.

   31  102    1.620E+04 1.0000    303    255    255
Point  1.731E-01  1.121E-01  2.674E-01  6.034E-05  3.907E-05  9.320E-05
Line   1.825E+00  1.471E+00  2.265E+00  2.410E-05  1.942E-05  2.990E-05
Strike Probability, 1/yr                8.444E-05  5.849E-05  1.231E-04
1.0E-5 1/yr design speed                     115.       104.       127.
1.0E-6 1/yr design speed                     157.       145.       169.
1.0E-7 1/yr design speed                     195.       183.       206.

   31  104    1.579E+04 0.9749     57     41     41
Point  1.084E-01  3.180E-02  3.695E-01  7.292E-06  2.139E-06  2.485E-05
Line   1.230E+00  6.929E-01  2.184E+00  3.134E-06  1.766E-06  5.564E-06
Strike Probability, 1/yr                1.043E-05  3.905E-06  3.042E-05
1.0E-5 1/yr design speed                      66.        60.        97.
1.0E-6 1/yr design speed                     119.        97.       144.
1.0E-7 1/yr design speed                     161.       140.       183.

   31  106    1.009E+04 0.6230     23     16     16
Point  7.299E-02  2.164E-02  2.462E-01  3.100E-06  9.192E-07  1.046E-05
Line   1.483E+00  7.347E-01  2.994E+00  2.386E-06  1.182E-06  4.817E-06
Strike Probability, 1/yr                5.487E-06  2.101E-06  1.528E-05
1.0E-5 1/yr design speed                      60.        60.        80.
1.0E-6 1/yr design speed                     108.        84.       132.
1.0E-7 1/yr design speed                     151.       130.       173.

   31  108    1.294E+04 0.7989     15      8      8
Point  1.517E-01  1.161E-02  1.983E+00  3.277E-06  2.507E-07  4.283E-05
Line   1.340E+00  3.992E-01  4.498E+00  1.096E-06  3.266E-07  3.681E-06
Strike Probability, 1/yr                4.373E-06  5.773E-07  4.651E-05
1.0E-5 1/yr design speed                      60.        60.       106.
1.0E-6 1/yr design speed                     102.        60.       151.
1.0E-7 1/yr design speed                     145.       106.       189.
```

```
   31  110    1.335E+04 0.8240     34     25     25
Point  3.423E-02  1.427E-02  8.213E-02  1.625E-06  6.774E-07  3.899E-06
Line   1.487E+00  8.371E-01  2.641E+00  2.674E-06  1.505E-06  4.750E-06
Strike Probability, 1/yr                4.299E-06  2.183E-06  8.648E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                     104.        86.       122.
1.0E-7 1/yr design speed                     148.       131.       164.

   31  112    8.668E+03 0.5353      7      5      5
Point  1.215E-01  7.801E-03  1.893E+00  1.828E-06  1.174E-07  2.848E-05
Line   2.732E+00  2.905E-01  2.568E+01  1.557E-06  1.656E-07  1.464E-05
Strike Probability, 1/yr                3.385E-06  2.830E-07  4.312E-05
1.0E-5 1/yr design speed                      60.        60.       106.
1.0E-6 1/yr design speed                      98.        60.       151.
1.0E-7 1/yr design speed                     142.        91.       190.

   31  114    3.624E+03 0.2238     10      5      5
Point  1.437E-02  3.471E-03  5.946E-02  7.386E-07  1.785E-07  3.057E-06
Line   9.687E-01  4.646E-01  2.020E+00  1.887E-06  9.049E-07  3.933E-06
Strike Probability, 1/yr                2.625E-06  1.083E-06  6.990E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      93.        68.       117.
1.0E-7 1/yr design speed                     140.       120.       161.

   31  116    2.013E+03 0.1243      9      7      7
Point  2.009E-02  2.425E-03  1.665E-01  1.674E-06  2.020E-07  1.387E-05
Line   2.470E-01  1.292E-01  4.721E-01  7.792E-07  4.076E-07  1.490E-06
Strike Probability, 1/yr                2.453E-06  6.096E-07  1.536E-05
1.0E-5 1/yr design speed                      60.        60.        79.
1.0E-6 1/yr design speed                      89.        60.       130.
1.0E-7 1/yr design speed                     135.       107.       171.

   33   76    3.347E+03 0.2114    108     99     99
Point  5.317E-02  3.327E-02  8.497E-02  3.197E-05  2.001E-05  5.109E-05
Line   1.221E+00  9.279E-01  1.606E+00  2.781E-05  2.113E-05  3.659E-05
Strike Probability, 1/yr                5.978E-05  4.114E-05  8.768E-05
1.0E-5 1/yr design speed                     112.       104.       121.
1.0E-6 1/yr design speed                     154.       146.       161.
1.0E-7 1/yr design speed                     188.       181.       196.

   33   78    1.225E+04 0.7737    239    220    220
Point  7.834E-01  4.369E-01  1.405E+00  2.848E-04  1.588E-04  5.107E-04
Line   4.126E+00  3.103E+00  5.486E+00  5.682E-05  4.273E-05  7.555E-05
Strike Probability, 1/yr                3.416E-04  2.016E-04  5.862E-04
1.0E-5 1/yr design speed                     140.       130.       151.
1.0E-6 1/yr design speed                     178.       168.       189.
1.0E-7 1/yr design speed                     214.       204.       224.

   33   80    1.583E+04 1.0000    320    310    311
Point  5.015E-01  3.333E-01  7.546E-01  1.889E-04  1.255E-04  2.842E-04
Line   3.646E+00  2.934E+00  4.532E+00  5.201E-05  4.185E-05  6.465E-05
Strike Probability, 1/yr                2.409E-04  1.674E-04  3.488E-04
1.0E-5 1/yr design speed                     135.       128.       143.
1.0E-6 1/yr design speed                     173.       166.       181.
1.0E-7 1/yr design speed                     208.       201.       216.
```

```
   33   82    1.583E+04 1.0000    286    278    279
Point  9.383E-01  6.277E-01  1.403E+00  3.158E-04  2.113E-04  4.721E-04
Line   5.439E+00  4.381E+00  6.752E+00  6.934E-05  5.585E-05  8.609E-05
Strike Probability, 1/yr                3.852E-04  2.671E-04  5.582E-04
1.0E-5 1/yr design speed                     145.       139.       152.
1.0E-6 1/yr design speed                     182.       176.       189.
1.0E-7 1/yr design speed                     215.       208.       222.

   33   84    1.583E+04 1.0000    385    374    374
Point  8.942E-01  6.543E-01  1.222E+00  4.052E-04  2.965E-04  5.538E-04
Line   5.546E+00  4.685E+00  6.564E+00  9.518E-05  8.040E-05  1.127E-04
Strike Probability, 1/yr                5.003E-04  3.769E-04  6.664E-04
1.0E-5 1/yr design speed                     150.       145.       155.
1.0E-6 1/yr design speed                     186.       181.       192.
1.0E-7 1/yr design speed                     219.       213.       225.

   33   86    1.583E+04 1.0000    541    493    493
Point  1.979E+00  1.419E+00  2.761E+00  1.260E-03  9.033E-04  1.758E-03
Line   7.830E+00  6.608E+00  9.279E+00  1.888E-04  1.594E-04  2.238E-04
Strike Probability, 1/yr                1.449E-03  1.063E-03  1.981E-03
1.0E-5 1/yr design speed                     166.       160.       172.
1.0E-6 1/yr design speed                     200.       194.       207.
1.0E-7 1/yr design speed                     232.       225.       239.

   33   88    1.583E+04 1.0000    406    354    354
Point  1.807E+00  1.242E+00  2.628E+00  8.634E-04  5.936E-04  1.256E-03
Line   8.846E+00  7.307E+00  1.071E+01  1.601E-04  1.322E-04  1.938E-04
Strike Probability, 1/yr                1.023E-03  7.258E-04  1.450E-03
1.0E-5 1/yr design speed                     161.       155.       167.
1.0E-6 1/yr design speed                     196.       190.       203.
1.0E-7 1/yr design speed                     228.       221.       235.

   33   90    1.583E+04 1.0000    449    397    397
Point  1.166E+00  8.485E-01  1.602E+00  6.161E-04  4.484E-04  8.466E-04
Line   7.791E+00  6.525E+00  9.303E+00  1.559E-04  1.306E-04  1.862E-04
Strike Probability, 1/yr                7.720E-04  5.790E-04  1.033E-03
1.0E-5 1/yr design speed                     157.       153.       163.
1.0E-6 1/yr design speed                     193.       187.       199.
1.0E-7 1/yr design speed                     225.       219.       231.

   33   92    1.583E+04 1.0000    431    399    399
Point  2.004E+00  1.380E+00  2.910E+00  1.016E-03  6.999E-04  1.476E-03
Line   6.728E+00  5.611E+00  8.067E+00  1.293E-04  1.078E-04  1.550E-04
Strike Probability, 1/yr                1.146E-03  8.077E-04  1.631E-03
1.0E-5 1/yr design speed                     161.       155.       168.
1.0E-6 1/yr design speed                     196.       190.       203.
1.0E-7 1/yr design speed                     228.       221.       236.

   33   94    1.583E+04 1.0000    451    382    382
Point  1.770E+00  1.138E+00  2.753E+00  9.396E-04  6.042E-04  1.461E-03
Line   6.434E+00  5.222E+00  7.927E+00  1.294E-04  1.050E-04  1.594E-04
Strike Probability, 1/yr                1.069E-03  7.092E-04  1.621E-03
1.0E-5 1/yr design speed                     161.       154.       168.
1.0E-6 1/yr design speed                     196.       188.       203.
1.0E-7 1/yr design speed                     228.       220.       236.
```

```
   33   96    1.583E+04 1.0000    721    615    616
Point  1.077E+00  7.421E-01  1.564E+00  9.141E-04  6.297E-04  1.327E-03
Line   4.525E+00  3.797E+00  5.392E+00  1.454E-04  1.221E-04  1.733E-04
Strike Probability, 1/yr                1.060E-03  7.518E-04  1.500E-03
1.0E-5 1/yr design speed                     161.       155.       167.
1.0E-6 1/yr design speed                     196.       190.       203.
1.0E-7 1/yr design speed                     228.       221.       235.

   33   98    1.583E+04 1.0000    668    526    526
Point  8.525E-01  5.725E-01  1.269E+00  6.702E-04  4.501E-04  9.979E-04
Line   4.062E+00  3.347E+00  4.930E+00  1.210E-04  9.966E-05  1.468E-04
Strike Probability, 1/yr                7.911E-04  5.497E-04  1.145E-03
1.0E-5 1/yr design speed                     157.       151.       163.
1.0E-6 1/yr design speed                     192.       186.       199.
1.0E-7 1/yr design speed                     224.       217.       232.

   33  100    1.583E+04 1.0000    620    575    575
Point  3.035E-01  2.212E-01  4.163E-01  2.214E-04  1.614E-04  3.038E-04
Line   2.779E+00  2.363E+00  3.268E+00  7.680E-05  6.531E-05  9.031E-05
Strike Probability, 1/yr                2.982E-04  2.267E-04  3.941E-04
1.0E-5 1/yr design speed                     143.       138.       148.
1.0E-6 1/yr design speed                     180.       175.       185.
1.0E-7 1/yr design speed                     213.       208.       219.

   33  102    1.583E+04 1.0000    517    439    439
Point  2.556E-01  1.802E-01  3.624E-01  1.555E-04  1.097E-04  2.205E-04
Line   2.883E+00  2.376E+00  3.497E+00  6.644E-05  5.477E-05  8.059E-05
Strike Probability, 1/yr                2.219E-04  1.644E-04  3.011E-04
1.0E-5 1/yr design speed                     134.       123.       144.
1.0E-6 1/yr design speed                     173.       162.       184.
1.0E-7 1/yr design speed                     210.       199.       220.

   33  104    1.583E+04 1.0000     61     41     41
Point  4.018E-02  1.330E-02  1.214E-01  2.885E-06  9.548E-07  8.716E-06
Line   1.494E+00  7.215E-01  3.093E+00  4.062E-06  1.962E-06  8.411E-06
Strike Probability, 1/yr                6.947E-06  2.917E-06  1.713E-05
1.0E-5 1/yr design speed                      60.        60.        83.
1.0E-6 1/yr design speed                     113.        92.       135.
1.0E-7 1/yr design speed                     156.       136.       176.

   33  106    1.583E+04 1.0000     17      9      9
Point  4.971E-01  2.334E-02  1.059E+01  9.945E-06  4.670E-07  2.118E-04
Line   2.124E+00  6.162E-01  7.320E+00  1.609E-06  4.670E-07  5.547E-06
Strike Probability, 1/yr                1.155E-05  9.340E-07  2.173E-04
1.0E-5 1/yr design speed                      70.        60.       136.
1.0E-6 1/yr design speed                     120.        60.       177.
1.0E-7 1/yr design speed                     161.       114.       214.

   33  108    1.583E+04 1.0000      2      2      2
Point  1.723E-02  3.225E-03  9.209E-02  4.056E-08  7.590E-09  2.168E-07
Line   6.182E-01  1.859E-01  2.056E+00  5.512E-08  1.658E-08  1.833E-07
Strike Probability, 1/yr                9.568E-08  2.417E-08  4.000E-07
1.0E-5 1/yr design speed                      50.        50.        60.
1.0E-6 1/yr design speed                      50.        50.        60.
1.0E-7 1/yr design speed                      50.        50.       105.
```

```
   33  110    1.583E+04 1.0000     42     31     31
Point  3.883E-01  9.074E-02  1.662E+00  1.919E-05  4.485E-06  8.213E-05
Line   3.773E+00  2.037E+00  6.987E+00  7.064E-06  3.814E-06  1.308E-05
Strike Probability, 1/yr               2.626E-05  8.299E-06  9.522E-05
1.0E-5 1/yr design speed                     91.        60.       121.
1.0E-6 1/yr design speed                    136.       112.       163.
1.0E-7 1/yr design speed                    176.       152.       201.

   33  112    1.583E+04 1.0000     42     25     25
Point  2.293E-02  8.799E-03  5.973E-02  1.133E-06  4.349E-07  2.953E-06
Line   6.574E-01  4.154E-01  1.040E+00  1.231E-06  7.778E-07  1.948E-06
Strike Probability, 1/yr               2.364E-06  1.213E-06  4.900E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     89.        71.       109.
1.0E-7 1/yr design speed                    136.       120.       154.

   33  114    1.583E+04 1.0000     11      8      8
Point  1.940E-01  1.556E-02  2.418E+00  2.511E-06  2.014E-07  3.130E-05
Line   1.565E+00  5.217E-01  4.697E+00  7.676E-07  2.558E-07  2.303E-06
Strike Probability, 1/yr               3.279E-06  4.572E-07  3.361E-05
1.0E-5 1/yr design speed                     60.        60.        99.
1.0E-6 1/yr design speed                     96.        60.       145.
1.0E-7 1/yr design speed                    140.       101.       184.

   33  116    1.464E+04 0.9246     64     52     52
Point  3.332E-02  1.672E-02  6.641E-02  2.715E-06  1.362E-06  5.410E-06
Line   1.026E+00  6.794E-01  1.549E+00  3.165E-06  2.096E-06  4.779E-06
Strike Probability, 1/yr               5.880E-06  3.459E-06  1.019E-05
1.0E-5 1/yr design speed                     60.        60.        66.
1.0E-6 1/yr design speed                    110.        96.       125.
1.0E-7 1/yr design speed                    153.       139.       167.

   33  118    7.087E+03 0.4476     38     34     34
Point  6.213E-02  1.924E-02  2.006E-01  6.207E-06  1.922E-06  2.004E-05
Line   8.853E-01  5.131E-01  1.527E+00  3.350E-06  1.942E-06  5.780E-06
Strike Probability, 1/yr               9.557E-06  3.864E-06  2.582E-05
1.0E-5 1/yr design speed                     60.        60.        93.
1.0E-6 1/yr design speed                    118.        97.       141.
1.0E-7 1/yr design speed                    160.       140.       181.

   33  120    1.180E+03 0.0746      2      2      2
Point  3.513E-04  1.056E-04  1.168E-03  1.109E-08  3.335E-09  3.687E-08
Line   1.000E-01  0.000E+00  0.000E+00  1.196E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr               1.307E-07  3.335E-09  3.687E-08
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                     60.        50.        50.
1.0E-7 1/yr design speed                     76.        50.        50.

   35   74    7.725E+02 0.0500     44     39     39
Point  5.988E-02  2.472E-02  1.451E-01  6.355E-05  2.623E-05  1.540E-04
Line   8.342E-01  5.466E-01  1.273E+00  3.354E-05  2.197E-05  5.119E-05
Strike Probability, 1/yr               9.709E-05  4.821E-05  2.052E-04
1.0E-5 1/yr design speed                    120.       106.       134.
1.0E-6 1/yr design speed                    160.       148.       173.
1.0E-7 1/yr design speed                    195.       183.       208.
```

```
   35   76    1.429E+04 0.9248    303    273    273
Point  6.670E-01  4.258E-01  1.045E+00  2.635E-04  1.682E-04  4.128E-04
Line   4.888E+00  3.833E+00  6.233E+00  7.315E-05  5.736E-05  9.329E-05
Strike Probability, 1/yr                3.367E-04  2.256E-04  5.061E-04
1.0E-5 1/yr design speed                     141.       133.       149.
1.0E-6 1/yr design speed                     179.       171.       187.
1.0E-7 1/yr design speed                     213.       205.       222.

   35   78    1.545E+04 1.0000    210    183    186
Point  1.017E+00  5.500E-01  1.879E+00  2.574E-04  1.393E-04  4.758E-04
Line   5.197E+00  3.847E+00  7.020E+00  4.985E-05  3.690E-05  6.735E-05
Strike Probability, 1/yr                3.073E-04  1.762E-04  5.431E-04
1.0E-5 1/yr design speed                     138.       128.       150.
1.0E-6 1/yr design speed                     177.       166.       187.
1.0E-7 1/yr design speed                     212.       202.       223.

   35   80    1.545E+04 1.0000    221    188    189
Point  1.193E+00  6.578E-01  2.162E+00  3.178E-04  1.753E-04  5.762E-04
Line   5.636E+00  4.183E+00  7.594E+00  5.690E-05  4.223E-05  7.666E-05
Strike Probability, 1/yr                3.747E-04  2.175E-04  6.529E-04
1.0E-5 1/yr design speed                     142.       131.       153.
1.0E-6 1/yr design speed                     180.       169.       190.
1.0E-7 1/yr design speed                     215.       205.       226.

   35   82    1.545E+04 1.0000     87     78     78
Point  4.630E-01  2.416E-01  8.874E-01  4.858E-05  2.535E-05  9.311E-05
Line   4.758E+00  3.235E+00  6.998E+00  1.891E-05  1.286E-05  2.781E-05
Strike Probability, 1/yr                6.749E-05  3.820E-05  1.209E-04
1.0E-5 1/yr design speed                     115.       104.       126.
1.0E-6 1/yr design speed                     157.       148.       166.
1.0E-7 1/yr design speed                     192.       184.       202.

   35   84    1.545E+04 1.0000    226    221    221
Point  2.113E+00  1.259E+00  3.547E+00  5.759E-04  3.431E-04  9.668E-04
Line   7.094E+00  5.640E+00  8.923E+00  7.324E-05  5.822E-05  9.213E-05
Strike Probability, 1/yr                6.492E-04  4.013E-04  1.059E-03
1.0E-5 1/yr design speed                     152.       144.       161.
1.0E-6 1/yr design speed                     188.       180.       197.
1.0E-7 1/yr design speed                     221.       212.       230.

   35   86    1.545E+04 1.0000    355    333    333
Point  4.434E+00  2.456E+00  8.007E+00  1.899E-03  1.052E-03  3.428E-03
Line   6.703E+00  5.264E+00  8.535E+00  1.087E-04  8.536E-05  1.384E-04
Strike Probability, 1/yr                2.007E-03  1.137E-03  3.566E-03
1.0E-5 1/yr design speed                     169.       159.       179.
1.0E-6 1/yr design speed                     203.       193.       213.
1.0E-7 1/yr design speed                     235.       224.       246.

   35   88    1.545E+04 1.0000    425    408    408
Point  1.672E+00  1.062E+00  2.633E+00  8.571E-04  5.443E-04  1.350E-03
Line   6.366E+00  5.128E+00  7.902E+00  1.236E-04  9.956E-05  1.534E-04
Strike Probability, 1/yr                9.807E-04  6.439E-04  1.503E-03
1.0E-5 1/yr design speed                     159.       152.       167.
1.0E-6 1/yr design speed                     194.       187.       202.
1.0E-7 1/yr design speed                     227.       219.       235.
```

```
   35   90    1.545E+04 1.0000    507    481    481
Point  2.162E+00  1.498E+00  3.121E+00  1.322E-03  9.157E-04  1.909E-03
Line   7.123E+00  6.032E+00  8.410E+00  1.650E-04  1.397E-04  1.948E-04
Strike Probability, 1/yr                1.487E-03  1.055E-03  2.103E-03
1.0E-5 1/yr design speed                     165.       160.       172.
1.0E-6 1/yr design speed                     200.       194.       207.
1.0E-7 1/yr design speed                     232.       225.       240.

   35   92    1.545E+04 1.0000    388    368    368
Point  1.945E+00  1.336E+00  2.831E+00  9.100E-04  6.250E-04  1.325E-03
Line   7.629E+00  6.308E+00  9.227E+00  1.352E-04  1.118E-04  1.635E-04
Strike Probability, 1/yr                1.045E-03  7.369E-04  1.488E-03
1.0E-5 1/yr design speed                     160.       155.       167.
1.0E-6 1/yr design speed                     195.       189.       202.
1.0E-7 1/yr design speed                     227.       220.       235.

   35   94    1.545E+04 1.0000    670    571    571
Point  9.520E-01  6.855E-01  1.322E+00  7.693E-04  5.539E-04  1.068E-03
Line   4.995E+00  4.200E+00  5.941E+00  1.529E-04  1.285E-04  1.818E-04
Strike Probability, 1/yr                9.221E-04  6.825E-04  1.250E-03
1.0E-5 1/yr design speed                     159.       154.       165.
1.0E-6 1/yr design speed                     194.       189.       201.
1.0E-7 1/yr design speed                     227.       220.       233.

   35   96    1.545E+04 1.0000    942    745    745
Point  2.381E+00  1.706E+00  3.321E+00  2.704E-03  1.939E-03  3.773E-03
Line   7.032E+00  5.991E+00  8.253E+00  3.026E-04  2.578E-04  3.552E-04
Strike Probability, 1/yr                3.007E-03  2.196E-03  4.128E-03
1.0E-5 1/yr design speed                     176.       170.       182.
1.0E-6 1/yr design speed                     210.       203.       217.
1.0E-7 1/yr design speed                     241.       234.       249.

   35   98    1.545E+04 1.0000    658    479    479
Point  1.623E+00  1.058E+00  2.492E+00  1.288E-03  8.394E-04  1.977E-03
Line   5.706E+00  4.626E+00  7.040E+00  1.715E-04  1.390E-04  2.116E-04
Strike Probability, 1/yr                1.460E-03  9.784E-04  2.189E-03
1.0E-5 1/yr design speed                     165.       159.       173.
1.0E-6 1/yr design speed                     200.       193.       208.
1.0E-7 1/yr design speed                     232.       224.       240.

   35  100    1.545E+04 1.0000    617    537    537
Point  6.134E-01  4.266E-01  8.820E-01  4.564E-04  3.174E-04  6.563E-04
Line   2.753E+00  2.338E+00  3.241E+00  7.759E-05  6.591E-05  9.134E-05
Strike Probability, 1/yr                5.340E-04  3.833E-04  7.477E-04
1.0E-5 1/yr design speed                     150.       144.       156.
1.0E-6 1/yr design speed                     186.       180.       192.
1.0E-7 1/yr design speed                     219.       212.       226.

   35  102    1.545E+04 1.0000    207    156    156
Point  3.236E-01  1.838E-01  5.699E-01  8.079E-05  4.587E-05  1.423E-04
Line   3.459E+00  2.503E+00  4.780E+00  3.271E-05  2.367E-05  4.520E-05
Strike Probability, 1/yr                1.135E-04  6.954E-05  1.875E-04
1.0E-5 1/yr design speed                     121.       108.       135.
1.0E-6 1/yr design speed                     162.       148.       176.
1.0E-7 1/yr design speed                     199.       185.       212.
```

```
   35  104    1.545E+04 1.0000     41     28     28
Point  5.335E-02  1.795E-02  1.585E-01  2.638E-06  8.878E-07  7.837E-06
Line   1.839E+00  8.250E-01  4.099E+00  3.444E-06  1.545E-06  7.676E-06
Strike Probability, 1/yr                6.082E-06  2.433E-06  1.551E-05
1.0E-5 1/yr design speed                      60.        60.        81.
1.0E-6 1/yr design speed                     110.        88.       133.
1.0E-7 1/yr design speed                     153.       133.       174.

   35  106    1.545E+04 1.0000     27     15     15
Point  6.812E-02  1.529E-02  3.035E-01  2.218E-06  4.979E-07  9.882E-06
Line   1.411E+00  6.084E-01  3.272E+00  1.740E-06  7.504E-07  4.036E-06
Strike Probability, 1/yr                3.958E-06  1.248E-06  1.392E-05
1.0E-5 1/yr design speed                      60.        60.        77.
1.0E-6 1/yr design speed                     101.        72.       130.
1.0E-7 1/yr design speed                     145.       121.       171.

   35  108    1.545E+04 1.0000      7      5      5
Point  2.353E-02  1.633E-03  3.391E-01  1.986E-07  1.379E-08  2.862E-06
Line   4.761E-01  1.312E-01  1.728E+00  1.522E-07  4.195E-08  5.525E-07
Strike Probability, 1/yr                3.509E-07  5.574E-08  3.415E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.       100.
1.0E-7 1/yr design speed                      98.        50.       146.

   35  110    1.545E+04 1.0000     15     10     10
Point  6.986E-02  9.238E-03  5.283E-01  1.264E-06  1.671E-07  9.556E-06
Line   1.332E+00  3.653E-01  4.856E+00  9.126E-07  2.503E-07  3.327E-06
Strike Probability, 1/yr                2.176E-06  4.174E-07  1.288E-05
1.0E-5 1/yr design speed                      60.        60.        75.
1.0E-6 1/yr design speed                      87.        60.       128.
1.0E-7 1/yr design speed                     134.       100.       169.

   35  112    1.545E+04 1.0000     18     15     15
Point  1.678E-01  2.811E-02  1.002E+00  3.644E-06  6.102E-07  2.176E-05
Line   2.516E+00  8.773E-01  7.213E+00  2.068E-06  7.214E-07  5.931E-06
Strike Probability, 1/yr                5.712E-06  1.332E-06  2.769E-05
1.0E-5 1/yr design speed                      60.        60.        95.
1.0E-6 1/yr design speed                     108.        74.       142.
1.0E-7 1/yr design speed                     151.       121.       182.

   35  114    1.545E+04 1.0000     18     15     15
Point  9.965E-02  1.696E-02  5.856E-01  2.163E-06  3.681E-07  1.271E-05
Line   8.427E-01  4.347E-01  1.634E+00  6.929E-07  3.574E-07  1.343E-06
Strike Probability, 1/yr                2.856E-06  7.255E-07  1.405E-05
1.0E-5 1/yr design speed                      60.        60.        77.
1.0E-6 1/yr design speed                      92.        60.       129.
1.0E-7 1/yr design speed                     138.       109.       170.

   35  116    1.545E+04 1.0000      4      4      4
Point  8.533E-04  6.345E-04  1.147E-03  4.116E-09  3.061E-09  5.535E-09
Line   1.502E-01  1.117E-01  2.020E-01  2.744E-08  2.041E-08  3.690E-08
Strike Probability, 1/yr                3.156E-08  2.347E-08  4.244E-08
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.
```

```
   35  118    1.545E+04 1.0000     40     40     40
Point  2.274E-02  1.009E-02  5.126E-02  1.097E-06  4.866E-07  2.473E-06
Line   9.560E-01  6.059E-01  1.509E+00  1.747E-06  1.107E-06  2.757E-06
Strike Probability, 1/yr               2.844E-06  1.594E-06  5.229E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     94.        78.       111.
1.0E-7 1/yr design speed                    140.       126.       156.

   35  120    1.118E+04 0.7239     16     15     15
Point  3.436E-02  9.602E-03  1.230E-01  9.160E-07  2.559E-07  3.278E-06
Line   1.099E+00  5.034E-01  2.398E+00  1.109E-06  5.083E-07  2.421E-06
Strike Probability, 1/yr               2.025E-06  7.643E-07  5.699E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     86.        60.       112.
1.0E-7 1/yr design speed                    134.       112.       156.

   35  122    1.919E+02 0.0124      1      1      1
Point  5.682E-02  0.000E+00  0.000E+00  5.517E-06  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  3.678E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr               9.195E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     60.         0.         0.
1.0E-6 1/yr design speed                    118.         0.         0.
1.0E-7 1/yr design speed                    159.         0.         0.

   37   74    3.928E+03 0.2611     64     59     59
Point  1.839E-01  8.133E-02  4.156E-01  5.581E-05  2.469E-05  1.262E-04
Line   2.712E+00  1.672E+00  4.398E+00  3.118E-05  1.923E-05  5.056E-05
Strike Probability, 1/yr               8.699E-05  4.392E-05  1.767E-04
1.0E-5 1/yr design speed                    118.       104.       132.
1.0E-6 1/yr design speed                    158.       147.       171.
1.0E-7 1/yr design speed                    194.       182.       206.

   37   76    1.429E+04 0.9497    232    204    204
Point  4.061E-01  2.627E-01  6.277E-01  1.228E-04  7.946E-05  1.899E-04
Line   3.217E+00  2.579E+00  4.013E+00  3.686E-05  2.955E-05  4.598E-05
Strike Probability, 1/yr               1.597E-04  1.090E-04  2.358E-04
1.0E-5 1/yr design speed                    128.       120.       136.
1.0E-6 1/yr design speed                    167.       159.       175.
1.0E-7 1/yr design speed                    202.       194.       210.

   37   78    1.505E+04 1.0000     98     86     86
Point  2.646E-01  1.348E-01  5.194E-01  3.210E-05  1.635E-05  6.302E-05
Line   2.589E+00  1.817E+00  3.690E+00  1.190E-05  8.349E-06  1.696E-05
Strike Probability, 1/yr               4.400E-05  2.470E-05  7.998E-05
1.0E-5 1/yr design speed                    106.        93.       117.
1.0E-6 1/yr design speed                    150.       140.       159.
1.0E-7 1/yr design speed                    186.       178.       195.

   37   80    1.505E+04 1.0000     45     34     34
Point  1.728E-01  8.645E-02  3.453E-01  9.626E-06  4.817E-06  1.924E-05
Line   3.244E+00  1.940E+00  5.426E+00  6.847E-06  4.094E-06  1.145E-05
Strike Probability, 1/yr               1.647E-05  8.910E-06  3.069E-05
1.0E-5 1/yr design speed                     83.        60.       100.
1.0E-6 1/yr design speed                    135.       124.       146.
1.0E-7 1/yr design speed                    174.       164.       184.
```

```
   37   82    1.505E+04 1.0000    119    112    112
Point  7.110E-01  3.707E-01  1.364E+00  1.048E-04  5.462E-05  2.009E-04
Line   4.916E+00  3.480E+00  6.945E+00  2.744E-05  1.942E-05  3.876E-05
Strike Probability, 1/yr                1.322E-04  7.404E-05  2.397E-04
1.0E-5 1/yr design speed                     127.       116.       137.
1.0E-6 1/yr design speed                     166.       157.       176.
1.0E-7 1/yr design speed                     201.       192.       210.

   37   84    1.505E+04 1.0000    340    306    306
Point  8.577E-01  5.953E-01  1.236E+00  3.611E-04  2.506E-04  5.202E-04
Line   6.537E+00  5.320E+00  8.031E+00  1.042E-04  8.484E-05  1.281E-04
Strike Probability, 1/yr                4.653E-04  3.354E-04  6.483E-04
1.0E-5 1/yr design speed                     150.       144.       155.
1.0E-6 1/yr design speed                     186.       180.       192.
1.0E-7 1/yr design speed                     218.       212.       225.

   37   86    1.505E+04 1.0000    330    282    282
Point  1.157E+00  7.370E-01  1.815E+00  4.726E-04  3.011E-04  7.417E-04
Line   6.150E+00  4.887E+00  7.738E+00  9.518E-05  7.564E-05  1.198E-04
Strike Probability, 1/yr                5.678E-04  3.768E-04  8.614E-04
1.0E-5 1/yr design speed                     152.       145.       159.
1.0E-6 1/yr design speed                     187.       181.       195.
1.0E-7 1/yr design speed                     220.       213.       228.

   37   88    1.505E+04 1.0000    435    383    384
Point  9.627E-01  6.702E-01  1.383E+00  5.185E-04  3.610E-04  7.447E-04
Line   6.405E+00  5.269E+00  7.787E+00  1.307E-04  1.075E-04  1.589E-04
Strike Probability, 1/yr                6.492E-04  4.685E-04  9.036E-04
1.0E-5 1/yr design speed                     155.       149.       160.
1.0E-6 1/yr design speed                     190.       185.       196.
1.0E-7 1/yr design speed                     222.       216.       229.

   37   90    1.505E+04 1.0000    334    316    316
Point  5.780E-01  3.994E-01  8.365E-01  2.390E-04  1.652E-04  3.459E-04
Line   4.745E+00  3.845E+00  5.857E+00  7.433E-05  6.023E-05  9.175E-05
Strike Probability, 1/yr                3.134E-04  2.254E-04  4.377E-04
1.0E-5 1/yr design speed                     143.       137.       149.
1.0E-6 1/yr design speed                     180.       175.       186.
1.0E-7 1/yr design speed                     213.       207.       220.

   37   92    1.505E+04 1.0000    389    376    376
Point  5.078E-01  3.538E-01  7.287E-01  2.446E-04  1.704E-04  3.510E-04
Line   4.028E+00  3.314E+00  4.896E+00  7.349E-05  6.046E-05  8.932E-05
Strike Probability, 1/yr                3.181E-04  2.309E-04  4.403E-04
1.0E-5 1/yr design speed                     143.       138.       149.
1.0E-6 1/yr design speed                     180.       175.       186.
1.0E-7 1/yr design speed                     213.       207.       220.

   37   94    1.505E+04 1.0000    526    442    442
Point  1.589E+00  1.052E+00  2.400E+00  1.035E-03  6.849E-04  1.563E-03
Line   5.803E+00  4.768E+00  7.063E+00  1.432E-04  1.176E-04  1.742E-04
Strike Probability, 1/yr                1.178E-03  8.025E-04  1.738E-03
1.0E-5 1/yr design speed                     162.       156.       169.
1.0E-6 1/yr design speed                     197.       190.       204.
1.0E-7 1/yr design speed                     229.       222.       237.
```

```
   37   96    1.505E+04 1.0000    626    478    478
Point  1.749E+00  1.165E+00  2.628E+00  1.356E-03  9.026E-04  2.037E-03
Line   6.937E+00  5.655E+00  8.510E+00  2.037E-04  1.660E-04  2.498E-04
Strike Probability, 1/yr               1.559E-03  1.069E-03  2.286E-03
1.0E-5 1/yr design speed                    167.       160.       174.
1.0E-6 1/yr design speed                    201.       194.       209.
1.0E-7 1/yr design speed                    233.       225.       241.

   37   98    1.505E+04 1.0000    579    438    438
Point  8.020E-01  5.732E-01  1.122E+00  5.750E-04  4.109E-04  8.045E-04
Line   5.601E+00  4.656E+00  6.738E+00  1.521E-04  1.264E-04  1.830E-04
Strike Probability, 1/yr               7.271E-04  5.373E-04  9.875E-04
1.0E-5 1/yr design speed                    157.       152.       162.
1.0E-6 1/yr design speed                    192.       187.       198.
1.0E-7 1/yr design speed                    224.       218.       231.

   37  100    1.505E+04 1.0000    419    326    326
Point  6.292E-01  4.011E-01  9.870E-01  3.264E-04  2.081E-04  5.120E-04
Line   5.445E+00  4.227E+00  7.015E+00  1.070E-04  8.307E-05  1.378E-04
Strike Probability, 1/yr               4.334E-04  2.911E-04  6.499E-04
1.0E-5 1/yr design speed                    149.       142.       156.
1.0E-6 1/yr design speed                    185.       179.       192.
1.0E-7 1/yr design speed                    218.       211.       225.

   37  102    1.505E+04 1.0000    255    208    208
Point  1.671E-01  1.052E-01  2.654E-01  5.275E-05  3.321E-05  8.380E-05
Line   2.028E+00  1.556E+00  2.643E+00  2.426E-05  1.861E-05  3.161E-05
Strike Probability, 1/yr               7.701E-05  5.182E-05  1.154E-04
1.0E-5 1/yr design speed                    114.       102.       126.
1.0E-6 1/yr design speed                    156.       144.       168.
1.0E-7 1/yr design speed                    193.       181.       205.

   37  104    1.505E+04 1.0000    103     85     85
Point  3.271E-02  1.978E-02  5.409E-02  4.172E-06  2.523E-06  6.898E-06
Line   7.642E-01  5.747E-01  1.016E+00  3.692E-06  2.776E-06  4.909E-06
Strike Probability, 1/yr               7.864E-06  5.299E-06  1.181E-05
1.0E-5 1/yr design speed                     60.        60.        72.
1.0E-6 1/yr design speed                    115.       104.       127.
1.0E-7 1/yr design speed                    157.       145.       169.

   37  106    1.505E+04 1.0000     13     12     13
Point  1.089E+00  4.808E-02  2.468E+01  1.753E-05  7.738E-07  3.972E-04
Line   2.666E+00  8.151E-01  8.719E+00  1.625E-06  4.969E-07  5.316E-06
Strike Probability, 1/yr               1.916E-05  1.271E-06  4.025E-04
1.0E-5 1/yr design speed                     82.        60.       147.
1.0E-6 1/yr design speed                    129.        72.       187.
1.0E-7 1/yr design speed                    169.       119.       223.

   37  108    1.505E+04 1.0000      8      7      7
Point  5.572E-02  1.857E-02  1.672E-01  5.519E-07  1.839E-07  1.656E-06
Line   1.714E+00  7.158E-01  4.106E+00  6.432E-07  2.686E-07  1.540E-06
Strike Probability, 1/yr               1.195E-06  4.525E-07  3.196E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     71.        60.       100.
1.0E-7 1/yr design speed                    124.       101.       147.
```

```
   37  110    1.505E+04 1.0000     12      7      7
Point  1.343E-02  2.417E-03  7.460E-02  1.995E-07  3.591E-08  1.108E-06
Line   4.758E-01  2.121E-01  1.067E+00  2.678E-07  1.194E-07  6.006E-07
Strike Probability, 1/yr               4.673E-07  1.553E-07  1.709E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        83.
1.0E-7 1/yr design speed                    105.        78.       134.

   37  112    1.505E+04 1.0000     14     13     13
Point  4.776E-02  8.773E-03  2.600E-01  8.279E-07  1.521E-07  4.507E-06
Line   1.065E+00  4.355E-01  2.604E+00  6.993E-07  2.860E-07  1.710E-06
Strike Probability, 1/yr               1.527E-06  4.380E-07  6.217E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     78.        60.       113.
1.0E-7 1/yr design speed                    128.       101.       157.

   37  114    1.505E+04 1.0000      6      4      5
Point  2.237E-02  1.683E-03  2.972E-01  1.662E-07  1.250E-08  2.208E-06
Line   1.263E+00  2.871E-01  5.560E+00  3.555E-07  8.079E-08  1.564E-06
Strike Probability, 1/yr               5.217E-07  9.330E-08  3.773E-06
1.0E-5 1/yr design speed                     60.        50.        60.
1.0E-6 1/yr design speed                     60.        50.       103.
1.0E-7 1/yr design speed                    108.        50.       149.

   37  116    1.505E+04 1.0000      3      3      3
Point  6.515E-04  2.650E-04  1.602E-03  2.420E-09  9.842E-10  5.951E-09
Line   1.329E-01  9.626E-02  1.835E-01  1.870E-08  1.354E-08  2.582E-08
Strike Probability, 1/yr               2.112E-08  1.453E-08  3.177E-08
1.0E-5 1/yr design speed                     50.        50.        50.
1.0E-6 1/yr design speed                     50.        50.        50.
1.0E-7 1/yr design speed                     50.        50.        50.

   37  118    1.505E+04 1.0000      3      2      2
Point  1.599E-02  5.352E-03  4.778E-02  5.940E-08  1.988E-08  1.775E-07
Line   7.509E-01  4.901E-01  1.150E+00  1.056E-07  6.895E-08  1.619E-07
Strike Probability, 1/yr               1.650E-07  8.884E-08  3.393E-07
1.0E-5 1/yr design speed                     60.        50.        60.
1.0E-6 1/yr design speed                     60.        50.        60.
1.0E-7 1/yr design speed                     81.        50.       101.

   37  120    1.505E+04 1.0000     50     41     41
Point  2.740E-02  1.346E-02  5.576E-02  1.696E-06  8.332E-07  3.452E-06
Line   7.005E-01  4.858E-01  1.010E+00  1.643E-06  1.139E-06  2.369E-06
Strike Probability, 1/yr               3.339E-06  1.972E-06  5.821E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     97.        83.       112.
1.0E-7 1/yr design speed                    142.       129.       157.

   37  122    6.367E+03 0.4231     24     23     23
Point  7.819E-02  2.947E-02  2.075E-01  5.491E-06  2.069E-06  1.457E-05
Line   1.900E+00  9.714E-01  3.718E+00  5.056E-06  2.584E-06  9.891E-06
Strike Probability, 1/yr               1.055E-05  4.654E-06  2.446E-05
1.0E-5 1/yr design speed                     67.        60.        93.
1.0E-6 1/yr design speed                    121.       101.       141.
1.0E-7 1/yr design speed                    162.       143.       181.
```

```
   39   70    1.815E+02 0.0124      0      0      0

   39   72    1.999E+03 0.1367     25     22     22
Point  4.298E-02  2.111E-02  8.751E-02  1.001E-05  4.917E-06  2.039E-05
Line   1.086E+00  6.158E-01  1.917E+00  9.587E-06  5.434E-06  1.691E-05
Strike Probability, 1/yr                1.960E-05  1.035E-05  3.730E-05
1.0E-5 1/yr design speed                      86.        66.       103.
1.0E-6 1/yr design speed                     135.       123.       147.
1.0E-7 1/yr design speed                     172.       161.       183.

   39   74    1.316E+04 0.8993    266    248    248
Point  3.006E-01  2.064E-01  4.376E-01  1.132E-04  7.777E-05  1.649E-04
Line   2.691E+00  2.214E+00  3.272E+00  3.840E-05  3.159E-05  4.669E-05
Strike Probability, 1/yr                1.516E-04  1.094E-04  2.116E-04
1.0E-5 1/yr design speed                     127.       120.       134.
1.0E-6 1/yr design speed                     166.       159.       173.
1.0E-7 1/yr design speed                     202.       195.       208.

   39   76    1.463E+04 1.0000    260    229    229
Point  2.576E-01  1.778E-01  3.730E-01  8.529E-05  5.889E-05  1.235E-04
Line   2.467E+00  2.045E+00  2.976E+00  3.095E-05  2.565E-05  3.733E-05
Strike Probability, 1/yr                1.162E-04  8.455E-05  1.609E-04
1.0E-5 1/yr design speed                     123.       115.       130.
1.0E-6 1/yr design speed                     162.       156.       169.
1.0E-7 1/yr design speed                     198.       191.       204.

   39   78    1.463E+04 1.0000    175    146    146
Point  5.861E-01  3.653E-01  9.403E-01  1.306E-04  8.142E-05  2.096E-04
Line   4.480E+00  3.489E+00  5.751E+00  3.782E-05  2.946E-05  4.856E-05
Strike Probability, 1/yr                1.685E-04  1.109E-04  2.582E-04
1.0E-5 1/yr design speed                     132.       125.       139.
1.0E-6 1/yr design speed                     170.       164.       178.
1.0E-7 1/yr design speed                     204.       198.       212.

   39   80    1.463E+04 1.0000    170    139    139
Point  3.835E-01  2.303E-01  6.387E-01  8.303E-05  4.985E-05  1.383E-04
Line   3.159E+00  2.433E+00  4.103E+00  2.591E-05  1.996E-05  3.365E-05
Strike Probability, 1/yr                1.089E-04  6.981E-05  1.719E-04
1.0E-5 1/yr design speed                     124.       116.       132.
1.0E-6 1/yr design speed                     164.       157.       171.
1.0E-7 1/yr design speed                     199.       191.       206.

   39   82    1.463E+04 1.0000    300    249    249
Point  1.144E+00  7.231E-01  1.811E+00  4.373E-04  2.763E-04  6.919E-04
Line   6.071E+00  4.720E+00  7.808E+00  8.786E-05  6.831E-05  1.130E-04
Strike Probability, 1/yr                5.251E-04  3.446E-04  8.050E-04
1.0E-5 1/yr design speed                     150.       143.       158.
1.0E-6 1/yr design speed                     186.       179.       194.
1.0E-7 1/yr design speed                     219.       211.       227.

   39   84    1.463E+04 1.0000    502    393    394
Point  1.579E+00  1.023E+00  2.437E+00  1.010E-03  6.542E-04  1.558E-03
Line   6.024E+00  4.876E+00  7.442E+00  1.459E-04  1.181E-04  1.802E-04
Strike Probability, 1/yr                1.155E-03  7.723E-04  1.738E-03
1.0E-5 1/yr design speed                     162.       155.       169.
1.0E-6 1/yr design speed                     197.       190.       204.
1.0E-7 1/yr design speed                     229.       221.       237.
```

```
   39   86    1.463E+04 1.0000    480    362    362
Point  1.376E+00  8.467E-01  2.237E+00  8.414E-04  5.176E-04  1.368E-03
Line   5.769E+00  4.537E+00  7.336E+00  1.336E-04  1.051E-04  1.699E-04
Strike Probability, 1/yr                9.750E-04  6.227E-04  1.537E-03
1.0E-5 1/yr design speed                     159.       152.       167.
1.0E-6 1/yr design speed                     195.       187.       203.
1.0E-7 1/yr design speed                     227.       219.       236.

   39   88    1.463E+04 1.0000    613    505    505
Point  1.260E+00  8.159E-01  1.947E+00  9.840E-04  6.370E-04  1.520E-03
Line   6.094E+00  4.887E+00  7.599E+00  1.802E-04  1.445E-04  2.247E-04
Strike Probability, 1/yr                1.164E-03  7.815E-04  1.745E-03
1.0E-5 1/yr design speed                     163.       156.       170.
1.0E-6 1/yr design speed                     198.       191.       205.
1.0E-7 1/yr design speed                     229.       222.       238.

   39   90    1.463E+04 1.0000    384    330    330
Point  2.572E+00  1.470E+00  4.503E+00  1.258E-03  7.187E-04  2.202E-03
Line   9.030E+00  6.862E+00  1.188E+01  1.673E-04  1.271E-04  2.202E-04
Strike Probability, 1/yr                1.425E-03  8.458E-04  2.422E-03
1.0E-5 1/yr design speed                     165.       157.       174.
1.0E-6 1/yr design speed                     200.       191.       209.
1.0E-7 1/yr design speed                     231.       222.       242.

   39   92    1.463E+04 1.0000    311    290    290
Point  1.893E+00  1.075E+00  3.335E+00  7.500E-04  4.258E-04  1.321E-03
Line   7.413E+00  5.673E+00  9.686E+00  1.112E-04  8.512E-05  1.453E-04
Strike Probability, 1/yr                8.612E-04  5.109E-04  1.466E-03
1.0E-5 1/yr design speed                     157.       149.       166.
1.0E-6 1/yr design speed                     193.       184.       202.
1.0E-7 1/yr design speed                     225.       216.       235.

   39   94    1.463E+04 1.0000    561    479    483
Point  2.183E+00  1.424E+00  3.348E+00  1.560E-03  1.018E-03  2.392E-03
Line   7.216E+00  5.877E+00  8.859E+00  1.953E-04  1.591E-04  2.398E-04
Strike Probability, 1/yr                1.755E-03  1.177E-03  2.632E-03
1.0E-5 1/yr design speed                     168.       161.       176.
1.0E-6 1/yr design speed                     202.       195.       210.
1.0E-7 1/yr design speed                     234.       226.       243.

   39   96    1.463E+04 1.0000    556    464    464
Point  1.395E+00  9.289E-01  2.096E+00  9.882E-04  6.578E-04  1.484E-03
Line   8.788E+00  6.974E+00  1.107E+01  2.357E-04  1.871E-04  2.970E-04
Strike Probability, 1/yr                1.224E-03  8.449E-04  1.781E-03
1.0E-5 1/yr design speed                     165.       158.       171.
1.0E-6 1/yr design speed                     199.       193.       206.
1.0E-7 1/yr design speed                     231.       224.       238.

   39   98    1.463E+04 1.0000    642    536    536
Point  7.745E-01  5.430E-01  1.105E+00  6.333E-04  4.440E-04  9.032E-04
Line   5.457E+00  4.503E+00  6.612E+00  1.690E-04  1.395E-04  2.048E-04
Strike Probability, 1/yr                8.023E-04  5.835E-04  1.108E-03
1.0E-5 1/yr design speed                     158.       153.       164.
1.0E-6 1/yr design speed                     193.       188.       200.
1.0E-7 1/yr design speed                     225.       219.       232.
```

```
   39  100    1.463E+04 1.0000    438    338    338
Point  3.229E-01  2.118E-01  4.922E-01  1.801E-04  1.182E-04  2.746E-04
Line   3.004E+00  2.388E+00  3.779E+00  6.348E-05  5.046E-05  7.986E-05
Strike Probability, 1/yr               2.436E-04  1.686E-04  3.544E-04
1.0E-5 1/yr design speed                    139.       133.       146.
1.0E-6 1/yr design speed                    177.       171.       183.
1.0E-7 1/yr design speed                    210.       204.       217.

   39  102    1.463E+04 1.0000    472    379    379
Point  5.305E-02  3.990E-02  7.056E-02  3.189E-05  2.398E-05  4.242E-05
Line   9.546E-01  8.080E-01  1.128E+00  2.174E-05  1.840E-05  2.568E-05
Strike Probability, 1/yr               5.363E-05  4.238E-05  6.810E-05
1.0E-5 1/yr design speed                    107.        99.       116.
1.0E-6 1/yr design speed                    150.       141.       159.
1.0E-7 1/yr design speed                    188.       179.       197.

   39  104    1.463E+04 1.0000    571    513    513
Point  3.792E-02  3.053E-02  4.711E-02  2.758E-05  2.220E-05  3.426E-05
Line   7.940E-01  7.020E-01  8.980E-01  2.187E-05  1.934E-05  2.474E-05
Strike Probability, 1/yr               4.945E-05  4.154E-05  5.900E-05
1.0E-5 1/yr design speed                    106.        99.       113.
1.0E-6 1/yr design speed                    149.       141.       157.
1.0E-7 1/yr design speed                    187.       179.       195.

   39  106    1.463E+04 1.0000      8      7      7
Point  9.276E-03  4.367E-03  1.970E-02  9.451E-08  4.449E-08  2.008E-07
Line   3.413E-01  2.139E-01  5.445E-01  1.317E-07  8.255E-08  2.101E-07
Strike Probability, 1/yr               2.262E-07  1.270E-07  4.109E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     88.        73.       106.

   39  108    1.463E+04 1.0000     12     10     11
Point  1.821E-02  5.737E-03  5.777E-02  2.783E-07  8.768E-08  8.830E-07
Line   7.024E-01  3.131E-01  1.576E+00  4.067E-07  1.813E-07  9.122E-07
Strike Probability, 1/yr               6.849E-07  2.690E-07  1.795E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        85.
1.0E-7 1/yr design speed                    113.        90.       136.

   39  110    1.463E+04 1.0000     32     23     23
Point  1.935E-01  3.120E-02  1.200E+00  7.887E-06  1.272E-06  4.892E-05
Line   1.455E+00  6.888E-01  3.074E+00  2.247E-06  1.063E-06  4.746E-06
Strike Probability, 1/yr               1.013E-05  2.335E-06  5.366E-05
1.0E-5 1/yr design speed                     65.        60.       109.
1.0E-6 1/yr design speed                    118.        86.       153.
1.0E-7 1/yr design speed                    160.       131.       192.

   39  112    1.463E+04 1.0000     14     11     11
Point  2.833E-02  4.266E-03  1.881E-01  5.051E-07  7.607E-08  3.354E-06
Line   5.852E-01  2.391E-01  1.432E+00  3.952E-07  1.615E-07  9.671E-07
Strike Probability, 1/yr               9.004E-07  2.376E-07  4.321E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.       105.
1.0E-7 1/yr design speed                    118.        87.       150.
```

```
   39  114    1.463E+04 1.0000     14      9     11
Point  2.346E-01  7.259E-03  7.584E+00  4.184E-06  1.294E-07  1.352E-04
Line   9.030E-01  3.114E-01  2.619E+00  6.099E-07  2.103E-07  1.769E-06
Strike Probability, 1/yr                4.794E-06  3.397E-07  1.370E-04
1.0E-5 1/yr design speed                      60.        60.       128.
1.0E-6 1/yr design speed                     103.        60.       169.
1.0E-7 1/yr design speed                     146.        95.       206.

   39  116    1.463E+04 1.0000      4      3      3
Point  1.324E-02  1.390E-03  1.261E-01  6.745E-08  7.079E-09  6.426E-07
Line   5.866E-01  1.778E-01  1.935E+00  1.132E-07  3.431E-08  3.734E-07
Strike Probability, 1/yr                1.806E-07  4.139E-08  1.016E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.        66.
1.0E-7 1/yr design speed                      83.        50.       124.

   39  118    1.463E+04 1.0000     16     11     11
Point  9.851E-02  1.374E-02  7.062E-01  2.007E-06  2.800E-07  1.439E-05
Line   3.051E+00  7.569E-01  1.230E+01  2.355E-06  5.843E-07  9.493E-06
Strike Probability, 1/yr                4.363E-06  8.643E-07  2.388E-05
1.0E-5 1/yr design speed                      60.        60.        92.
1.0E-6 1/yr design speed                     104.        60.       140.
1.0E-7 1/yr design speed                     148.       114.       181.

   39  120    1.463E+04 1.0000      9      7      7
Point  7.839E-02  6.570E-03  9.354E-01  8.986E-07  7.531E-08  1.072E-05
Line   1.886E+00  4.181E-01  8.503E+00  8.187E-07  1.816E-07  3.692E-06
Strike Probability, 1/yr                1.717E-06  2.569E-07  1.441E-05
1.0E-5 1/yr design speed                      60.        60.        78.
1.0E-6 1/yr design speed                      81.        60.       130.
1.0E-7 1/yr design speed                     130.        89.       171.

   39  122    1.426E+04 0.9748     10      6      7
Point  4.207E-01  1.261E-02  1.403E+01  5.497E-06  1.648E-07  1.834E-04
Line   1.447E+00  4.920E-01  4.255E+00  7.161E-07  2.435E-07  2.106E-06
Strike Probability, 1/yr                6.213E-06  4.083E-07  1.855E-04
1.0E-5 1/yr design speed                      60.        60.       133.
1.0E-6 1/yr design speed                     108.        60.       174.
1.0E-7 1/yr design speed                     151.        99.       211.

   39  124    9.103E+02 0.0622      1      1      1
Point  2.273E-01  0.000E+00  0.000E+00  4.652E-06  0.000E+00  0.000E+00
Line   2.000E+00  0.000E+00  0.000E+00  1.551E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                6.203E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.         0.         0.
1.0E-6 1/yr design speed                     109.         0.         0.
1.0E-7 1/yr design speed                     152.         0.         0.

   41   68    1.788E+02 0.0126      0      0      0

   41   70    6.012E+03 0.4236    113    106    106
Point  2.840E-01  1.434E-01  5.625E-01  9.945E-05  5.020E-05  1.970E-04
Line   2.790E+00  1.911E+00  4.074E+00  3.701E-05  2.535E-05  5.404E-05
Strike Probability, 1/yr                1.365E-04  7.555E-05  2.510E-04
1.0E-5 1/yr design speed                     126.       114.       137.
1.0E-6 1/yr design speed                     165.       154.       176.
1.0E-7 1/yr design speed                     200.       189.       211.
```

```
   41   72    1.312E+04 0.9244    227    203    203
Point  3.331E-01  2.110E-01  5.258E-01  1.074E-04  6.804E-05  1.695E-04
Line   3.264E+00  2.538E+00  4.197E+00  3.985E-05  3.099E-05  5.125E-05
Strike Probability, 1/yr                1.472E-04  9.903E-05  2.208E-04
1.0E-5 1/yr design speed                     127.       119.       135.
1.0E-6 1/yr design speed                     166.       158.       174.
1.0E-7 1/yr design speed                     201.       193.       209.

   41   74    1.419E+04 1.0000    119    111    111
Point  8.583E-01  4.199E-01  1.755E+00  1.341E-04  6.560E-05  2.741E-04
Line   3.118E+00  2.273E+00  4.279E+00  1.845E-05  1.345E-05  2.532E-05
Strike Probability, 1/yr                1.526E-04  7.905E-05  2.994E-04
1.0E-5 1/yr design speed                     125.       112.       138.
1.0E-6 1/yr design speed                     165.       153.       178.
1.0E-7 1/yr design speed                     202.       189.       214.

   41   76    1.419E+04 1.0000    115    109    109
Point  1.537E+00  7.621E-01  3.100E+00  2.321E-04  1.151E-04  4.680E-04
Line   4.103E+00  3.105E+00  5.422E+00  2.346E-05  1.776E-05  3.101E-05
Strike Probability, 1/yr                2.555E-04  1.328E-04  4.990E-04
1.0E-5 1/yr design speed                     134.       121.       147.
1.0E-6 1/yr design speed                     173.       161.       186.
1.0E-7 1/yr design speed                     209.       197.       222.

   41   78    1.173E+04 0.8264    122    108    108
Point  3.642E+00  1.518E+00  8.737E+00  7.059E-04  2.943E-04  1.693E-03
Line   7.106E+00  4.952E+00  1.020E+01  5.217E-05  3.636E-05  7.487E-05
Strike Probability, 1/yr                7.581E-04  3.306E-04  1.768E-03
1.0E-5 1/yr design speed                     154.       140.       168.
1.0E-6 1/yr design speed                     189.       176.       203.
1.0E-7 1/yr design speed                     222.       209.       237.

   41   80    5.540E+03 0.3903    153    127    127
Point  9.497E-01  5.168E-01  1.745E+00  4.887E-04  2.659E-04  8.982E-04
Line   5.383E+00  3.946E+00  7.343E+00  1.049E-04  7.691E-05  1.431E-04
Strike Probability, 1/yr                5.936E-04  3.428E-04  1.041E-03
1.0E-5 1/yr design speed                     153.       144.       162.
1.0E-6 1/yr design speed                     188.       180.       198.
1.0E-7 1/yr design speed                     221.       212.       231.

   41   82    9.225E+03 0.6500    305    264    264
Point  6.720E-01  4.235E-01  1.066E+00  4.140E-04  2.609E-04  6.569E-04
Line   5.271E+00  4.052E+00  6.856E+00  1.230E-04  9.455E-05  1.600E-04
Strike Probability, 1/yr                5.370E-04  3.554E-04  8.169E-04
1.0E-5 1/yr design speed                     152.       145.       159.
1.0E-6 1/yr design speed                     188.       181.       195.
1.0E-7 1/yr design speed                     220.       213.       228.

   41   84    1.419E+04 1.0000    435    354    354
Point  1.864E+00  1.153E+00  3.013E+00  1.064E-03  6.584E-04  1.721E-03
Line   6.909E+00  5.523E+00  8.641E+00  1.495E-04  1.195E-04  1.869E-04
Strike Probability, 1/yr                1.214E-03  7.778E-04  1.908E-03
1.0E-5 1/yr design speed                     163.       155.       171.
1.0E-6 1/yr design speed                     197.       190.       206.
1.0E-7 1/yr design speed                     229.       221.       238.
```

```
   41   86    7.839E+03 0.5524    320    238    238
Point  1.281E+00  7.730E-01  2.124E+00  9.746E-04  5.879E-04  1.616E-03
Line   6.445E+00  5.020E+00  8.273E+00  1.857E-04  1.446E-04  2.384E-04
Strike Probability, 1/yr                1.160E-03  7.326E-04  1.854E-03
1.0E-5 1/yr design speed                     163.       156.       171.
1.0E-6 1/yr design speed                     198.       190.       206.
1.0E-7 1/yr design speed                     229.       221.       239.

   41   88    1.419E+04 1.0000    407    344    345
Point  7.856E-01  5.124E-01  1.205E+00  4.198E-04  2.738E-04  6.437E-04
Line   5.989E+00  4.739E+00  7.570E+00  1.212E-04  9.592E-05  1.532E-04
Strike Probability, 1/yr                5.410E-04  3.697E-04  7.969E-04
1.0E-5 1/yr design speed                     152.       146.       159.
1.0E-6 1/yr design speed                     188.       182.       195.
1.0E-7 1/yr design speed                     220.       214.       228.

   41   90    1.419E+04 1.0000    518    442    444
Point  2.249E+00  1.376E+00  3.678E+00  1.530E-03  9.355E-04  2.501E-03
Line   7.516E+00  5.965E+00  9.469E+00  1.936E-04  1.537E-04  2.439E-04
Strike Probability, 1/yr                1.723E-03  1.089E-03  2.745E-03
1.0E-5 1/yr design speed                     168.       160.       176.
1.0E-6 1/yr design speed                     202.       194.       211.
1.0E-7 1/yr design speed                     234.       225.       243.

   41   92    1.419E+04 1.0000    565    488    488
Point  1.286E+00  8.572E-01  1.929E+00  9.539E-04  6.358E-04  1.431E-03
Line   6.210E+00  5.065E+00  7.615E+00  1.745E-04  1.423E-04  2.140E-04
Strike Probability, 1/yr                1.128E-03  7.782E-04  1.645E-03
1.0E-5 1/yr design speed                     162.       156.       169.
1.0E-6 1/yr design speed                     197.       191.       204.
1.0E-7 1/yr design speed                     229.       222.       237.

   41   94    1.419E+04 1.0000    427    373    373
Point  1.087E+00  6.966E-01  1.697E+00  6.095E-04  3.905E-04  9.515E-04
Line   5.881E+00  4.669E+00  7.408E+00  1.249E-04  9.915E-05  1.573E-04
Strike Probability, 1/yr                7.344E-04  4.896E-04  1.109E-03
1.0E-5 1/yr design speed                     156.       149.       163.
1.0E-6 1/yr design speed                     191.       185.       199.
1.0E-7 1/yr design speed                     224.       216.       232.

   41   96    1.419E+04 1.0000    562    451    451
Point  9.520E-01  6.254E-01  1.449E+00  7.025E-04  4.614E-04  1.069E-03
Line   6.005E+00  4.756E+00  7.583E+00  1.678E-04  1.329E-04  2.119E-04
Strike Probability, 1/yr                8.703E-04  5.944E-04  1.281E-03
1.0E-5 1/yr design speed                     159.       153.       166.
1.0E-6 1/yr design speed                     194.       188.       201.
1.0E-7 1/yr design speed                     226.       219.       234.

   41   98    1.419E+04 1.0000    407    335    335
Point  7.830E-01  4.823E-01  1.271E+00  4.184E-04  2.577E-04  6.792E-04
Line   7.469E+00  5.607E+00  9.950E+00  1.512E-04  1.135E-04  2.014E-04
Strike Probability, 1/yr                5.696E-04  3.712E-04  8.806E-04
1.0E-5 1/yr design speed                     154.       147.       161.
1.0E-6 1/yr design speed                     190.       183.       197.
1.0E-7 1/yr design speed                     222.       215.       230.
```

```
   41  100    1.419E+04 1.0000    208    165    165
Point  4.774E-01  2.410E-01  9.456E-01  1.304E-04  6.582E-05  2.582E-04
Line   5.249E+00  3.474E+00  7.930E+00  5.429E-05  3.593E-05  8.203E-05
Strike Probability, 1/yr                1.847E-04  1.017E-04  3.403E-04
1.0E-5 1/yr design speed                     135.       125.       145.
1.0E-6 1/yr design speed                     174.       164.       183.
1.0E-7 1/yr design speed                     207.       198.       217.

   41  102    1.419E+04 1.0000    346    267    267
Point  1.474E-01  9.276E-02  2.344E-01  6.698E-05  4.214E-05  1.065E-04
Line   2.697E+00  2.009E+00  3.622E+00  4.641E-05  3.457E-05  6.232E-05
Strike Probability, 1/yr                1.134E-04  7.671E-05  1.688E-04
1.0E-5 1/yr design speed                     122.       110.       134.
1.0E-6 1/yr design speed                     163.       151.       175.
1.0E-7 1/yr design speed                     200.       188.       211.

   41  104    1.419E+04 1.0000    243    190    190
Point  5.632E-02  3.585E-02  8.848E-02  1.797E-05  1.144E-05  2.823E-05
Line   1.219E+00  9.568E-01  1.554E+00  1.474E-05  1.156E-05  1.878E-05
Strike Probability, 1/yr                3.270E-05  2.300E-05  4.701E-05
1.0E-5 1/yr design speed                      97.        86.       108.
1.0E-6 1/yr design speed                     142.       131.       153.
1.0E-7 1/yr design speed                     181.       169.       192.

   41  106    1.419E+04 1.0000     37     29     29
Point  2.455E-01  5.388E-02  1.118E+00  1.192E-05  2.617E-06  5.432E-05
Line   1.367E+00  8.402E-01  2.225E+00  2.516E-06  1.546E-06  4.094E-06
Strike Probability, 1/yr                1.444E-05  4.163E-06  5.842E-05
1.0E-5 1/yr design speed                      76.        60.       111.
1.0E-6 1/yr design speed                     125.        98.       155.
1.0E-7 1/yr design speed                     165.       140.       193.

   41  108    1.419E+04 1.0000     20     18     18
Point  2.385E-02  8.849E-03  6.430E-02  6.264E-07  2.324E-07  1.688E-06
Line   4.623E-01  3.045E-01  7.020E-01  4.598E-07  3.028E-07  6.982E-07
Strike Probability, 1/yr                1.086E-06  5.352E-07  2.387E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      68.        60.        91.
1.0E-7 1/yr design speed                     121.       104.       140.

   41  110    1.419E+04 1.0000     25     22     22
Point  2.741E-02  1.080E-02  6.956E-02  8.995E-07  3.544E-07  2.283E-06
Line   7.319E-01  4.348E-01  1.232E+00  9.099E-07  5.405E-07  1.532E-06
Strike Probability, 1/yr                1.809E-06  8.949E-07  3.815E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      83.        60.       103.
1.0E-7 1/yr design speed                     131.       114.       149.

   41  112    1.419E+04 1.0000     46     38     39
Point  5.796E-02  2.372E-02  1.416E-01  3.500E-06  1.433E-06  8.551E-06
Line   1.159E+00  7.158E-01  1.877E+00  2.652E-06  1.638E-06  4.294E-06
Strike Probability, 1/yr                6.152E-06  3.070E-06  1.284E-05
1.0E-5 1/yr design speed                      60.        60.        75.
1.0E-6 1/yr design speed                     110.        92.       128.
1.0E-7 1/yr design speed                     153.       136.       170.
```

```
   41  114    1.419E+04 1.0000     23     19     19
Point  2.339E-02  7.696E-03  7.111E-02  7.064E-07  2.324E-07  2.147E-06
Line   7.995E-01  4.351E-01  1.469E+00  9.144E-07  4.977E-07  1.680E-06
Strike Probability, 1/yr                1.621E-06  7.300E-07  3.827E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      80.        60.       104.
1.0E-7 1/yr design speed                     130.       111.       150.

   41  116    1.419E+04 1.0000      2      2      2
Point  3.486E-03  4.523E-04  2.687E-02  9.153E-09  1.188E-09  7.055E-08
Line   6.135E-01  7.960E-02  4.729E+00  6.102E-08  7.917E-09  4.703E-07
Strike Probability, 1/yr                7.017E-08  9.105E-09  5.409E-07
1.0E-5 1/yr design speed                      50.        50.        60.
1.0E-6 1/yr design speed                      50.        50.        60.
1.0E-7 1/yr design speed                      50.        50.       113.

   41  118    1.419E+04 1.0000      3      2      2
Point  1.136E-03  0.000E+00  0.000E+00  4.476E-09  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  2.984E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                3.431E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.         0.         0.
1.0E-6 1/yr design speed                      50.         0.         0.
1.0E-7 1/yr design speed                      50.         0.         0.

   41  120    1.419E+04 1.0000      3      3      3
Point  4.676E-02  1.034E-03  2.115E+00  1.842E-07  4.072E-09  8.329E-06
Line   1.269E+00  1.782E-01  9.029E+00  1.893E-07  2.659E-08  1.347E-06
Strike Probability, 1/yr                3.734E-07  3.066E-08  9.676E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.       122.
1.0E-7 1/yr design speed                     100.        50.       164.

   41  122    1.419E+04 1.0000      0      0      0

   41  124    1.414E+03 0.0996      8      6      7
Point  6.181E-03  2.697E-03  1.417E-02  6.517E-07  2.843E-07  1.494E-06
Line   3.132E-01  1.878E-01  5.225E-01  1.251E-06  7.501E-07  2.087E-06
Strike Probability, 1/yr                1.903E-06  1.034E-06  3.581E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      84.        66.       103.
1.0E-7 1/yr design speed                     133.       118.       149.

   43   66    1.873E+03 0.1363      2      2      2
Point  2.484E-01  1.333E-01  4.629E-01  4.942E-06  2.651E-06  9.211E-06
Line   1.402E+01  8.718E+00  2.256E+01  1.057E-05  6.570E-06  1.700E-05
Strike Probability, 1/yr                1.551E-05  9.222E-06  2.621E-05
1.0E-5 1/yr design speed                      82.        60.        97.
1.0E-6 1/yr design speed                     133.       123.       143.
1.0E-7 1/yr design speed                     170.       161.       179.

   43   68    6.135E+03 0.4466     24     23     23
Point  1.430E-01  6.147E-02  3.326E-01  1.042E-05  4.480E-06  2.424E-05
Line   3.152E+00  1.720E+00  5.775E+00  8.702E-06  4.749E-06  1.594E-05
Strike Probability, 1/yr                1.912E-05  9.229E-06  4.018E-05
1.0E-5 1/yr design speed                      85.        60.       104.
1.0E-6 1/yr design speed                     134.       120.       148.
1.0E-7 1/yr design speed                     172.       159.       184.
```

```
   43   70    1.270E+04 0.9244     72     67     67
Point  9.533E-02  5.169E-02  1.758E-01  1.007E-05  5.460E-06  1.858E-05
Line   1.614E+00  1.124E+00  2.318E+00  6.459E-06  4.497E-06  9.276E-06
Strike Probability, 1/yr               1.653E-05  9.958E-06  2.785E-05
1.0E-5 1/yr design speed                     81.        60.        95.
1.0E-6 1/yr design speed                    131.       121.       141.
1.0E-7 1/yr design speed                    169.       160.       178.

   43   72    1.374E+04 1.0000     54     46     46
Point  3.185E-01  1.242E-01  8.165E-01  2.333E-05  9.098E-06  5.981E-05
Line   3.408E+00  2.005E+00  5.792E+00  9.455E-06  5.564E-06  1.607E-05
Strike Probability, 1/yr               3.278E-05  1.466E-05  7.587E-05
1.0E-5 1/yr design speed                     97.        77.       115.
1.0E-6 1/yr design speed                    141.       127.       156.
1.0E-7 1/yr design speed                    179.       165.       193.

   43   74    1.272E+04 0.9256     37     33     33
Point  4.611E-01  1.222E-01  1.740E+00  2.500E-05  6.625E-06  9.436E-05
Line   2.490E+00  1.395E+00  4.446E+00  5.114E-06  2.864E-06  9.130E-06
Strike Probability, 1/yr               3.012E-05  9.489E-06  1.035E-04
1.0E-5 1/yr design speed                     93.        60.       119.
1.0E-6 1/yr design speed                    138.       118.       160.
1.0E-7 1/yr design speed                    176.       157.       197.

   43   76    2.248E+03 0.1637     22     19     19
Point  6.696E-01  1.793E-01  2.501E+00  1.221E-04  3.268E-05  4.561E-04
Line   7.180E+00  3.663E+00  1.407E+01  4.959E-05  2.530E-05  9.720E-05
Strike Probability, 1/yr               1.717E-04  5.798E-05  5.533E-04
1.0E-5 1/yr design speed                    130.       110.       151.
1.0E-6 1/yr design speed                    169.       151.       188.
1.0E-7 1/yr design speed                    203.       186.       223.

   43   78    1.212E+03 0.0882      5      4      4
Point  2.861E-01  3.570E-02  2.294E+00  2.199E-05  2.743E-06  1.763E-04
Line   4.042E+00  1.348E+00  1.212E+01  1.177E-05  3.924E-06  3.529E-05
Strike Probability, 1/yr               3.376E-05  6.668E-06  2.116E-04
1.0E-5 1/yr design speed                    101.        60.       135.
1.0E-6 1/yr design speed                    147.       120.       174.
1.0E-7 1/yr design speed                    184.       162.       209.

   43   82    7.056E+03 0.5137    141    127    127
Point  8.968E-01  4.347E-01  1.850E+00  3.339E-04  1.618E-04  6.889E-04
Line   4.390E+00  3.120E+00  6.178E+00  6.191E-05  4.400E-05  8.713E-05
Strike Probability, 1/yr               3.958E-04  2.058E-04  7.761E-04
1.0E-5 1/yr design speed                    145.       134.       156.
1.0E-6 1/yr design speed                    182.       172.       193.
1.0E-7 1/yr design speed                    215.       205.       226.

   43   84    1.340E+04 0.9752    208    185    185
Point  6.797E-01  3.854E-01  1.199E+00  1.966E-04  1.115E-04  3.468E-04
Line   6.168E+00  4.446E+00  8.557E+00  6.759E-05  4.872E-05  9.376E-05
Strike Probability, 1/yr               2.642E-04  1.602E-04  4.405E-04
1.0E-5 1/yr design speed                    140.       132.       149.
1.0E-6 1/yr design speed                    178.       170.       186.
1.0E-7 1/yr design speed                    211.       203.       220.
```

```
   43   86    4.121E+03 0.3000     70     51     51
Point  1.156E+00  3.802E-01  3.515E+00  3.658E-04  1.203E-04  1.112E-03
Line   5.385E+00  2.986E+00  9.711E+00  6.455E-05  3.579E-05  1.164E-04
Strike Probability, 1/yr                4.304E-04  1.561E-04  1.229E-03
1.0E-5 1/yr design speed                     146.       130.       163.
1.0E-6 1/yr design speed                     183.       168.       199.
1.0E-7 1/yr design speed                     216.       202.       232.

   43   88    1.374E+04 1.0000    385    350    350
Point  8.589E-01  5.701E-01  1.294E+00  4.485E-04  2.977E-04  6.757E-04
Line   6.689E+00  5.260E+00  8.506E+00  1.323E-04  1.040E-04  1.682E-04
Strike Probability, 1/yr                5.808E-04  4.018E-04  8.439E-04
1.0E-5 1/yr design speed                     153.       147.       160.
1.0E-6 1/yr design speed                     189.       183.       196.
1.0E-7 1/yr design speed                     221.       215.       229.

   43   90    1.374E+04 1.0000    254    229    229
Point  1.402E+00  8.674E-01  2.265E+00  4.829E-04  2.988E-04  7.803E-04
Line   8.534E+00  6.535E+00  1.114E+01  1.114E-04  8.528E-05  1.454E-04
Strike Probability, 1/yr                5.943E-04  3.841E-04  9.258E-04
1.0E-5 1/yr design speed                     153.       146.       160.
1.0E-6 1/yr design speed                     189.       182.       196.
1.0E-7 1/yr design speed                     221.       213.       229.

   43   92    1.374E+04 1.0000    455    416    416
Point  1.058E+00  6.875E-01  1.627E+00  6.526E-04  4.243E-04  1.004E-03
Line   5.281E+00  4.217E+00  6.613E+00  1.234E-04  9.857E-05  1.546E-04
Strike Probability, 1/yr                7.761E-04  5.229E-04  1.158E-03
1.0E-5 1/yr design speed                     156.       150.       163.
1.0E-6 1/yr design speed                     192.       185.       199.
1.0E-7 1/yr design speed                     224.       217.       232.

   43   94    1.374E+04 1.0000    393    351    351
Point  9.954E-01  6.246E-01  1.586E+00  5.306E-04  3.329E-04  8.455E-04
Line   5.619E+00  4.373E+00  7.220E+00  1.135E-04  8.829E-05  1.458E-04
Strike Probability, 1/yr                6.440E-04  4.212E-04  9.913E-04
1.0E-5 1/yr design speed                     154.       147.       161.
1.0E-6 1/yr design speed                     189.       183.       197.
1.0E-7 1/yr design speed                     222.       214.       230.

   43   96    1.374E+04 1.0000    473    346    346
Point  4.351E-01  2.844E-01  6.657E-01  2.792E-04  1.825E-04  4.271E-04
Line   3.693E+00  2.904E+00  4.696E+00  8.974E-05  7.058E-05  1.141E-04
Strike Probability, 1/yr                3.689E-04  2.531E-04  5.412E-04
1.0E-5 1/yr design speed                     146.       140.       153.
1.0E-6 1/yr design speed                     183.       177.       189.
1.0E-7 1/yr design speed                     215.       209.       223.

   43   98    1.374E+04 1.0000    272    176    176
Point  7.101E-01  3.363E-01  1.499E+00  2.620E-04  1.241E-04  5.532E-04
Line   3.236E+00  2.281E+00  4.590E+00  4.522E-05  3.187E-05  6.415E-05
Strike Probability, 1/yr                3.072E-04  1.559E-04  6.173E-04
1.0E-5 1/yr design speed                     140.       129.       152.
1.0E-6 1/yr design speed                     178.       168.       189.
1.0E-7 1/yr design speed                     211.       201.       223.
```

```
   43  100    1.374E+04 1.0000    162    100    101
Point  3.895E-01  1.325E-01  1.145E+00  8.558E-05  2.912E-05  2.515E-04
Line   2.279E+00  1.472E+00  3.530E+00  1.897E-05  1.225E-05  2.938E-05
Strike Probability, 1/yr                1.046E-04  4.137E-05  2.809E-04
1.0E-5 1/yr design speed                     122.       105.       138.
1.0E-6 1/yr design speed                     162.       149.       177.
1.0E-7 1/yr design speed                     197.       184.       211.

   43  102    1.374E+04 1.0000    140     87     89
Point  5.446E-01  1.895E-01  1.565E+00  1.034E-04  3.598E-05  2.972E-04
Line   2.730E+00  1.735E+00  4.296E+00  1.964E-05  1.248E-05  3.090E-05
Strike Probability, 1/yr                1.230E-04  4.846E-05  3.281E-04
1.0E-5 1/yr design speed                     122.       100.       144.
1.0E-6 1/yr design speed                     162.       141.       184.
1.0E-7 1/yr design speed                     200.       179.       220.

   43  104    1.374E+04 1.0000    149    119    120
Point  3.179E-01  1.566E-01  6.454E-01  6.424E-05  3.164E-05  1.304E-04
Line   3.182E+00  2.251E+00  4.499E+00  2.436E-05  1.723E-05  3.444E-05
Strike Probability, 1/yr                8.860E-05  4.887E-05  1.649E-04
1.0E-5 1/yr design speed                     116.       101.       132.
1.0E-6 1/yr design speed                     158.       142.       173.
1.0E-7 1/yr design speed                     195.       180.       210.

   43  106    1.374E+04 1.0000     50     34     34
Point  1.157E-01  4.039E-02  3.317E-01  7.849E-06  2.739E-06  2.249E-05
Line   1.727E+00  9.477E-01  3.148E+00  4.437E-06  2.434E-06  8.086E-06
Strike Probability, 1/yr                1.229E-05  5.173E-06  3.058E-05
1.0E-5 1/yr design speed                      72.        60.        98.
1.0E-6 1/yr design speed                     123.       103.       144.
1.0E-7 1/yr design speed                     164.       145.       184.

   43  108    1.374E+04 1.0000     35     28     28
Point  1.485E-01  4.535E-02  4.860E-01  7.047E-06  2.153E-06  2.307E-05
Line   1.511E+00  9.002E-01  2.535E+00  2.717E-06  1.619E-06  4.559E-06
Strike Probability, 1/yr                9.764E-06  3.771E-06  2.763E-05
1.0E-5 1/yr design speed                      60.        60.        94.
1.0E-6 1/yr design speed                     118.        96.       142.
1.0E-7 1/yr design speed                     159.       139.       182.

   43  110    1.374E+04 1.0000     20     17     17
Point  2.151E-01  2.279E-02  2.031E+00  5.835E-06  6.181E-07  5.508E-05
Line   1.966E+00  7.935E-01  4.873E+00  2.021E-06  8.154E-07  5.008E-06
Strike Probability, 1/yr                7.856E-06  1.433E-06  6.009E-05
1.0E-5 1/yr design speed                      60.        60.       111.
1.0E-6 1/yr design speed                     114.        76.       155.
1.0E-7 1/yr design speed                     156.       123.       194.

   43  112    1.374E+04 1.0000     31     26     27
Point  3.307E-01  7.420E-02  1.474E+00  1.391E-05  3.120E-06  6.197E-05
Line   2.646E+00  1.313E+00  5.331E+00  4.214E-06  2.092E-06  8.491E-06
Strike Probability, 1/yr                1.812E-05  5.212E-06  7.046E-05
1.0E-5 1/yr design speed                      82.        60.       115.
1.0E-6 1/yr design speed                     129.       103.       158.
1.0E-7 1/yr design speed                     169.       144.       196.
```

```
   43  114    1.374E+04 1.0000      9      8      8
Point  1.364E-02  3.572E-03  5.209E-02  1.665E-07  4.360E-08  6.358E-07
Line   7.796E-01  3.169E-01  1.918E+00  3.605E-07  1.465E-07  8.869E-07
Strike Probability, 1/yr               5.270E-07  1.901E-07  1.523E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        80.
1.0E-7 1/yr design speed                    108.        83.       133.

   43  116    1.374E+04 1.0000     37     33     33
Point  3.562E-02  1.425E-02  8.909E-02  1.788E-06  7.149E-07  4.471E-06
Line   1.372E+00  7.572E-01  2.486E+00  2.608E-06  1.439E-06  4.725E-06
Strike Probability, 1/yr               4.396E-06  2.154E-06  9.196E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                    104.        85.       123.
1.0E-7 1/yr design speed                    148.       131.       165.

   43  118    1.374E+04 1.0000      4      4      4
Point  1.262E-02  2.222E-03  7.170E-02  6.848E-08  1.206E-08  3.890E-07
Line   2.490E-01  1.482E-01  4.184E-01  5.118E-08  3.046E-08  8.599E-08
Strike Probability, 1/yr               1.197E-07  4.251E-08  4.750E-07
1.0E-5 1/yr design speed                     60.        50.        60.
1.0E-6 1/yr design speed                     60.        50.        60.
1.0E-7 1/yr design speed                     71.        50.       107.

   43  120    1.374E+04 1.0000      6      6      6
Point  4.622E-02  5.117E-03  4.174E-01  3.761E-07  4.164E-08  3.397E-06
Line   1.061E+00  3.566E-01  3.157E+00  3.270E-07  1.099E-07  9.730E-07
Strike Probability, 1/yr               7.031E-07  1.516E-07  4.370E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.       105.
1.0E-7 1/yr design speed                    113.        77.       151.

   43  122    1.374E+04 1.0000     14     12     12
Point  1.662E-02  7.137E-03  3.870E-02  3.156E-07  1.355E-07  7.348E-07
Line   8.373E-01  4.693E-01  1.494E+00  6.022E-07  3.376E-07  1.074E-06
Strike Probability, 1/yr               9.178E-07  4.731E-07  1.809E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        85.
1.0E-7 1/yr design speed                    119.       103.       136.

   43  124    1.033E+03 0.0752      2      2      2
Point  1.440E-03  1.224E-04  1.694E-02  5.193E-08  4.415E-09  6.109E-07
Line   1.000E-01  0.000E+00  0.000E+00  1.366E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr               1.886E-07  4.415E-09  6.109E-07
1.0E-5 1/yr design speed                     60.        50.        60.
1.0E-6 1/yr design speed                     60.        50.        60.
1.0E-7 1/yr design speed                     84.        50.       111.

   45   66    1.996E+03 0.1505      7      7      7
Point  3.058E-01  3.219E-02  2.906E+00  1.998E-05  2.103E-06  1.899E-04
Line   4.646E+00  1.107E+00  1.949E+01  1.150E-05  2.741E-06  4.824E-05
Strike Probability, 1/yr               3.148E-05  4.844E-06  2.381E-04
1.0E-5 1/yr design speed                     97.        60.       136.
1.0E-6 1/yr design speed                    142.       108.       175.
1.0E-7 1/yr design speed                    179.       150.       210.
```

```
   45   68    1.327E+04 1.0000     22     19     19
Point  2.299E-01  5.891E-02  8.972E-01  7.104E-06  1.820E-06  2.772E-05
Line   5.077E+00  1.853E+00  1.391E+01  5.943E-06  2.169E-06  1.628E-05
Strike Probability, 1/yr               1.305E-05  3.989E-06  4.401E-05
1.0E-5 1/yr design speed                     75.        60.       106.
1.0E-6 1/yr design speed                    127.       104.       149.
1.0E-7 1/yr design speed                    166.       146.       185.

   45   70    3.006E+03 0.2266      3      2      2
Point  3.580E-03  3.386E-03  3.784E-03  6.657E-08  6.297E-08  7.036E-08
Line   2.500E-01  1.966E-01  3.181E-01  1.761E-07  1.385E-07  2.240E-07
Strike Probability, 1/yr               2.427E-07  2.014E-07  2.944E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     95.        88.       102.

   45   72    6.693E+01 0.0050      1      1      1
Point  8.523E-01  0.000E+00  0.000E+00  2.373E-04  0.000E+00  0.000E+00
Line   3.000E+00  0.000E+00  0.000E+00  3.164E-05  0.000E+00  0.000E+00
Strike Probability, 1/yr               2.689E-04  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                    135.         0.         0.
1.0E-6 1/yr design speed                    174.         0.         0.
1.0E-7 1/yr design speed                    210.         0.         0.

   45   74    3.380E+03 0.2548      0      0      0

   45   76    3.346E+03 0.2523      0      0      0

   45   82    8.336E+02 0.0628     13     10     10
Point  7.608E-01  3.587E-02  1.614E+01  2.211E-04  1.042E-05  4.689E-03
Line   4.342E+00  9.913E-01  1.902E+01  4.779E-05  1.091E-05  2.094E-04
Strike Probability, 1/yr               2.689E-04  2.133E-05  4.899E-03
1.0E-5 1/yr design speed                    136.        88.       185.
1.0E-6 1/yr design speed                    175.       135.       222.
1.0E-7 1/yr design speed                    210.       172.       257.

   45   84    5.964E+03 0.4495     33     29     29
Point  2.874E-01  8.724E-02  9.471E-01  2.964E-05  8.995E-06  9.765E-05
Line   3.335E+00  1.764E+00  6.308E+00  1.303E-05  6.887E-06  2.464E-05
Strike Probability, 1/yr               4.266E-05  1.588E-05  1.223E-04
1.0E-5 1/yr design speed                    103.        80.       124.
1.0E-6 1/yr design speed                    146.       129.       164.
1.0E-7 1/yr design speed                    183.       167.       200.

   45   86    6.944E+03 0.5234     47     43     43
Point  1.596E+00  4.412E-01  5.770E+00  2.012E-04  5.565E-05  7.277E-04
Line   7.074E+00  3.690E+00  1.356E+01  3.379E-05  1.763E-05  6.477E-05
Strike Probability, 1/yr               2.350E-04  7.328E-05  7.925E-04
1.0E-5 1/yr design speed                    133.       112.       155.
1.0E-6 1/yr design speed                    172.       153.       193.
1.0E-7 1/yr design speed                    208.       188.       229.
```

```
   45   88    1.261E+04 0.9505     87     76     76
Point  2.047E+00  7.561E-01  5.540E+00  2.631E-04  9.721E-05  7.122E-04
Line   9.156E+00  5.374E+00  1.560E+01  4.459E-05  2.617E-05  7.598E-05
Strike Probability, 1/yr                3.077E-04  1.234E-04  7.882E-04
1.0E-5 1/yr design speed                     138.       121.       156.
1.0E-6 1/yr design speed                     177.       161.       193.
1.0E-7 1/yr design speed                     212.       196.       229.

   45   90    1.162E+04 0.8761    110    103    103
Point  2.255E+00  1.029E+00  4.945E+00  3.977E-04  1.814E-04  8.720E-04
Line   8.135E+00  5.457E+00  1.213E+01  5.434E-05  3.645E-05  8.101E-05
Strike Probability, 1/yr                4.521E-04  2.178E-04  9.530E-04
1.0E-5 1/yr design speed                     146.       134.       159.
1.0E-6 1/yr design speed                     183.       172.       195.
1.0E-7 1/yr design speed                     216.       205.       229.

   45   92    1.327E+04 1.0000    193    176    178
Point  2.864E+00  1.302E+00  6.299E+00  7.763E-04  3.530E-04  1.707E-03
Line   5.828E+00  4.191E+00  8.103E+00  5.984E-05  4.304E-05  8.320E-05
Strike Probability, 1/yr                8.361E-04  3.960E-04  1.791E-03
1.0E-5 1/yr design speed                     155.       143.       168.
1.0E-6 1/yr design speed                     191.       179.       204.
1.0E-7 1/yr design speed                     223.       211.       237.

   45   94    1.327E+04 1.0000    255    224    224
Point  7.769E-01  4.278E-01  1.411E+00  2.783E-04  1.532E-04  5.053E-04
Line   4.877E+00  3.565E+00  6.671E+00  6.616E-05  4.836E-05  9.050E-05
Strike Probability, 1/yr                3.444E-04  2.016E-04  5.958E-04
1.0E-5 1/yr design speed                     144.       135.       153.
1.0E-6 1/yr design speed                     181.       172.       190.
1.0E-7 1/yr design speed                     214.       205.       223.

   45   96    1.327E+04 1.0000    268    188    188
Point  3.924E-01  2.123E-01  7.253E-01  1.477E-04  7.990E-05  2.730E-04
Line   3.264E+00  2.448E+00  4.350E+00  4.653E-05  3.491E-05  6.202E-05
Strike Probability, 1/yr                1.942E-04  1.148E-04  3.350E-04
1.0E-5 1/yr design speed                     135.       126.       144.
1.0E-6 1/yr design speed                     173.       165.       182.
1.0E-7 1/yr design speed                     207.       199.       216.

   45   98    1.327E+04 1.0000    282    171    171
Point  3.727E-01  1.852E-01  7.502E-01  1.476E-04  7.334E-05  2.971E-04
Line   3.060E+00  2.190E+00  4.277E+00  4.591E-05  3.285E-05  6.416E-05
Strike Probability, 1/yr                1.935E-04  1.062E-04  3.613E-04
1.0E-5 1/yr design speed                     134.       125.       145.
1.0E-6 1/yr design speed                     173.       164.       183.
1.0E-7 1/yr design speed                     207.       198.       216.

   45  100    1.327E+04 1.0000    174     98     98
Point  4.879E-01  1.906E-01  1.249E+00  1.192E-04  4.658E-05  3.053E-04
Line   3.859E+00  2.498E+00  5.961E+00  3.572E-05  2.312E-05  5.519E-05
Strike Probability, 1/yr                1.550E-04  6.970E-05  3.605E-04
1.0E-5 1/yr design speed                     130.       116.       144.
1.0E-6 1/yr design speed                     169.       158.       182.
1.0E-7 1/yr design speed                     203.       192.       216.
```

```
   45  102    1.327E+04 1.0000    105     60     60
Point  4.057E-01  1.448E-01  1.136E+00  5.983E-05  2.136E-05  1.676E-04
Line   4.769E+00  2.702E+00  8.415E+00  2.664E-05  1.510E-05  4.701E-05
Strike Probability, 1/yr               8.647E-05  3.645E-05  2.146E-04
1.0E-5 1/yr design speed                    116.        95.       137.
1.0E-6 1/yr design speed                    158.       138.       178.
1.0E-7 1/yr design speed                    195.       176.       214.

   45  104    1.327E+04 1.0000     44     35     35
Point  2.769E-01  5.620E-02  1.364E+00  1.711E-05  3.473E-06  8.428E-05
Line   2.820E+00  1.295E+00  6.141E+00  6.602E-06  3.032E-06  1.438E-05
Strike Probability, 1/yr               2.371E-05  6.505E-06  9.865E-05
1.0E-5 1/yr design speed                     88.        60.       122.
1.0E-6 1/yr design speed                    135.       107.       164.
1.0E-7 1/yr design speed                    174.       148.       202.

   45  106    1.327E+04 1.0000     24     20     20
Point  3.135E-02  6.464E-03  1.521E-01  1.057E-06  2.179E-07  5.126E-06
Line   1.064E+00  4.598E-01  2.462E+00  1.358E-06  5.870E-07  3.144E-06
Strike Probability, 1/yr               2.415E-06  8.049E-07  8.270E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     90.        60.       120.
1.0E-7 1/yr design speed                    137.       113.       163.

   45  108    1.327E+04 1.0000     35     28     28
Point  3.278E-02  1.184E-02  9.075E-02  1.611E-06  5.820E-07  4.461E-06
Line   1.512E+00  7.882E-01  2.902E+00  2.816E-06  1.468E-06  5.404E-06
Strike Probability, 1/yr               4.428E-06  2.050E-06  9.865E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                    104.        84.       125.
1.0E-7 1/yr design speed                    148.       130.       167.

   45  110    1.327E+04 1.0000     13     10     10
Point  8.245E-03  2.498E-03  2.721E-02  1.505E-07  4.562E-08  4.968E-07
Line   8.149E-01  3.032E-01  2.190E+00  5.636E-07  2.097E-07  1.515E-06
Strike Probability, 1/yr               7.142E-07  2.553E-07  2.012E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        89.
1.0E-7 1/yr design speed                    115.        90.       139.

   45  112    1.327E+04 1.0000     19     14     14
Point  1.574E-02  5.603E-03  4.420E-02  4.200E-07  1.495E-07  1.180E-06
Line   7.511E-01  3.675E-01  1.535E+00  7.593E-07  3.714E-07  1.552E-06
Strike Probability, 1/yr               1.179E-06  5.210E-07  2.732E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     71.        60.        96.
1.0E-7 1/yr design speed                    124.       105.       144.

   45  114    1.327E+04 1.0000      4      3      3
Point  4.411E-03  7.176E-04  2.712E-02  2.478E-08  4.032E-09  1.523E-07
Line   7.764E-01  1.263E-01  4.772E+00  1.652E-07  2.688E-08  1.016E-06
Strike Probability, 1/yr               1.900E-07  3.091E-08  1.168E-06
1.0E-5 1/yr design speed                     60.        50.        60.
1.0E-6 1/yr design speed                     60.        50.        73.
1.0E-7 1/yr design speed                     85.        50.       130.
```

```
   45  116    1.327E+04 1.0000     14     12     12
Point  2.270E-01  3.181E-02  1.620E+00  4.464E-06  6.255E-07  3.186E-05
Line   2.233E+00  8.905E-01  5.600E+00  1.663E-06  6.633E-07  4.171E-06
Strike Probability, 1/yr                6.127E-06  1.289E-06  3.603E-05
1.0E-5 1/yr design speed                      60.        60.       101.
1.0E-6 1/yr design speed                     109.        73.       146.
1.0E-7 1/yr design speed                     152.       120.       186.

   45  118    1.327E+04 1.0000     16     15     15
Point  4.014E-01  4.083E-02  3.945E+00  9.020E-06  9.177E-07  8.866E-05
Line   7.008E+00  1.670E+00  2.940E+01  5.965E-06  1.422E-06  2.503E-05
Strike Probability, 1/yr                1.498E-05  2.339E-06  1.137E-04
1.0E-5 1/yr design speed                      78.        60.       125.
1.0E-6 1/yr design speed                     127.        87.       167.
1.0E-7 1/yr design speed                     167.       132.       205.

   45  120    1.327E+04 1.0000      5      4      4
Point  1.099E-01  1.031E-02  1.171E+00  7.715E-07  7.241E-08  8.221E-06
Line   1.672E+00  5.240E-01  5.338E+00  4.449E-07  1.394E-07  1.420E-06
Strike Probability, 1/yr                1.216E-06  2.118E-07  9.641E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      72.        60.       122.
1.0E-7 1/yr design speed                     123.        85.       164.

   45  122    1.327E+04 1.0000     41     38     38
Point  1.981E-02  9.698E-03  4.046E-02  1.141E-06  5.584E-07  2.330E-06
Line   6.672E-01  4.532E-01  9.823E-01  1.455E-06  9.886E-07  2.143E-06
Strike Probability, 1/yr                2.596E-06  1.547E-06  4.473E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      92.        78.       107.
1.0E-7 1/yr design speed                     138.       125.       153.

   45  124    3.316E+02 0.0250      1      1      1
Point  2.557E-03  0.000E+00  0.000E+00  1.436E-07  0.000E+00  0.000E+00
Line   3.000E-01  0.000E+00  0.000E+00  6.384E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                7.821E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.         0.         0.
1.0E-6 1/yr design speed                      60.         0.         0.
1.0E-7 1/yr design speed                     117.         0.         0.

   47   66    1.613E+02 0.0126      0      0      0

   47   68    1.290E+03 0.1010      6      6      6
Point  6.121E-01  5.068E-03  7.392E+01  5.303E-05  4.391E-07  6.405E-03
Line   6.740E+00  5.873E-01  7.735E+01  2.212E-05  1.928E-06  2.539E-04
Strike Probability, 1/yr                7.516E-05  2.367E-06  6.659E-03
1.0E-5 1/yr design speed                     114.        60.       190.
1.0E-6 1/yr design speed                     155.        94.       227.
1.0E-7 1/yr design speed                     191.       140.       261.

   47   86    1.613E+02 0.0126      0      0      0
```

```
   47   88    6.420E+02 0.0502      3      3      3
Point  5.473E-02  1.352E-03  2.215E+00  4.765E-06  1.177E-07  1.929E-04
Line   2.880E+00  2.115E-01  3.921E+01  9.496E-06  6.974E-07  1.293E-04
Strike Probability, 1/yr                1.426E-05  8.152E-07  3.222E-04
1.0E-5 1/yr design speed                      79.        60.       144.
1.0E-6 1/yr design speed                     131.        60.       181.
1.0E-7 1/yr design speed                     169.       122.       214.

   47   90    4.820E+03 0.3772     16     14     14
Point  1.348E+00  1.379E-01  1.318E+01  8.339E-05  8.527E-06  8.154E-04
Line   6.732E+00  2.363E+00  1.918E+01  1.577E-05  5.535E-06  4.494E-05
Strike Probability, 1/yr                9.916E-05  1.406E-05  8.604E-04
1.0E-5 1/yr design speed                     120.        78.       156.
1.0E-6 1/yr design speed                     160.       131.       193.
1.0E-7 1/yr design speed                     195.       170.       227.

   47   92    9.615E+03 0.7524     36     31     31
Point  5.622E+00  6.379E-01  4.955E+01  3.922E-04  4.451E-05  3.457E-03
Line   6.609E+00  2.818E+00  1.550E+01  1.747E-05  7.446E-06  4.097E-05
Strike Probability, 1/yr                4.097E-04  5.195E-05  3.498E-03
1.0E-5 1/yr design speed                     142.       107.       178.
1.0E-6 1/yr design speed                     179.       149.       213.
1.0E-7 1/yr design speed                     213.       184.       246.

   47   94    1.215E+04 0.9505     92     85     85
Point  1.892E-01  8.429E-02  4.248E-01  2.671E-05  1.190E-05  5.996E-05
Line   1.747E+00  1.216E+00  2.509E+00  9.338E-06  6.499E-06  1.341E-05
Strike Probability, 1/yr                3.605E-05  1.840E-05  7.337E-05
1.0E-5 1/yr design speed                     101.        85.       115.
1.0E-6 1/yr design speed                     146.       135.       157.
1.0E-7 1/yr design speed                     183.       174.       193.

   47   96    1.278E+04 1.0000    210    169    169
Point  7.379E-02  4.688E-02  1.161E-01  2.259E-05  1.435E-05  3.556E-05
Line   1.339E+00  1.054E+00  1.703E+00  1.553E-05  1.222E-05  1.975E-05
Strike Probability, 1/yr                3.813E-05  2.657E-05  5.531E-05
1.0E-5 1/yr design speed                     105.        97.       112.
1.0E-6 1/yr design speed                     150.       144.       156.
1.0E-7 1/yr design speed                     186.       181.       193.

   47   98    1.278E+04 1.0000    228    162    162
Point  6.565E-02  4.069E-02  1.059E-01  2.183E-05  1.353E-05  3.522E-05
Line   1.227E+00  9.678E-01  1.557E+00  1.546E-05  1.219E-05  1.960E-05
Strike Probability, 1/yr                3.728E-05  2.571E-05  5.482E-05
1.0E-5 1/yr design speed                     105.        96.       112.
1.0E-6 1/yr design speed                     150.       144.       156.
1.0E-7 1/yr design speed                     186.       181.       192.

   47  100    1.278E+04 1.0000    207    152    152
Point  1.723E-01  9.276E-02  3.200E-01  5.200E-05  2.800E-05  9.659E-05
Line   3.201E+00  2.255E+00  4.544E+00  3.659E-05  2.578E-05  5.195E-05
Strike Probability, 1/yr                8.859E-05  5.377E-05  1.485E-04
1.0E-5 1/yr design speed                     123.       114.       132.
1.0E-6 1/yr design speed                     164.       157.       172.
1.0E-7 1/yr design speed                     199.       191.       207.
```

```
   47  102    1.278E+04 1.0000     99     57     57
Point  1.304E-01  4.736E-02  3.590E-01  1.882E-05  6.837E-06  5.182E-05
Line   2.539E+00  1.430E+00  4.507E+00  1.388E-05  7.820E-06  2.464E-05
Strike Probability, 1/yr                3.271E-05  1.466E-05  7.646E-05
1.0E-5 1/yr design speed                      97.        76.       118.
1.0E-6 1/yr design speed                     141.       123.       161.
1.0E-7 1/yr design speed                     180.       162.       199.

   47  104    1.278E+04 1.0000     60     45     45
Point  1.163E+00  1.910E-01  7.083E+00  1.018E-04  1.671E-05  6.196E-04
Line   3.214E+00  1.573E+00  6.567E+00  1.065E-05  5.212E-06  2.176E-05
Strike Probability, 1/yr                1.124E-04  2.192E-05  6.414E-04
1.0E-5 1/yr design speed                     119.        84.       156.
1.0E-6 1/yr design speed                     160.       128.       194.
1.0E-7 1/yr design speed                     198.       166.       230.

   47  106    1.278E+04 1.0000     46     37     37
Point  1.129E-01  3.604E-02  3.536E-01  7.572E-06  2.417E-06  2.372E-05
Line   1.962E+00  1.005E+00  3.832E+00  4.985E-06  2.553E-06  9.736E-06
Strike Probability, 1/yr                1.256E-05  4.971E-06  3.345E-05
1.0E-5 1/yr design speed                      73.        60.       100.
1.0E-6 1/yr design speed                     124.       102.       146.
1.0E-7 1/yr design speed                     164.       144.       185.

   47  108    1.278E+04 1.0000     33     31     31
Point  2.142E-01  5.298E-02  8.658E-01  1.031E-05  2.549E-06  4.166E-05
Line   2.868E+00  1.403E+00  5.864E+00  5.228E-06  2.557E-06  1.069E-05
Strike Probability, 1/yr                1.553E-05  5.107E-06  5.235E-05
1.0E-5 1/yr design speed                      78.        60.       109.
1.0E-6 1/yr design speed                     127.       103.       154.
1.0E-7 1/yr design speed                     168.       145.       192.

   47  110    1.278E+04 1.0000     42     26     26
Point  1.000E-01  2.720E-02  3.679E-01  6.127E-06  1.666E-06  2.253E-05
Line   1.362E+00  7.406E-01  2.506E+00  3.160E-06  1.718E-06  5.814E-06
Strike Probability, 1/yr                9.287E-06  3.384E-06  2.835E-05
1.0E-5 1/yr design speed                      60.        60.        95.
1.0E-6 1/yr design speed                     117.        94.       142.
1.0E-7 1/yr design speed                     159.       138.       182.

   47  112    1.278E+04 1.0000      6      4      4
Point  2.060E-02  1.700E-03  2.496E-01  1.802E-07  1.488E-08  2.184E-06
Line   7.020E-01  2.162E-01  2.279E+00  2.326E-07  7.165E-08  7.553E-07
Strike Probability, 1/yr                4.129E-07  8.653E-08  2.939E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.        97.
1.0E-7 1/yr design speed                     103.        50.       143.

   47  114    1.278E+04 1.0000      3      1      2
Point  3.977E-04  0.000E+00  0.000E+00  1.740E-09  0.000E+00  0.000E+00
Line   1.373E+00  5.956E-02  3.166E+01  2.275E-07  9.868E-09  5.245E-06
Strike Probability, 1/yr                2.293E-07  9.868E-09  5.245E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.       113.
1.0E-7 1/yr design speed                      91.        50.       158.
```

```
   47  116    1.278E+04 1.0000     18     13     14
Point  7.923E-02  1.837E-02  3.417E-01  2.079E-06  4.822E-07  8.968E-06
Line   1.407E+00  6.325E-01  3.130E+00  1.399E-06  6.288E-07  3.112E-06
Strike Probability, 1/yr               3.478E-06  1.111E-06  1.208E-05
1.0E-5 1/yr design speed                     60.        60.        73.
1.0E-6 1/yr design speed                     98.        68.       127.
1.0E-7 1/yr design speed                    142.       118.       168.

   47  118    1.278E+04 1.0000     17     10     11
Point  2.444E-01  3.395E-02  1.759E+00  6.058E-06  8.416E-07  4.361E-05
Line   2.983E+00  9.012E-01  9.875E+00  2.801E-06  8.462E-07  9.272E-06
Strike Probability, 1/yr               8.859E-06  1.688E-06  5.288E-05
1.0E-5 1/yr design speed                     60.        60.       109.
1.0E-6 1/yr design speed                    116.        79.       154.
1.0E-7 1/yr design speed                    158.       125.       192.

   47  120    1.278E+04 1.0000      2      2      2
Point  5.743E-01  2.542E-05  1.297E+04  1.675E-06  7.414E-11  3.784E-02
Line   2.326E+00  4.696E-02  1.152E+02  2.569E-07  5.187E-09  1.272E-05
Strike Probability, 1/yr               1.932E-06  5.262E-09  3.785E-02
1.0E-5 1/yr design speed                     60.        50.       222.
1.0E-6 1/yr design speed                     83.        50.       256.
1.0E-7 1/yr design speed                    130.        50.       289.

   47  122    8.659E+03 0.6777     15     11     12
Point  7.000E-02  2.103E-02  2.330E-01  2.259E-06  6.787E-07  7.520E-06
Line   1.311E+00  7.591E-01  2.266E+00  1.603E-06  9.280E-07  2.770E-06
Strike Probability, 1/yr               3.862E-06  1.607E-06  1.029E-05
1.0E-5 1/yr design speed                     60.        60.        66.
1.0E-6 1/yr design speed                    100.        78.       124.
1.0E-7 1/yr design speed                    144.       125.       166.

   47  124    1.284E+03 0.1005      0      0      0
```

Appendix B

Results for 4° Boxes

Appendix B

Results for 4° Boxes

This appendix contains the detailed results of the analysis for the 4° boxes. The output for each box generally consists seven lines. However, if there were no tornado events in the box or the information for the tornado events was insufficient to perform an analysis, then there is only one line of output. The first line of output starts with the latitude and longitude of the southeast corner of the box. The next two entries in the line are the land area for the box assumed in the analysis and the fraction of the total box area assumed to be covered by land. The last three items in the first line are the number of total events observed and the number of events included in the calculation of expected values of area and length for events. For some boxes, this is the only line. Care should be taken when using strike probability and wind speed data from this appendix to ensure that the number of tornado events is sufficient to give reasonable results. As a minimum, there should be 10 events, and 20 or more events are desirable.

The second through seventh lines include the results of the calculations. Lines two and three contain the results of the strike probability calculations for the point structure and life-line terms, respectively. In line two, the first number is the expected area, in square miles, for tornado events for the box; the second and third numbers are the lower and upper limits of the 90 percent confidence interval for the expected area. The last three numbers are the expected strike probability for a point structure and the lower and upper limits for the strike probability confidence interval. The format for the information in the third line is similar to that for the second line. The first three numbers are the expected length, in miles, for the life-line term and the lower and upper limits on the expected length. The last three numbers are the additional strike probability for finite structures, assuming a characteristic dimension of 200 ft for the structure.

The fourth line gives the expected total strike probability for the box and the lower and upper bounds of the 90 percent confidence interval. These values are the sums of the values direct above in lines two and three. Lines five through seven give the maximum wind speeds, in mile per hour, for 10^{-5} yr^{-1}, 10^{-6} yr^{-1}, and 10^{-7} yr^{-1} design criteria. As before, the first number is the expected value, and the second and third numbers are the lower and upper limits of the 90% confidence interval.

The lower limit for the maximum wind speed in a tornado is 65 mph. Two wind speeds less than 65 mph are used to provide information when the design wind speed would be less than 65 mph. A design wind speed of 50 mph indicates that the tornado strike probability for the box is less than 10^{-7} yr^{-1}. A design wind speed of 60 mph indicates that the design wind speed for the design probability specified at the beginning of the line is less than 65 mph, but that the design wind speed at the 10^{-7} yr^{-1} probability level exceeds 65 mph.

```
   25   78    2.507E+04 0.3685   1039    874    874
Point  6.546E-02  5.281E-02  8.113E-02  5.054E-05  4.078E-05  6.264E-05
Line   1.494E+00  1.326E+00  1.682E+00  4.368E-05  3.879E-05  4.918E-05
Strike Probability, 1/yr                9.422E-05  7.957E-05  1.118E-04
1.0E-5 1/yr design speed                     121.       117.       126.
1.0E-6 1/yr design speed                     161.       157.       165.
1.0E-7 1/yr design speed                     195.       191.       199.

   25   82    5.692E+03 0.0836    584    527    527
Point  6.196E-02  4.658E-02  8.241E-02  1.185E-04  8.905E-05  1.576E-04
Line   1.518E+00  1.299E+00  1.773E+00  1.099E-04  9.410E-05  1.284E-04
Strike Probability, 1/yr                2.284E-04  1.832E-04  2.859E-04
1.0E-5 1/yr design speed                     142.       138.       147.
1.0E-6 1/yr design speed                     180.       177.       184.
1.0E-7 1/yr design speed                     213.       209.       217.


   25   94    1.330E+04 0.1954    418    318    322
Point  5.743E-02  4.165E-02  7.919E-02  3.363E-05  2.439E-05  4.637E-05
Line   1.217E+00  1.021E+00  1.451E+00  2.699E-05  2.264E-05  3.219E-05
Strike Probability, 1/yr                6.062E-05  4.703E-05  7.856E-05
1.0E-5 1/yr design speed                     116.       111.       121.
1.0E-6 1/yr design speed                     159.       154.       163.
1.0E-7 1/yr design speed                     194.       189.       199.

   25   98    2.260E+04 0.3322    160    138    138
Point  2.401E-01  1.340E-01  4.303E-01  3.167E-05  1.767E-05  5.675E-05
Line   2.143E+00  1.595E+00  2.880E+00  1.071E-05  7.967E-06  1.439E-05
Strike Probability, 1/yr                4.237E-05  2.563E-05  7.114E-05
1.0E-5 1/yr design speed                     105.        94.       115.
1.0E-6 1/yr design speed                     149.       141.       157.
1.0E-7 1/yr design speed                     185.       178.       193.


   29   78    1.711E+04 0.2614    411    369    370
Point  1.650E-01  1.164E-01  2.338E-01  7.384E-05  5.210E-05  1.046E-04
Line   2.318E+00  1.920E+00  2.798E+00  3.929E-05  3.254E-05  4.743E-05
Strike Probability, 1/yr                1.131E-04  8.464E-05  1.521E-04
1.0E-5 1/yr design speed                     123.       117.       130.
1.0E-6 1/yr design speed                     162.       156.       169.
1.0E-7 1/yr design speed                     197.       191.       204.


   29   82    5.508E+04 0.8414   1262   1144   1154
Point  4.771E-01  3.869E-01  5.883E-01  2.037E-04  1.652E-04  2.511E-04
Line   4.058E+00  3.616E+00  4.555E+00  6.562E-05  5.847E-05  7.365E-05
Strike Probability, 1/yr                2.693E-04  2.237E-04  3.248E-04
1.0E-5 1/yr design speed                     140.       137.       144.
1.0E-6 1/yr design speed                     178.       175.       182.
1.0E-7 1/yr design speed                     211.       207.       216.
```

```
   29   86    4.557E+04 0.6961   1431   1250   1252
Point  1.008E+00  7.932E-01  1.282E+00  5.900E-04  4.641E-04  7.501E-04
Line   5.708E+00  5.021E+00  6.490E+00  1.265E-04  1.113E-04  1.438E-04
Strike Probability, 1/yr                7.165E-04  5.754E-04  8.940E-04
1.0E-5 1/yr design speed                     156.       152.       160.
1.0E-6 1/yr design speed                     191.       187.       196.
1.0E-7 1/yr design speed                     223.       218.       229.

   29   90    5.716E+04 0.8731   1910   1786   1786
Point  5.584E-01  4.749E-01  6.566E-01  3.477E-04  2.957E-04  4.089E-04
Line   4.934E+00  4.516E+00  5.390E+00  1.164E-04  1.065E-04  1.271E-04
Strike Probability, 1/yr                4.640E-04  4.022E-04  5.360E-04
1.0E-5 1/yr design speed                     150.       147.       153.
1.0E-6 1/yr design speed                     186.       183.       190.
1.0E-7 1/yr design speed                     219.       215.       223.

   29   94    6.297E+04 0.9619   2357   2047   2057
Point  4.302E-01  3.589E-01  5.157E-01  3.000E-04  2.503E-04  3.596E-04
Line   2.907E+00  2.664E+00  3.173E+00  7.680E-05  7.037E-05  8.381E-05
Strike Probability, 1/yr                3.768E-04  3.207E-04  4.435E-04
1.0E-5 1/yr design speed                     146.       142.       149.
1.0E-6 1/yr design speed                     182.       179.       186.
1.0E-7 1/yr design speed                     215.       211.       220.

   29   98    6.256E+04 0.9556   1181   1063   1066
Point  2.435E-01  1.923E-01  3.084E-01  8.565E-05  6.764E-05  1.085E-04
Line   2.030E+00  1.812E+00  2.273E+00  2.704E-05  2.415E-05  3.029E-05
Strike Probability, 1/yr                1.127E-04  9.179E-05  1.388E-04
1.0E-5 1/yr design speed                     125.       121.       128.
1.0E-6 1/yr design speed                     164.       161.       168.
1.0E-7 1/yr design speed                     199.       195.       204.

   29  102    5.139E+04 0.7850    435    364    364
Point  1.836E-01  1.265E-01  2.666E-01  2.896E-05  1.995E-05  4.204E-05
Line   1.806E+00  1.503E+00  2.170E+00  1.079E-05  8.981E-06  1.296E-05
Strike Probability, 1/yr                3.975E-05  2.893E-05  5.501E-05
1.0E-5 1/yr design speed                     100.        90.       110.
1.0E-6 1/yr design speed                     144.       133.       155.
1.0E-7 1/yr design speed                     183.       171.       193.

   29  106    2.303E+04 0.3517     38     24     24
Point  9.348E-02  2.995E-02  2.917E-01  2.874E-06  9.209E-07  8.970E-06
Line   1.450E+00  7.846E-01  2.680E+00  1.689E-06  9.138E-07  3.121E-06
Strike Probability, 1/yr                4.563E-06  1.835E-06  1.209E-05
1.0E-5 1/yr design speed                      60.        60.        73.
1.0E-6 1/yr design speed                     103.        81.       127.
1.0E-7 1/yr design speed                     147.       127.       168.
```

```
   29  110    2.201E+04 0.3363     41     30     30
Point  4.373E-02  1.861E-02  1.028E-01  1.518E-06  6.457E-07  3.567E-06
Line   1.648E+00  9.210E-01  2.948E+00  2.166E-06  1.211E-06  3.875E-06
Strike Probability, 1/yr               3.684E-06  1.856E-06  7.442E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                    100.        82.       118.
1.0E-7 1/yr design speed                    145.       128.       162.

   29  114    5.637E+03 0.0861     19     12     12
Point  1.830E-02  4.857E-03  6.898E-02  1.149E-06  3.050E-07  4.332E-06
Line   5.531E-01  2.829E-01  1.081E+00  1.316E-06  6.730E-07  2.573E-06
Strike Probability, 1/yr               2.465E-06  9.780E-07  6.904E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     90.        60.       116.
1.0E-7 1/yr design speed                    137.       117.       159.


   33   74    1.841E+04 0.2942    455    411    411
Point  3.633E-01  2.558E-01  5.159E-01  1.673E-04  1.178E-04  2.376E-04
Line   3.293E+00  2.725E+00  3.980E+00  5.745E-05  4.753E-05  6.943E-05
Strike Probability, 1/yr               2.247E-04  1.653E-04  3.070E-04
1.0E-5 1/yr design speed                    134.       128.       141.
1.0E-6 1/yr design speed                    173.       166.       179.
1.0E-7 1/yr design speed                    207.       201.       214.

   33   78    5.898E+04 0.9427    969    880    885
Point  8.021E-01  6.098E-01  1.055E+00  2.455E-04  1.867E-04  3.229E-04
Line   4.522E+00  3.936E+00  5.195E+00  5.243E-05  4.563E-05  6.024E-05
Strike Probability, 1/yr               2.980E-04  2.323E-04  3.832E-04
1.0E-5 1/yr design speed                    138.       132.       144.
1.0E-6 1/yr design speed                    176.       170.       182.
1.0E-7 1/yr design speed                    212.       206.       218.

   33   82    6.256E+04 1.0000    972    939    940
Point  1.090E+00  8.763E-01  1.355E+00  3.155E-04  2.537E-04  3.923E-04
Line   5.909E+00  5.278E+00  6.615E+00  6.479E-05  5.787E-05  7.253E-05
Strike Probability, 1/yr               3.803E-04  3.115E-04  4.649E-04
1.0E-5 1/yr design speed                    145.       141.       149.
1.0E-6 1/yr design speed                    182.       178.       186.
1.0E-7 1/yr design speed                    214.       210.       220.

   33   86    6.256E+04 1.0000   1714   1575   1575
Point  2.433E+00  1.952E+00  3.032E+00  1.242E-03  9.966E-04  1.548E-03
Line   7.737E+00  6.971E+00  8.586E+00  1.496E-04  1.348E-04  1.660E-04
Strike Probability, 1/yr               1.392E-03  1.131E-03  1.714E-03
1.0E-5 1/yr design speed                    164.       160.       169.
1.0E-6 1/yr design speed                    199.       194.       204.
1.0E-7 1/yr design speed                    231.       225.       237.
```

```
   33   90    6.256E+04 1.0000   1733   1603   1603
Point  1.875E+00  1.557E+00  2.257E+00  9.675E-04  8.035E-04  1.165E-03
Line   7.579E+00  6.910E+00  8.313E+00  1.482E-04  1.351E-04  1.625E-04
Strike Probability, 1/yr                1.116E-03  9.386E-04  1.328E-03
1.0E-5 1/yr design speed                     162.       158.       165.
1.0E-6 1/yr design speed                     196.       192.       201.
1.0E-7 1/yr design speed                     228.       224.       234.

   33   94    6.256E+04 1.0000   2745   2274   2275
Point  1.584E+00  1.312E+00  1.912E+00  1.295E-03  1.073E-03  1.563E-03
Line   5.862E+00  5.349E+00  6.423E+00  1.815E-04  1.656E-04  1.989E-04
Strike Probability, 1/yr                1.476E-03  1.238E-03  1.762E-03
1.0E-5 1/yr design speed                     166.       162.       170.
1.0E-6 1/yr design speed                     200.       196.       205.
1.0E-7 1/yr design speed                     232.       227.       238.

   33   98    6.256E+04 1.0000   2545   2099   2099
Point  7.066E-01  5.844E-01  8.543E-01  5.355E-04  4.429E-04  6.475E-04
Line   3.620E+00  3.303E+00  3.968E+00  1.039E-04  9.483E-05  1.139E-04
Strike Probability, 1/yr                6.395E-04  5.378E-04  7.614E-04
1.0E-5 1/yr design speed                     153.       150.       157.
1.0E-6 1/yr design speed                     189.       185.       193.
1.0E-7 1/yr design speed                     221.       217.       227.

   33  102    6.256E+04 1.0000    824    662    662
Point  2.544E-01  1.903E-01  3.400E-01  6.243E-05  4.671E-05  8.342E-05
Line   2.919E+00  2.482E+00  3.432E+00  2.713E-05  2.308E-05  3.190E-05
Strike Probability, 1/yr                8.956E-05  6.979E-05  1.153E-04
1.0E-5 1/yr design speed                     116.       108.       126.
1.0E-6 1/yr design speed                     158.       148.       168.
1.0E-7 1/yr design speed                     196.       185.       205.

   33  106    6.256E+04 1.0000     53     31     31
Point  1.083E-01  3.227E-02  3.634E-01  1.709E-06  5.093E-07  5.737E-06
Line   1.358E+00  7.449E-01  2.478E+00  8.122E-07  4.453E-07  1.481E-06
Strike Probability, 1/yr                2.522E-06  9.547E-07  7.218E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      90.        60.       116.
1.0E-7 1/yr design speed                     136.       114.       159.

   33  110    6.256E+04 1.0000    117     81     81
Point  1.365E-01  6.252E-02  2.980E-01  4.756E-06  2.179E-06  1.038E-05
Line   2.127E+00  1.414E+00  3.199E+00  2.807E-06  1.866E-06  4.223E-06
Strike Probability, 1/yr                7.563E-06  4.045E-06  1.461E-05
1.0E-5 1/yr design speed                      60.        60.        78.
1.0E-6 1/yr design speed                     114.        98.       131.
1.0E-7 1/yr design speed                     156.       140.       172.
```

```
   33  114    6.137E+04 0.9809     96     78     78
Point  4.307E-02  2.300E-02  8.065E-02  1.255E-06  6.704E-07  2.351E-06
Line   9.690E-01  6.970E-01  1.347E+00  1.070E-06  7.695E-07  1.487E-06
Strike Probability, 1/yr               2.325E-06  1.440E-06  3.838E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     89.        76.       104.
1.0E-7 1/yr design speed                    136.       123.       149.

   33  118    3.490E+04 0.5579     96     91     91
Point  3.620E-02  1.951E-02  6.716E-02  1.855E-06  1.000E-06  3.442E-06
Line   9.286E-01  6.765E-01  1.275E+00  1.803E-06  1.313E-06  2.474E-06
Strike Probability, 1/yr               3.658E-06  2.313E-06  5.916E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                    100.        86.       113.
1.0E-7 1/yr design speed                    144.       131.       157.

   33  122    1.919E+02 0.0031      1      1      1
Point  5.682E-02  0.000E+00  0.000E+00  5.517E-06  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  3.678E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr               9.195E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                    118.        50.        50.
1.0E-7 1/yr design speed                    159.        50.        50.

   37   70    2.181E+03 0.0367     25     22     22
Point  4.298E-02  2.111E-02  8.751E-02  9.179E-06  4.508E-06  1.869E-05
Line   1.086E+00  6.158E-01  1.917E+00  8.789E-06  4.982E-06  1.551E-05
Strike Probability, 1/yr               1.797E-05  9.490E-06  3.420E-05
1.0E-5 1/yr design speed                     84.        60.       102.
1.0E-6 1/yr design speed                    133.       121.       146.
1.0E-7 1/yr design speed                    171.       160.       182.

   37   74    4.600E+04 0.7751    816    734    734
Point  3.016E-01  2.419E-01  3.761E-01  9.968E-05  7.994E-05  1.243E-04
Line   2.764E+00  2.465E+00  3.100E+00  3.460E-05  3.086E-05  3.880E-05
Strike Probability, 1/yr               1.343E-04  1.108E-04  1.631E-04
1.0E-5 1/yr design speed                    125.       120.       130.
1.0E-6 1/yr design speed                    164.       160.       169.
1.0E-7 1/yr design speed                    200.       195.       205.

   37   78    5.936E+04 1.0000    481    398    398
Point  4.118E-01  3.054E-01  5.554E-01  6.218E-05  4.611E-05  8.385E-05
Line   3.563E+00  3.036E+00  4.181E+00  2.038E-05  1.736E-05  2.391E-05
Strike Probability, 1/yr               8.256E-05  6.347E-05  1.078E-04
1.0E-5 1/yr design speed                    118.       113.       124.
1.0E-6 1/yr design speed                    160.       155.       164.
1.0E-7 1/yr design speed                    195.       190.       200.
```

```
   37   82    5.936E+04 1.0000   1243   1042   1043
Point  1.179E+00  9.323E-01  1.492E+00  4.601E-04  3.638E-04  5.821E-04
Line   6.230E+00  5.505E+00  7.050E+00  9.208E-05  8.137E-05  1.042E-04
Strike Probability, 1/yr               5.522E-04  4.451E-04  6.863E-04
1.0E-5 1/yr design speed                    151.       147.       155.
1.0E-6 1/yr design speed                    187.       183.       192.
1.0E-7 1/yr design speed                    220.       214.       225.

   37   86    5.936E+04 1.0000   1829   1503   1504
Point  1.286E+00  1.025E+00  1.615E+00  7.386E-04  5.884E-04  9.271E-04
Line   6.349E+00  5.652E+00  7.131E+00  1.381E-04  1.229E-04  1.551E-04
Strike Probability, 1/yr               8.766E-04  7.113E-04  1.082E-03
1.0E-5 1/yr design speed                    158.       154.       162.
1.0E-6 1/yr design speed                    194.       189.       198.
1.0E-7 1/yr design speed                    226.       220.       231.

   37   90    5.936E+04 1.0000   1398   1292   1292
Point  1.051E+00  8.349E-01  1.323E+00  4.613E-04  3.664E-04  5.807E-04
Line   5.824E+00  5.179E+00  6.549E+00  9.681E-05  8.609E-05  1.089E-04
Strike Probability, 1/yr               5.581E-04  4.525E-04  6.896E-04
1.0E-5 1/yr design speed                    152.       148.       155.
1.0E-6 1/yr design speed                    187.       183.       192.
1.0E-7 1/yr design speed                    220.       215.       225.

   37   94    5.936E+04 1.0000   2233   1827   1831
Point  1.722E+00  1.395E+00  2.125E+00  1.207E-03  9.778E-04  1.489E-03
Line   7.256E+00  6.518E+00  8.077E+00  1.927E-04  1.731E-04  2.145E-04
Strike Probability, 1/yr               1.399E-03  1.151E-03  1.704E-03
1.0E-5 1/yr design speed                    165.       161.       169.
1.0E-6 1/yr design speed                    200.       195.       205.
1.0E-7 1/yr design speed                    231.       226.       237.

   37   98    5.936E+04 1.0000   2047   1607   1607
Point  6.808E-01  5.571E-01  8.319E-01  4.374E-04  3.580E-04  5.345E-04
Line   5.082E+00  4.553E+00  5.673E+00  1.237E-04  1.108E-04  1.381E-04
Strike Probability, 1/yr               5.612E-04  4.688E-04  6.726E-04
1.0E-5 1/yr design speed                    153.       149.       156.
1.0E-6 1/yr design speed                    188.       185.       193.
1.0E-7 1/yr design speed                    221.       216.       226.

   37  102    5.936E+04 1.0000   1399   1183   1183
Point  5.575E-02  4.753E-02  6.538E-02  2.448E-05  2.087E-05  2.871E-05
Line   1.009E+00  9.202E-01  1.106E+00  1.678E-05  1.531E-05  1.839E-05
Strike Probability, 1/yr               4.126E-05  3.618E-05  4.710E-05
1.0E-5 1/yr design speed                    102.        95.       108.
1.0E-6 1/yr design speed                    146.       138.       153.
1.0E-7 1/yr design speed                    184.       176.       192.
```

```
   37  106    5.936E+04 1.0000     41     36     38
Point  9.577E-02  3.522E-02  2.604E-01  1.233E-06  4.533E-07  3.351E-06
Line   1.279E+00  7.658E-01  2.135E+00  6.233E-07  3.733E-07  1.041E-06
Strike Probability, 1/yr               1.856E-06  8.267E-07  4.392E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     83.        60.       106.
1.0E-7 1/yr design speed                    131.       112.       151.

   37  110    5.936E+04 1.0000     71     53     53
Point  6.934E-02  2.597E-02  1.851E-01  1.545E-06  5.788E-07  4.126E-06
Line   1.001E+00  6.382E-01  1.570E+00  8.450E-07  5.387E-07  1.325E-06
Strike Probability, 1/yr               2.390E-06  1.118E-06  5.452E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     89.        68.       110.
1.0E-7 1/yr design speed                    135.       118.       155.

   37  114    5.936E+04 1.0000     27     19     22
Point  5.153E-02  9.132E-03  2.908E-01  4.367E-07  7.740E-08  2.464E-06
Line   7.684E-01  3.995E-01  1.478E+00  2.467E-07  1.283E-07  4.745E-07
Strike Probability, 1/yr               6.834E-07  2.057E-07  2.939E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        96.
1.0E-7 1/yr design speed                    111.        84.       143.

   37  118    5.936E+04 1.0000     78     61     61
Point  3.929E-02  2.062E-02  7.485E-02  9.620E-07  5.050E-07  1.833E-06
Line   1.060E+00  7.259E-01  1.547E+00  9.827E-07  6.732E-07  1.435E-06
Strike Probability, 1/yr               1.945E-06  1.178E-06  3.267E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     84.        70.       100.
1.0E-7 1/yr design speed                    133.       119.       147.

   37  122    2.154E+04 0.3629     35     30     31
Point  1.267E-01  4.639E-02  3.461E-01  3.837E-06  1.405E-06  1.048E-05
Line   1.822E+00  1.048E+00  3.166E+00  2.089E-06  1.202E-06  3.631E-06
Strike Probability, 1/yr               5.926E-06  2.606E-06  1.411E-05
1.0E-5 1/yr design speed                     60.        60.        78.
1.0E-6 1/yr design speed                    109.        88.       130.
1.0E-7 1/yr design speed                    152.       133.       171.

   41   66    8.187E+03 0.1466     26     25     25
Point  1.667E-01  7.369E-02  3.773E-01  9.867E-06  4.360E-06  2.233E-05
Line   4.281E+00  2.248E+00  8.153E+00  9.595E-06  5.038E-06  1.827E-05
Strike Probability, 1/yr               1.946E-05  9.399E-06  4.060E-05
1.0E-5 1/yr design speed                     86.        60.       105.
1.0E-6 1/yr design speed                    135.       121.       149.
1.0E-7 1/yr design speed                    172.       160.       185.
```

```
   41   70    4.557E+04 0.8158    456    412    412
Point  2.606E-01  1.895E-01  3.582E-01  4.858E-05  3.534E-05  6.679E-05
Line   2.844E+00  2.377E+00  3.404E+00  2.009E-05  1.679E-05  2.404E-05
Strike Probability, 1/yr                6.867E-05  5.213E-05  9.083E-05
1.0E-5 1/yr design speed                     113.       106.       119.
1.0E-6 1/yr design speed                     154.       148.       160.
1.0E-7 1/yr design speed                     190.       184.       196.

   41   74    4.335E+04 0.7760    288    267    267
Point  1.088E+00  6.831E-01  1.733E+00  1.347E-04  8.456E-05  2.145E-04
Line   3.823E+00  3.122E+00  4.682E+00  1.793E-05  1.464E-05  2.196E-05
Strike Probability, 1/yr                1.526E-04  9.920E-05  2.365E-04
1.0E-5 1/yr design speed                     125.       116.       134.
1.0E-6 1/yr design speed                     165.       156.       174.
1.0E-7 1/yr design speed                     202.       193.       210.

   41   78    1.848E+04 0.3308    277    236    236
Point  1.758E+00  1.050E+00  2.942E+00  4.909E-04  2.933E-04  8.217E-04
Line   6.130E+00  4.839E+00  7.766E+00  6.485E-05  5.119E-05  8.216E-05
Strike Probability, 1/yr                5.558E-04  3.445E-04  9.038E-04
1.0E-5 1/yr design speed                     150.       142.       158.
1.0E-6 1/yr design speed                     186.       178.       194.
1.0E-7 1/yr design speed                     219.       210.       228.

   41   82    4.387E+04 0.7854   1069    910    910
Point  1.078E+00  8.172E-01  1.422E+00  4.895E-04  3.710E-04  6.458E-04
Line   6.085E+00  5.272E+00  7.024E+00  1.047E-04  9.067E-05  1.208E-04
Strike Probability, 1/yr                5.942E-04  4.617E-04  7.666E-04
1.0E-5 1/yr design speed                     153.       148.       157.
1.0E-6 1/yr design speed                     188.       184.       194.
1.0E-7 1/yr design speed                     221.       215.       227.

   41   86    3.989E+04 0.7141   1149    950    951
Point  9.888E-01  7.626E-01  1.282E+00  5.307E-04  4.093E-04  6.880E-04
Line   6.534E+00  5.666E+00  7.535E+00  1.328E-04  1.152E-04  1.532E-04
Strike Probability, 1/yr                6.635E-04  5.245E-04  8.412E-04
1.0E-5 1/yr design speed                     155.       151.       159.
1.0E-6 1/yr design speed                     190.       186.       195.
1.0E-7 1/yr design speed                     223.       217.       228.

   41   90    5.586E+04 1.0000   1757   1540   1542
Point  1.527E+00  1.206E+00  1.933E+00  8.950E-04  7.070E-04  1.133E-03
Line   6.845E+00  6.075E+00  7.714E+00  1.520E-04  1.349E-04  1.712E-04
Strike Probability, 1/yr                1.047E-03  8.419E-04  1.304E-03
1.0E-5 1/yr design speed                     161.       157.       165.
1.0E-6 1/yr design speed                     196.       191.       201.
1.0E-7 1/yr design speed                     228.       222.       234.
```

```
   41   94    5.586E+04 1.0000   1831   1497   1497
Point  8.658E-01  6.914E-01  1.084E+00  5.288E-04  4.223E-04  6.622E-04
Line   5.415E+00  4.789E+00  6.122E+00  1.253E-04  1.108E-04  1.416E-04
Strike Probability, 1/yr               6.541E-04  5.331E-04  8.038E-04
1.0E-5 1/yr design speed                    155.       151.       158.
1.0E-6 1/yr design speed                    190.       186.       195.
1.0E-7 1/yr design speed                    222.       217.       228.

   41   98    5.586E+04 1.0000   1043    770    771
Point  7.060E-01  4.993E-01  9.982E-01  2.456E-04  1.737E-04  3.473E-04
Line   5.158E+00  4.286E+00  6.206E+00  6.797E-05  5.648E-05  8.179E-05
Strike Probability, 1/yr               3.136E-04  2.302E-04  4.291E-04
1.0E-5 1/yr design speed                    143.       137.       148.
1.0E-6 1/yr design speed                    180.       175.       185.
1.0E-7 1/yr design speed                    213.       207.       219.

   41  102    5.586E+04 1.0000    871    656    659
Point  1.628E-01  1.206E-01  2.198E-01  4.730E-05  3.505E-05  6.385E-05
Line   2.314E+00  1.960E+00  2.731E+00  2.546E-05  2.157E-05  3.005E-05
Strike Probability, 1/yr               7.277E-05  5.662E-05  9.390E-05
1.0E-5 1/yr design speed                    113.       104.       122.
1.0E-6 1/yr design speed                    155.       145.       164.
1.0E-7 1/yr design speed                    193.       183.       202.

   41  106    5.586E+04 1.0000    142    109    109
Point  1.220E-01  6.574E-02  2.265E-01  5.780E-06  3.114E-06  1.073E-05
Line   1.313E+00  9.961E-01  1.730E+00  2.355E-06  1.787E-06  3.103E-06
Strike Probability, 1/yr               8.135E-06  4.901E-06  1.383E-05
1.0E-5 1/yr design speed                     60.        60.        77.
1.0E-6 1/yr design speed                    114.       101.       129.
1.0E-7 1/yr design speed                    156.       143.       170.

   41  110    5.586E+04 1.0000    120    101    103
Point  1.007E-01  5.228E-02  1.941E-01  4.033E-06  2.093E-06  7.771E-06
Line   1.458E+00  1.055E+00  2.014E+00  2.210E-06  1.600E-06  3.054E-06
Strike Probability, 1/yr               6.243E-06  3.692E-06  1.083E-05
1.0E-5 1/yr design speed                     60.        60.        68.
1.0E-6 1/yr design speed                    110.        96.       125.
1.0E-7 1/yr design speed                    152.       138.       167.

   41  114    5.586E+04 1.0000     71     62     62
Point  2.635E-02  1.418E-02  4.895E-02  6.241E-07  3.359E-07  1.159E-06
Line   1.061E+00  7.215E-01  1.561E+00  9.522E-07  6.473E-07  1.401E-06
Strike Probability, 1/yr               1.576E-06  9.832E-07  2.560E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     80.        60.        94.
1.0E-7 1/yr design speed                    129.       116.       143.
```

```
   41  118    5.586E+04 1.0000     16     15     15
Point  2.438E-02  7.178E-03  8.282E-02  1.301E-07  3.831E-08  4.420E-07
Line   6.614E-01  3.618E-01  1.209E+00  1.337E-07  7.315E-08  2.444E-07
Strike Probability, 1/yr               2.638E-07  1.115E-07  6.864E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     92.        68.       116.

   41  122    3.038E+04 0.5438     24     20     21
Point  1.263E-02  6.014E-03  2.653E-02  1.859E-07  8.854E-08  3.905E-07
Line   5.669E-01  3.630E-01  8.853E-01  3.161E-07  2.024E-07  4.937E-07
Strike Probability, 1/yr               5.020E-07  2.909E-07  8.842E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                    107.        92.       122.

   45   66    1.671E+04 0.3209     33     30     30
Point  3.506E-01  9.006E-02  1.365E+00  1.290E-05  3.313E-06  5.022E-05
Line   5.605E+00  2.379E+00  1.321E+01  7.811E-06  3.315E-06  1.841E-05
Strike Probability, 1/yr               2.071E-05  6.628E-06  6.863E-05
1.0E-5 1/yr design speed                     87.        60.       113.
1.0E-6 1/yr design speed                    135.       113.       155.
1.0E-7 1/yr design speed                    172.       154.       192.

   45   70    3.073E+03 0.0590      4      3      3
Point  6.193E-01  1.534E-03  2.501E+02  1.502E-05  3.720E-08  6.067E-03
Line   1.150E+00  2.257E-01  5.858E+00  1.056E-06  2.073E-07  5.382E-06
Strike Probability, 1/yr               1.608E-05  2.445E-07  6.072E-03
1.0E-5 1/yr design speed                     78.        60.       188.
1.0E-6 1/yr design speed                    125.        60.       225.
1.0E-7 1/yr design speed                    165.        96.       260.

   45   74    6.726E+03 0.1291      0      0      0

   45   82    6.797E+03 0.1305     46     39     39
Point  3.715E-01  1.177E-01  1.173E+00  4.684E-05  1.484E-05  1.479E-04
Line   3.582E+00  1.972E+00  6.506E+00  1.711E-05  9.421E-06  3.107E-05
Strike Probability, 1/yr               6.395E-05  2.426E-05  1.789E-04
1.0E-5 1/yr design speed                    111.        90.       131.
1.0E-6 1/yr design speed                    153.       136.       170.
1.0E-7 1/yr design speed                    189.       173.       206.

   45   86    2.036E+04 0.3908    134    119    119
Point  1.896E+00  8.500E-01  4.228E+00  2.325E-04  1.043E-04  5.186E-04
Line   8.340E+00  5.484E+00  1.268E+01  3.875E-05  2.548E-05  5.893E-05
Strike Probability, 1/yr               2.713E-04  1.297E-04  5.775E-04
1.0E-5 1/yr design speed                    136.       122.       150.
1.0E-6 1/yr design speed                    175.       161.       188.
1.0E-7 1/yr design speed                    210.       197.       224.
```

```
   45   90    3.932E+04 0.7549    349    318    320
Point  2.939E+00  1.682E+00  5.135E+00  4.861E-04  2.782E-04  8.492E-04
Line   6.901E+00  5.390E+00  8.837E+00  4.323E-05  3.376E-05  5.535E-05
Strike Probability, 1/yr                5.293E-04  3.120E-04  9.045E-04
1.0E-5 1/yr design speed                     148.       139.       157.
1.0E-6 1/yr design speed                     184.       176.       194.
1.0E-7 1/yr design speed                     217.       208.       227.

   45   94    5.146E+04 0.9879    818    659    659
Point  3.135E-01  2.294E-01  4.284E-01  9.285E-05  6.794E-05  1.269E-04
Line   2.829E+00  2.420E+00  3.307E+00  3.174E-05  2.715E-05  3.711E-05
Strike Probability, 1/yr                1.246E-04  9.510E-05  1.640E-04
1.0E-5 1/yr design speed                     127.       122.       132.
1.0E-6 1/yr design speed                     166.       162.       171.
1.0E-7 1/yr design speed                     201.       196.       206.

   45   98    5.209E+04 1.0000    882    574    574
Point  1.975E-01  1.415E-01  2.756E-01  6.230E-05  4.464E-05  8.694E-05
Line   2.558E+00  2.159E+00  3.031E+00  3.057E-05  2.580E-05  3.623E-05
Strike Probability, 1/yr                9.287E-05  7.044E-05  1.232E-04
1.0E-5 1/yr design speed                     123.       117.       128.
1.0E-6 1/yr design speed                     163.       159.       168.
1.0E-7 1/yr design speed                     198.       193.       203.

   45  102    5.209E+04 1.0000    304    193    193
Point  3.792E-01  1.941E-01  7.407E-01  4.123E-05  2.111E-05  8.054E-05
Line   3.436E+00  2.467E+00  4.786E+00  1.415E-05  1.016E-05  1.971E-05
Strike Probability, 1/yr                5.538E-05  3.127E-05  1.003E-04
1.0E-5 1/yr design speed                     107.        92.       123.
1.0E-6 1/yr design speed                     150.       135.       165.
1.0E-7 1/yr design speed                     188.       173.       203.

   45  106    5.209E+04 1.0000    136    114    114
Point  9.904E-02  5.023E-02  1.953E-01  4.818E-06  2.444E-06  9.500E-06
Line   1.955E+00  1.346E+00  2.840E+00  3.602E-06  2.480E-06  5.232E-06
Strike Probability, 1/yr                8.420E-06  4.923E-06  1.473E-05
1.0E-5 1/yr design speed                      60.        60.        79.
1.0E-6 1/yr design speed                     116.       102.       131.
1.0E-7 1/yr design speed                     158.       144.       172.

   45  110    5.209E+04 1.0000     80     54     54
Point  3.931E-02  1.862E-02  8.299E-02  1.125E-06  5.328E-07  2.375E-06
Line   1.036E+00  6.914E-01  1.552E+00  1.123E-06  7.494E-07  1.682E-06
Strike Probability, 1/yr                2.248E-06  1.282E-06  4.057E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      88.        73.       105.
1.0E-7 1/yr design speed                     135.       121.       151.
```

```
   45  114    5.209E+04 1.0000     39     29     31
Point  1.175E-01  3.521E-02  3.919E-01  1.639E-06  4.912E-07  5.467E-06
Line   1.657E+00  9.368E-01  2.932E+00  8.757E-07  4.950E-07  1.549E-06
Strike Probability, 1/yr               2.514E-06  9.862E-07  7.016E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     90.        60.       115.
1.0E-7 1/yr design speed                    136.       115.       159.

   45  118    5.209E+04 1.0000     39     30     31
Point  2.752E-01  6.995E-02  1.083E+00  3.839E-06  9.758E-07  1.510E-05
Line   4.133E+00  1.808E+00  9.445E+00  2.184E-06  9.555E-07  4.991E-06
Strike Probability, 1/yr               6.023E-06  1.931E-06  2.009E-05
1.0E-5 1/yr design speed                     60.        60.        87.
1.0E-6 1/yr design speed                    109.        82.       136.
1.0E-7 1/yr design speed                    152.       128.       177.

   45  122    2.354E+04 0.4519     57     50     51
Point  3.039E-02  1.568E-02  5.891E-02  1.371E-06  7.072E-07  2.658E-06
Line   8.245E-01  5.883E-01  1.155E+00  1.409E-06  1.005E-06  1.974E-06
Strike Probability, 1/yr               2.780E-06  1.713E-06  4.632E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     93.        80.       108.
1.0E-7 1/yr design speed                    139.       126.       153.
```

Appendix C

Results for 1° Boxes

Appendix C

Results for 1° Boxes

This appendix contains the detailed results of the analysis for the 1° boxes. The output for each box generally consists seven lines. However, if there were no tornado events in the box or the information for the tornado events was insufficient to perform an analysis, then there is only one line of output. The first line of output starts with the latitude and longitude of the southeast corner of the box. The next two entries in the line are the land area for the box assumed in the analysis and the fraction of the total box area assumed to be covered by land. The last three items in the first line are the number of total events observed and the number of events included in the calculation of expected values of area and length for events. For some boxes, this is the only line. Care should be taken when using strike probability and wind speed data from this appendix to ensure that the number of tornado events is sufficient to give reasonable results. As a minimum, there should be 10 events, and 20 or more events are desirable.

The second through seventh lines include the results of the calculations. Lines two and three contain the results of the strike probability calculations for the point structure and life-line terms, respectively. In line two, the first number is the expected area, in square miles, for tornado events for the box; the second and third numbers are the lower and upper limits of the 90 percent confidence interval for the expected area. The last three numbers are the expected strike probability for a point structure and the lower and upper limits for the strike probability confidence interval. The format for the information in the third line is similar to that for the second line. The first three numbers are the expected length, in miles, for the life-line term and the lower and upper limits on the expected length. The last three numbers are the additional strike probability for finite structures, assuming a characteristic dimension of 200 ft for the structure.

The fourth line gives the expected total strike probability for the box and the lower and upper bounds of 90 percent confidence interval. These values are the sums of the values direct above in lines two and three. Lines five through seven give the maximum wind speeds, in mile per hour, for 10^{-5} yr^{-1}, 10^{-6} yr^{-1}, and 10^{-7} yr^{-1} design criteria. As before, the first number is the expected value, and the second and third numbers are the lower and upper limits of the 90% confidence interval.

The lower limit for the maximum wind speed in a tornado is 65 mph. Two wind speeds less than 40 mph are used to provide information when the design wind speed would be less than 40 mph. A design wind speed of 50 mph indicates that the tornado strike probability for the box is less than 10^{-7} yr^{-1}. A design wind speed of 60 mph indicates that the design wind speed for the design probability specified at the beginning of the line is less than 65 mph, but that the design wind speed at the 10^{-7} yr^{-1} probability level exceeds 65 mph.

```
   25   80    3.017E+03 0.7000    135    115    115
Point  1.351E-01  6.332E-02  2.882E-01  1.126E-04  5.280E-05  2.403E-04
Line   2.019E+00  1.373E+00  2.970E+00  6.377E-05  4.336E-05  9.379E-05
Strike Probability, 1/yr                1.764E-04  9.616E-05  3.341E-04
1.0E-5 1/yr design speed                     132.       120.       143.
1.0E-6 1/yr design speed                     170.       159.       181.
1.0E-7 1/yr design speed                     204.       193.       215.

   25   81    1.293E+03 0.3000     13     11     11
Point  6.839E-03  3.909E-03  1.196E-02  1.281E-06  7.324E-07  2.242E-06
Line   4.393E-01  3.004E-01  6.426E-01  3.118E-06  2.132E-06  4.560E-06
Strike Probability, 1/yr                4.399E-06  2.864E-06  6.802E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                     109.        99.       119.
1.0E-7 1/yr design speed                     151.       143.       159.

   25   97    2.155E+02 0.0500      8      7      7
Point  2.460E-01  3.059E-02  1.978E+00  1.702E-04  2.116E-05  1.368E-03
Line   2.303E+00  8.142E-01  6.515E+00  6.035E-05  2.134E-05  1.707E-04
Strike Probability, 1/yr                2.305E-04  4.250E-05  1.539E-03
1.0E-5 1/yr design speed                     138.       109.       167.
1.0E-6 1/yr design speed                     176.       153.       203.
1.0E-7 1/yr design speed                     209.       188.       236.

   25   98    2.155E+02 0.0500      2      2      2
Point  5.388E-01  2.998E-01  9.683E-01  9.319E-05  5.185E-05  1.675E-04
Line   1.054E+00  5.863E-01  1.894E+00  6.903E-06  3.841E-06  1.240E-05
Strike Probability, 1/yr                1.001E-04  5.569E-05  1.799E-04
1.0E-5 1/yr design speed                     118.       107.       130.
1.0E-6 1/yr design speed                     158.       148.       169.
1.0E-7 1/yr design speed                     193.       183.       204.

   26   80    3.846E+03 0.9000    231    186    186
Point  3.372E-02  2.198E-02  5.174E-02  3.774E-05  2.460E-05  5.791E-05
Line   9.194E-01  7.394E-01  1.143E+00  3.898E-05  3.135E-05  4.847E-05
Strike Probability, 1/yr                7.672E-05  5.595E-05  1.064E-04
1.0E-5 1/yr design speed                     118.       111.       125.
1.0E-6 1/yr design speed                     158.       152.       164.
1.0E-7 1/yr design speed                     192.       186.       199.

   26   81    3.846E+03 0.9000    125    113    113
Point  3.562E-02  2.081E-02  6.099E-02  2.158E-05  1.260E-05  3.694E-05
Line   1.146E+00  8.511E-01  1.543E+00  2.629E-05  1.952E-05  3.540E-05
Strike Probability, 1/yr                4.787E-05  3.213E-05  7.234E-05
1.0E-5 1/yr design speed                     109.       100.       118.
1.0E-6 1/yr design speed                     151.       143.       158.
1.0E-7 1/yr design speed                     186.       178.       193.

   26   82    2.136E+02 0.0500     66     63     63
Point  3.294E-02  1.709E-02  6.351E-02  1.896E-04  9.835E-05  3.656E-04
Line   1.788E+00  1.148E+00  2.782E+00  3.898E-04  2.504E-04  6.066E-04
Strike Probability, 1/yr                5.794E-04  3.488E-04  9.722E-04
1.0E-5 1/yr design speed                     162.       153.       170.
1.0E-6 1/yr design speed                     197.       189.       205.
1.0E-7 1/yr design speed                     227.       220.       235.
```

```
   26   97    2.991E+03 0.7000     60     51     51
Point  6.972E-02  2.673E-02  1.818E-01  2.606E-05  9.992E-06  6.796E-05
Line   1.279E+00  7.675E-01  2.130E+00  1.810E-05  1.087E-05  3.016E-05
Strike Probability, 1/yr               4.416E-05  2.086E-05  9.812E-05
1.0E-5 1/yr design speed                    108.        91.       124.
1.0E-6 1/yr design speed                    153.       141.       165.
1.0E-7 1/yr design speed                    189.       178.       200.

   26   98    3.846E+03 0.9000     32     28     28
Point  9.910E-02  4.033E-02  2.435E-01  1.537E-05  6.253E-06  3.775E-05
Line   1.385E+00  8.178E-01  2.347E+00  8.136E-06  4.803E-06  1.378E-05
Strike Probability, 1/yr               2.350E-05  1.106E-05  5.154E-05
1.0E-5 1/yr design speed                     92.        70.       109.
1.0E-6 1/yr design speed                    140.       128.       153.
1.0E-7 1/yr design speed                    178.       167.       190.

   26   99    8.546E+02 0.2000      4      4      4
Point  1.140E-01  1.435E-02  9.051E-01  9.939E-06  1.251E-06  7.894E-05
Line   4.840E+00  5.973E-01  3.922E+01  1.599E-05  1.973E-06  1.296E-04
Strike Probability, 1/yr               2.593E-05  3.225E-06  2.085E-04
1.0E-5 1/yr design speed                     99.        60.       144.
1.0E-6 1/yr design speed                    147.       104.       182.
1.0E-7 1/yr design speed                    184.       151.       215.

   27   80    2.964E+03 0.7000    100     75     75
Point  4.082E-02  2.194E-02  7.595E-02  2.566E-05  1.379E-05  4.774E-05
Line   1.248E+00  8.493E-01  1.834E+00  2.971E-05  2.022E-05  4.367E-05
Strike Probability, 1/yr               5.537E-05  3.401E-05  9.141E-05
1.0E-5 1/yr design speed                    111.       101.       122.
1.0E-6 1/yr design speed                    153.       144.       162.
1.0E-7 1/yr design speed                    188.       179.       196.

   27   81    4.235E+03 1.0000    129    105    105
Point  3.848E-02  2.292E-02  6.460E-02  2.184E-05  1.301E-05  3.666E-05
Line   1.599E+00  1.162E+00  2.200E+00  3.437E-05  2.498E-05  4.729E-05
Strike Probability, 1/yr               5.621E-05  3.799E-05  8.396E-05
1.0E-5 1/yr design speed                    113.       104.       122.
1.0E-6 1/yr design speed                    154.       147.       161.
1.0E-7 1/yr design speed                    188.       181.       195.

   27   82    2.541E+03 0.6000    302    271    271
Point  6.241E-02  4.196E-02  9.282E-02  1.382E-04  9.292E-05  2.055E-04
Line   1.307E+00  1.067E+00  1.601E+00  1.096E-04  8.948E-05  1.343E-04
Strike Probability, 1/yr               2.478E-04  1.824E-04  3.399E-04
1.0E-5 1/yr design speed                    143.       138.       149.
1.0E-6 1/yr design speed                    181.       176.       186.
1.0E-7 1/yr design speed                    213.       208.       219.

   27   97    2.541E+03 0.6000    130    106    107
Point  4.706E-02  2.859E-02  7.747E-02  4.486E-05  2.725E-05  7.385E-05
Line   1.321E+00  9.757E-01  1.788E+00  4.769E-05  3.523E-05  6.455E-05
Strike Probability, 1/yr               9.255E-05  6.248E-05  1.384E-04
1.0E-5 1/yr design speed                    126.       118.       133.
1.0E-6 1/yr design speed                    167.       160.       173.
1.0E-7 1/yr design speed                    201.       195.       208.
```

```
   27   98    4.235E+03 1.0000     42     36     36
Point  5.384E-02  2.171E-02  1.336E-01  9.949E-06  4.011E-06  2.468E-05
Line   8.853E-01  5.704E-01  1.374E+00  6.197E-06  3.992E-06  9.619E-06
Strike Probability, 1/yr               1.615E-05  8.003E-06  3.430E-05
1.0E-5 1/yr design speed                     82.        60.       101.
1.0E-6 1/yr design speed                    134.       123.       146.
1.0E-7 1/yr design speed                    173.       163.       184.

   27   99    2.964E+03 0.7000      5      3      3
Point  7.736E-01  7.247E-03  8.258E+01  2.431E-05  2.277E-07  2.595E-03
Line   1.706E+00  5.472E-01  5.319E+00  2.031E-06  6.513E-07  6.332E-06
Strike Probability, 1/yr               2.634E-05  8.791E-07  2.601E-03
1.0E-5 1/yr design speed                     91.        60.       173.
1.0E-6 1/yr design speed                    136.        60.       208.
1.0E-7 1/yr design speed                    174.       128.       241.

   28   80    1.678E+03 0.4000    107     95     95
Point  1.488E-01  7.605E-02  2.911E-01  1.768E-04  9.034E-05  3.458E-04
Line   2.146E+00  1.455E+00  3.165E+00  9.656E-05  6.547E-05  1.424E-04
Strike Probability, 1/yr               2.733E-04  1.558E-04  4.882E-04
1.0E-5 1/yr design speed                    139.       129.       150.
1.0E-6 1/yr design speed                    176.       166.       187.
1.0E-7 1/yr design speed                    210.       200.       221.

   28   81    4.196E+03 1.0000    214    189    189
Point  1.431E-01  8.668E-02  2.362E-01  1.360E-04  8.237E-05  2.245E-04
Line   2.196E+00  1.658E+00  2.908E+00  7.903E-05  5.967E-05  1.047E-04
Strike Probability, 1/yr               2.150E-04  1.420E-04  3.292E-04
1.0E-5 1/yr design speed                    135.       127.       143.
1.0E-6 1/yr design speed                    173.       165.       181.
1.0E-7 1/yr design speed                    207.       199.       215.

   28   82    2.937E+03 0.7000    225    203    203
Point  8.607E-02  5.221E-02  1.419E-01  1.228E-04  7.453E-05  2.025E-04
Line   1.910E+00  1.453E+00  2.510E+00  1.033E-04  7.857E-05  1.357E-04
Strike Probability, 1/yr               2.261E-04  1.531E-04  3.382E-04
1.0E-5 1/yr design speed                    142.       135.       149.
1.0E-6 1/yr design speed                    180.       174.       186.
1.0E-7 1/yr design speed                    212.       206.       219.

   28   95    8.392E+02 0.2000     19     16     17
Point  6.724E-03  3.076E-03  1.470E-02  2.836E-06  1.298E-06  6.199E-06
Line   5.204E-01  3.011E-01  8.994E-01  8.315E-06  4.811E-06  1.437E-05
Strike Probability, 1/yr               1.115E-05  6.109E-06  2.057E-05
1.0E-5 1/yr design speed                     72.        60.        93.
1.0E-6 1/yr design speed                    133.       121.       145.
1.0E-7 1/yr design speed                    173.       163.       183.

   28   96    2.518E+03 0.6000     95     65     66
Point  5.537E-02  2.600E-02  1.179E-01  3.893E-05  1.828E-05  8.292E-05
Line   1.327E+00  8.551E-01  2.060E+00  3.534E-05  2.277E-05  5.485E-05
Strike Probability, 1/yr               7.428E-05  4.105E-05  1.378E-04
1.0E-5 1/yr design speed                    121.       109.       132.
1.0E-6 1/yr design speed                    162.       153.       172.
1.0E-7 1/yr design speed                    197.       189.       206.
```

```
   28   97    4.196E+03 1.0000    108     75     76
Point  8.060E-02  4.236E-02  1.534E-01  3.866E-05  2.032E-05  7.355E-05
Line   1.072E+00  7.962E-01  1.444E+00  1.948E-05  1.446E-05  2.623E-05
Strike Probability, 1/yr               5.813E-05  3.478E-05  9.978E-05
1.0E-5 1/yr design speed                    113.       103.       123.
1.0E-6 1/yr design speed                    156.       148.       164.
1.0E-7 1/yr design speed                    191.       184.       200.

   28   98    4.196E+03 1.0000     44     39     39
Point  4.295E-01  1.229E-01  1.501E+00  8.391E-05  2.402E-05  2.932E-04
Line   2.663E+00  1.474E+00  4.812E+00  1.971E-05  1.091E-05  3.562E-05
Strike Probability, 1/yr               1.036E-04  3.492E-05  3.288E-04
1.0E-5 1/yr design speed                    122.       102.       141.
1.0E-6 1/yr design speed                    162.       146.       179.
1.0E-7 1/yr design speed                    197.       182.       214.

   28   99    4.196E+03 1.0000     26     22     22
Point  4.662E-01  1.054E-01  2.062E+00  5.383E-05  1.217E-05  2.381E-04
Line   4.720E+00  2.074E+00  1.074E+01  2.064E-05  9.071E-06  4.697E-05
Strike Probability, 1/yr               7.447E-05  2.124E-05  2.851E-04
1.0E-5 1/yr design speed                    117.        90.       140.
1.0E-6 1/yr design speed                    159.       140.       179.
1.0E-7 1/yr design speed                    194.       177.       213.

   28  100    2.098E+03 0.5000      7      6      6
Point  2.797E+00  1.708E-02  4.579E+02  1.739E-04  1.062E-06  2.847E-02
Line   6.350E+00  7.503E-01  5.375E+01  1.495E-05  1.767E-06  1.266E-04
Strike Probability, 1/yr               1.888E-04  2.829E-06  2.859E-02
1.0E-5 1/yr design speed                    130.        60.       209.
1.0E-6 1/yr design speed                    168.       101.       243.
1.0E-7 1/yr design speed                    203.       148.       275.

   29   80    2.078E+02 0.0500     21     20     20
Point  1.167E-01  3.192E-02  4.268E-01  2.198E-04  6.011E-05  8.038E-04
Line   1.797E+00  9.047E-01  3.569E+00  1.282E-04  6.454E-05  2.546E-04
Strike Probability, 1/yr               3.480E-04  1.247E-04  1.058E-03
1.0E-5 1/yr design speed                    143.       126.       162.
1.0E-6 1/yr design speed                    180.       164.       198.
1.0E-7 1/yr design speed                    214.       197.       232.

   29   81    3.324E+03 0.8000    137    124    124
Point  1.042E-01  5.631E-02  1.929E-01  8.004E-05  4.324E-05  1.481E-04
Line   2.134E+00  1.502E+00  3.032E+00  6.207E-05  4.369E-05  8.818E-05
Strike Probability, 1/yr               1.421E-04  8.693E-05  2.363E-04
1.0E-5 1/yr design speed                    129.       119.       138.
1.0E-6 1/yr design speed                    167.       158.       176.
1.0E-7 1/yr design speed                    201.       192.       210.

   29   82    4.155E+03 1.0000    110     98     99
Point  1.311E-01  6.635E-02  2.589E-01  6.465E-05  3.272E-05  1.277E-04
Line   2.726E+00  1.830E+00  4.061E+00  5.094E-05  3.420E-05  7.587E-05
Strike Probability, 1/yr               1.156E-04  6.692E-05  2.036E-04
1.0E-5 1/yr design speed                    129.       119.       139.
1.0E-6 1/yr design speed                    169.       161.       178.
1.0E-7 1/yr design speed                    203.       195.       212.
```

```
   29   83    1.662E+03 0.4000      6      5      5
Point  2.969E-02  3.049E-03  2.891E-01  1.997E-06  2.051E-07  1.944E-05
Line   1.293E+00  3.491E-01  4.787E+00  3.294E-06  8.894E-07  1.220E-05
Strike Probability, 1/yr               5.290E-06  1.095E-06  3.164E-05
1.0E-5 1/yr design speed                     60.        60.       101.
1.0E-6 1/yr design speed                    116.        71.       147.
1.0E-7 1/yr design speed                    159.       133.       185.

   29   84    4.155E+02 0.1000     30     24     24
Point  4.038E-02  1.424E-02  1.145E-01  5.431E-05  1.916E-05  1.540E-04
Line   1.264E+00  6.146E-01  2.598E+00  6.439E-05  3.132E-05  1.324E-04
Strike Probability, 1/yr               1.187E-04  5.047E-05  2.864E-04
1.0E-5 1/yr design speed                    131.       114.       147.
1.0E-6 1/yr design speed                    171.       158.       184.
1.0E-7 1/yr design speed                    205.       193.       217.

   29   85    4.155E+02 0.1000     25     18     20
Point  1.003E-02  5.738E-03  1.754E-02  1.125E-05  6.433E-06  1.966E-05
Line   5.813E-01  3.895E-01  8.675E-01  2.468E-05  1.654E-05  3.684E-05
Strike Probability, 1/yr               3.593E-05  2.297E-05  5.650E-05
1.0E-5 1/yr design speed                    108.        97.       118.
1.0E-6 1/yr design speed                    154.       146.       162.
1.0E-7 1/yr design speed                    190.       183.       197.

   29   89    1.662E+03 0.4000     27     27     27
Point  5.199E-02  2.035E-02  1.328E-01  1.574E-05  6.159E-06  4.021E-05
Line   1.217E+00  6.935E-01  2.134E+00  1.395E-05  7.951E-06  2.447E-05
Strike Probability, 1/yr               2.968E-05  1.411E-05  6.467E-05
1.0E-5 1/yr design speed                    100.        80.       116.
1.0E-6 1/yr design speed                    147.       134.       159.
1.0E-7 1/yr design speed                    184.       173.       195.

   29   90    3.740E+03 0.9000     91     90     90
Point  5.396E-02  3.173E-02  9.177E-02  2.446E-05  1.438E-05  4.160E-05
Line   1.413E+00  1.015E+00  1.966E+00  2.426E-05  1.743E-05  3.376E-05
Strike Probability, 1/yr               4.872E-05  3.181E-05  7.537E-05
1.0E-5 1/yr design speed                    112.       103.       121.
1.0E-6 1/yr design speed                    156.       149.       163.
1.0E-7 1/yr design speed                    192.       185.       199.

   29   91    2.493E+03 0.6000     39     35     35
Point  1.184E-01  5.433E-02  2.581E-01  3.451E-05  1.583E-05  7.522E-05
Line   2.317E+00  1.466E+00  3.660E+00  2.558E-05  1.619E-05  4.041E-05
Strike Probability, 1/yr               6.009E-05  3.202E-05  1.156E-04
1.0E-5 1/yr design speed                    115.       103.       128.
1.0E-6 1/yr design speed                    158.       149.       168.
1.0E-7 1/yr design speed                    193.       184.       203.

   29   92    1.247E+03 0.3000     25     24     24
Point  2.652E-01  5.588E-02  1.258E+00  9.909E-05  2.088E-05  4.702E-04
Line   2.054E+00  1.118E+00  3.776E+00  2.908E-05  1.582E-05  5.344E-05
Strike Probability, 1/yr               1.282E-04  3.670E-05  5.237E-04
1.0E-5 1/yr design speed                    127.       104.       149.
1.0E-6 1/yr design speed                    166.       150.       186.
1.0E-7 1/yr design speed                    201.       185.       220.
```

```
   29   93    8.311E+02 0.2000     74     62     62
Point  8.245E-02  4.123E-02  1.649E-01  1.368E-04  6.839E-05  2.736E-04
Line   1.659E+00  1.124E+00  2.447E+00  1.042E-04  7.065E-05  1.538E-04
Strike Probability, 1/yr                2.410E-04  1.390E-04  4.273E-04
1.0E-5 1/yr design speed                     142.       133.       152.
1.0E-6 1/yr design speed                     180.       172.       189.
1.0E-7 1/yr design speed                     213.       205.       222.

   29   94    2.078E+03 0.5000    129    113    113
Point  1.031E-01  5.692E-02  1.866E-01  1.192E-04  6.585E-05  2.158E-04
Line   1.634E+00  1.194E+00  2.235E+00  7.159E-05  5.232E-05  9.795E-05
Strike Probability, 1/yr                1.908E-04  1.182E-04  3.138E-04
1.0E-5 1/yr design speed                     137.       129.       145.
1.0E-6 1/yr design speed                     176.       168.       183.
1.0E-7 1/yr design speed                     209.       202.       217.

   29   95    3.740E+03 0.9000    302    269    273
Point  1.831E-01  1.199E-01  2.794E-01  2.754E-04  1.804E-04  4.204E-04
Line   1.773E+00  1.445E+00  2.176E+00  1.010E-04  8.235E-05  1.240E-04
Strike Probability, 1/yr                3.765E-04  2.628E-04  5.444E-04
1.0E-5 1/yr design speed                     147.       141.       153.
1.0E-6 1/yr design speed                     184.       178.       190.
1.0E-7 1/yr design speed                     216.       210.       223.

   29   96    4.155E+03 1.0000    139    126    126
Point  8.722E-02  5.294E-02  1.437E-01  5.436E-05  3.300E-05  8.956E-05
Line   1.408E+00  1.075E+00  1.844E+00  3.324E-05  2.537E-05  4.354E-05
Strike Probability, 1/yr                8.760E-05  5.836E-05  1.331E-04
1.0E-5 1/yr design speed                     122.       115.       130.
1.0E-6 1/yr design speed                     163.       157.       170.
1.0E-7 1/yr design speed                     198.       192.       205.

   29   97    4.155E+03 1.0000     91     72     72
Point  2.342E-01  1.006E-01  5.453E-01  9.555E-05  4.103E-05  2.225E-04
Line   2.142E+00  1.408E+00  3.260E+00  3.311E-05  2.176E-05  5.038E-05
Strike Probability, 1/yr                1.287E-04  6.279E-05  2.729E-04
1.0E-5 1/yr design speed                     128.       115.       140.
1.0E-6 1/yr design speed                     167.       157.       178.
1.0E-7 1/yr design speed                     201.       191.       213.

   29   98    4.155E+03 1.0000    116    100    100
Point  2.582E-01  1.208E-01  5.517E-01  1.343E-04  6.284E-05  2.870E-04
Line   2.116E+00  1.457E+00  3.073E+00  4.169E-05  2.870E-05  6.054E-05
Strike Probability, 1/yr                1.760E-04  9.154E-05  3.475E-04
1.0E-5 1/yr design speed                     133.       122.       144.
1.0E-6 1/yr design speed                     171.       162.       182.
1.0E-7 1/yr design speed                     205.       196.       216.

   29   99    4.155E+03 1.0000     30     27     27
Point  7.955E-01  1.931E-01  3.277E+00  1.070E-04  2.598E-05  4.408E-04
Line   2.170E+00  1.295E+00  3.636E+00  1.106E-05  6.599E-06  1.853E-05
Strike Probability, 1/yr                1.181E-04  3.257E-05  4.593E-04
1.0E-5 1/yr design speed                     122.        98.       145.
1.0E-6 1/yr design speed                     161.       142.       183.
1.0E-7 1/yr design speed                     196.       179.       217.
```

```
   29  100    3.740E+03 0.9000     35     33     33
Point  5.088E-01  1.299E-01  1.994E+00  8.873E-05  2.265E-05  3.476E-04
Line   5.325E+00  2.438E+00  1.163E+01  3.517E-05  1.610E-05  7.682E-05
Strike Probability, 1/yr               1.239E-04  3.875E-05  4.245E-04
1.0E-5 1/yr design speed                    127.       105.       148.
1.0E-6 1/yr design speed                    167.       150.       185.
1.0E-7 1/yr design speed                    201.       186.       219.

   29  101    1.662E+03 0.4000     15     15     15
Point  8.227E-02  1.285E-02  5.265E-01  1.383E-05  2.161E-06  8.853E-05
Line   9.408E-01  4.183E-01  2.116E+00  5.992E-06  2.664E-06  1.348E-05
Strike Probability, 1/yr               1.982E-05  4.826E-06  1.020E-04
1.0E-5 1/yr design speed                     87.        60.       120.
1.0E-6 1/yr design speed                    136.       112.       161.
1.0E-7 1/yr design speed                    175.       156.       197.

   29  102    1.662E+03 0.4000      1      1      1
Point  1.136E-02  0.000E+00  0.000E+00  1.274E-07  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  8.492E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr               2.123E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                     60.        50.        50.
1.0E-7 1/yr design speed                     86.        50.        50.

   29  103    3.740E+03 0.9000      6      6      6
Point  3.897E-01  3.720E-02  4.082E+00  1.165E-05  1.112E-06  1.220E-04
Line   3.556E+00  9.620E-01  1.314E+01  4.026E-06  1.089E-06  1.488E-05
Strike Probability, 1/yr               1.568E-05  2.201E-06  1.369E-04
1.0E-5 1/yr design speed                     78.        60.       128.
1.0E-6 1/yr design speed                    127.        85.       169.
1.0E-7 1/yr design speed                    167.       130.       207.

   29  104    1.662E+03 0.4000      0      0      0

   30   81    2.468E+03 0.6000     90     71     71
Point  6.773E-02  3.333E-02  1.376E-01  4.602E-05  2.265E-05  9.351E-05
Line   1.712E+00  1.129E+00  2.594E+00  4.404E-05  2.906E-05  6.676E-05
Strike Probability, 1/yr               9.006E-05  5.170E-05  1.603E-04
1.0E-5 1/yr design speed                    121.       109.       132.
1.0E-6 1/yr design speed                    160.       151.       170.
1.0E-7 1/yr design speed                    194.       185.       204.

   30   82    4.114E+03 1.0000     64     60     60
Point  8.414E-02  3.876E-02  1.827E-01  2.439E-05  1.124E-05  5.295E-05
Line   2.613E+00  1.555E+00  4.390E+00  2.869E-05  1.708E-05  4.820E-05
Strike Probability, 1/yr               5.308E-05  2.831E-05  1.012E-04
1.0E-5 1/yr design speed                    114.       101.       127.
1.0E-6 1/yr design speed                    158.       148.       168.
1.0E-7 1/yr design speed                    193.       184.       203.
```

```
   30   83    4.114E+03 1.0000     73     66     66
Point  2.298E-01  1.073E-01  4.921E-01  7.599E-05  3.549E-05  1.627E-04
Line   3.279E+00  2.051E+00  5.244E+00  4.107E-05  2.568E-05  6.568E-05
Strike Probability, 1/yr               1.171E-04  6.117E-05  2.284E-04
1.0E-5 1/yr design speed                    128.       115.       139.
1.0E-6 1/yr design speed                    167.       158.       178.
1.0E-7 1/yr design speed                    202.       192.       212.

   30   84    4.114E+03 1.0000     83     73     74
Point  1.754E-01  8.524E-02  3.608E-01  6.592E-05  3.204E-05  1.356E-04
Line   1.871E+00  1.297E+00  2.699E+00  2.664E-05  1.847E-05  3.843E-05
Strike Probability, 1/yr               9.257E-05  5.051E-05  1.741E-04
1.0E-5 1/yr design speed                    122.       110.       133.
1.0E-6 1/yr design speed                    162.       153.       172.
1.0E-7 1/yr design speed                    197.       188.       207.

   30   85    3.702E+03 0.9000    137    119    119
Point  2.111E-01  1.157E-01  3.851E-01  1.455E-04  7.978E-05  2.655E-04
Line   2.834E+00  2.002E+00  4.013E+00  7.402E-05  5.228E-05  1.048E-04
Strike Probability, 1/yr               2.196E-04  1.321E-04  3.703E-04
1.0E-5 1/yr design speed                    139.       130.       148.
1.0E-6 1/yr design speed                    177.       169.       185.
1.0E-7 1/yr design speed                    210.       202.       219.

   30   86    2.880E+03 0.7000    132    116    118
Point  5.284E-02  3.206E-02  8.708E-02  4.513E-05  2.738E-05  7.437E-05
Line   1.493E+00  1.070E+00  2.085E+00  4.831E-05  3.461E-05  6.745E-05
Strike Probability, 1/yr               9.344E-05  6.199E-05  1.418E-04
1.0E-5 1/yr design speed                    126.       118.       134.
1.0E-6 1/yr design speed                    167.       160.       174.
1.0E-7 1/yr design speed                    201.       195.       208.

   30   87    2.880E+03 0.7000    179    148    148
Point  1.154E-01  6.607E-02  2.017E-01  1.337E-04  7.652E-05  2.337E-04
Line   1.614E+00  1.204E+00  2.164E+00  7.080E-05  5.281E-05  9.492E-05
Strike Probability, 1/yr               2.045E-04  1.293E-04  3.286E-04
1.0E-5 1/yr design speed                    138.       130.       146.
1.0E-6 1/yr design speed                    176.       169.       183.
1.0E-7 1/yr design speed                    209.       202.       217.

   30   88    2.468E+03 0.6000    124    102    102
Point  2.526E-01  1.245E-01  5.125E-01  2.364E-04  1.166E-04  4.797E-04
Line   2.471E+00  1.662E+00  3.674E+00  8.762E-05  5.894E-05  1.303E-04
Strike Probability, 1/yr               3.241E-04  1.755E-04  6.099E-04
1.0E-5 1/yr design speed                    144.       134.       155.
1.0E-6 1/yr design speed                    181.       173.       191.
1.0E-7 1/yr design speed                    214.       205.       225.

   30   89    3.291E+03 0.8000    163    138    138
Point  2.427E-01  1.349E-01  4.364E-01  2.240E-04  1.245E-04  4.028E-04
Line   2.950E+00  2.121E+00  4.102E+00  1.031E-04  7.415E-05  1.434E-04
Strike Probability, 1/yr               3.271E-04  1.987E-04  5.462E-04
1.0E-5 1/yr design speed                    146.       137.       154.
1.0E-6 1/yr design speed                    183.       175.       191.
1.0E-7 1/yr design speed                    215.       207.       224.
```

```
   30   90    4.114E+03 1.0000    136    128    128
Point  2.027E-01  1.195E-01  3.437E-01  1.248E-04  7.363E-05  2.117E-04
Line   2.629E+00  1.943E+00  3.557E+00  6.134E-05  4.534E-05  8.300E-05
Strike Probability, 1/yr                1.862E-04  1.190E-04  2.947E-04
1.0E-5 1/yr design speed                     136.       128.       144.
1.0E-6 1/yr design speed                     174.       167.       182.
1.0E-7 1/yr design speed                     208.       201.       215.

   30   91    4.114E+03 1.0000    130    123    123
Point  3.105E-01  1.819E-01  5.299E-01  1.828E-04  1.071E-04  3.120E-04
Line   3.332E+00  2.514E+00  4.416E+00  7.432E-05  5.608E-05  9.849E-05
Strike Probability, 1/yr                2.571E-04  1.632E-04  4.105E-04
1.0E-5 1/yr design speed                     141.       133.       149.
1.0E-6 1/yr design speed                     178.       172.       186.
1.0E-7 1/yr design speed                     211.       204.       219.

   30   92    4.114E+03 1.0000    202    194    194
Point  2.188E-01  1.421E-01  3.369E-01  2.001E-04  1.300E-04  3.082E-04
Line   3.021E+00  2.394E+00  3.812E+00  1.047E-04  8.298E-05  1.321E-04
Strike Probability, 1/yr                3.048E-04  2.129E-04  4.403E-04
1.0E-5 1/yr design speed                     145.       139.       151.
1.0E-6 1/yr design speed                     182.       177.       188.
1.0E-7 1/yr design speed                     215.       209.       221.

   30   93    4.114E+03 1.0000    154    149    149
Point  1.801E-01  1.125E-01  2.885E-01  1.256E-04  7.845E-05  2.012E-04
Line   2.710E+00  2.105E+00  3.490E+00  7.161E-05  5.562E-05  9.220E-05
Strike Probability, 1/yr                1.973E-04  1.341E-04  2.934E-04
1.0E-5 1/yr design speed                     137.       131.       144.
1.0E-6 1/yr design speed                     176.       170.       182.
1.0E-7 1/yr design speed                     209.       203.       216.

   30   94    4.114E+03 1.0000    134    114    114
Point  3.747E-01  1.785E-01  7.865E-01  2.274E-04  1.083E-04  4.773E-04
Line   3.394E+00  2.302E+00  5.003E+00  7.802E-05  5.293E-05  1.150E-04
Strike Probability, 1/yr                3.054E-04  1.613E-04  5.924E-04
1.0E-5 1/yr design speed                     143.       133.       154.
1.0E-6 1/yr design speed                     180.       171.       190.
1.0E-7 1/yr design speed                     213.       204.       224.

   30   95    4.114E+03 1.0000    113    106    106
Point  3.376E-01  1.582E-01  7.205E-01  1.728E-04  8.098E-05  3.688E-04
Line   2.422E+00  1.726E+00  3.398E+00  4.696E-05  3.347E-05  6.588E-05
Strike Probability, 1/yr                2.198E-04  1.144E-04  4.346E-04
1.0E-5 1/yr design speed                     136.       126.       148.
1.0E-6 1/yr design speed                     174.       165.       185.
1.0E-7 1/yr design speed                     208.       199.       219.

   30   96    4.114E+03 1.0000    114    106    106
Point  1.390E+00  5.840E-01  3.310E+00  7.179E-04  3.016E-04  1.709E-03
Line   5.684E+00  3.757E+00  8.599E+00  1.112E-04  7.349E-05  1.682E-04
Strike Probability, 1/yr                8.291E-04  3.750E-04  1.877E-03
1.0E-5 1/yr design speed                     157.       145.       170.
1.0E-6 1/yr design speed                     192.       181.       205.
1.0E-7 1/yr design speed                     224.       212.       238.
```

```
   30   97    4.114E+03 1.0000    155    145    145
Point  1.102E+00  5.187E-01  2.339E+00  7.733E-04  3.641E-04  1.642E-03
Line   4.973E+00  3.449E+00  7.172E+00  1.323E-04  9.171E-05  1.907E-04
Strike Probability, 1/yr                9.056E-04  4.559E-04  1.833E-03
1.0E-5 1/yr design speed                     159.       148.       170.
1.0E-6 1/yr design speed                     194.       183.       205.
1.0E-7 1/yr design speed                     226.       215.       238.

   30   98    4.114E+03 1.0000     66     59     59
Point  4.951E-01  2.085E-01  1.176E+00  1.480E-04  6.232E-05  3.514E-04
Line   3.790E+00  2.443E+00  5.879E+00  4.291E-05  2.766E-05  6.657E-05
Strike Probability, 1/yr                1.909E-04  8.998E-05  4.180E-04
1.0E-5 1/yr design speed                     134.       121.       147.
1.0E-6 1/yr design speed                     172.       161.       184.
1.0E-7 1/yr design speed                     206.       196.       218.

   30   99    4.114E+03 1.0000     19     15     15
Point  2.344E+00  9.991E-02  5.500E+01  2.017E-04  8.598E-06  4.733E-03
Line   3.056E+00  9.154E-01  1.020E+01  9.960E-06  2.984E-06  3.325E-05
Strike Probability, 1/yr                2.117E-04  1.158E-05  4.766E-03
1.0E-5 1/yr design speed                     131.        71.       182.
1.0E-6 1/yr design speed                     169.       125.       217.
1.0E-7 1/yr design speed                     203.       164.       250.

   30  100    4.114E+03 1.0000     16     16     16
Point  9.034E-02  1.415E-02  5.769E-01  6.547E-06  1.025E-06  4.181E-05
Line   1.725E+00  6.012E-01  4.951E+00  4.736E-06  1.650E-06  1.359E-05
Strike Probability, 1/yr                1.128E-05  2.675E-06  5.540E-05
1.0E-5 1/yr design speed                      71.        60.       110.
1.0E-6 1/yr design speed                     128.       100.       154.
1.0E-7 1/yr design speed                     168.       147.       191.

   30  101    4.114E+03 1.0000     14     14     14
Point  1.664E-01  2.682E-02  1.032E+00  1.055E-05  1.701E-06  6.544E-05
Line   1.187E+00  5.261E-01  2.677E+00  2.850E-06  1.264E-06  6.430E-06
Strike Probability, 1/yr                1.340E-05  2.964E-06  7.187E-05
1.0E-5 1/yr design speed                      76.        60.       112.
1.0E-6 1/yr design speed                     127.       100.       154.
1.0E-7 1/yr design speed                     167.       146.       191.

   30  102    4.114E+03 1.0000     30     29     29
Point  5.608E-01  1.280E-01  2.457E+00  7.620E-05  1.739E-05  3.338E-04
Line   2.754E+00  1.301E+00  5.830E+00  1.417E-05  6.696E-06  3.001E-05
Strike Probability, 1/yr                9.037E-05  2.409E-05  3.638E-04
1.0E-5 1/yr design speed                     116.        86.       146.
1.0E-6 1/yr design speed                     157.       130.       185.
1.0E-7 1/yr design speed                     195.       168.       222.

   30  103    4.114E+03 1.0000     29     27     27
Point  1.927E-01  5.241E-02  7.087E-01  2.531E-05  6.883E-06  9.308E-05
Line   1.899E+00  1.041E+00  3.464E+00  9.449E-06  5.180E-06  1.723E-05
Strike Probability, 1/yr                3.476E-05  1.206E-05  1.103E-04
1.0E-5 1/yr design speed                      97.        70.       124.
1.0E-6 1/yr design speed                     141.       119.       166.
1.0E-7 1/yr design speed                     180.       158.       204.
```

```
   30  104    3.702E+03 0.9000     10      6      6
Point  2.428E-02  5.625E-03  1.048E-01  1.222E-06  2.831E-07  5.274E-06
Line   3.607E-01  2.315E-01  5.621E-01  6.876E-07  4.412E-07  1.071E-06
Strike Probability, 1/yr                1.909E-06  7.243E-07  6.345E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      83.        60.       113.
1.0E-7 1/yr design speed                     131.       110.       157.

   30  105    4.114E+02 0.1000      0      0      0
Point  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
Line   0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
Strike Probability, 1/yr                0.000E+00  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                       0.         0.         0.
1.0E-6 1/yr design speed                       0.         0.         0.
1.0E-7 1/yr design speed                       0.         0.         0.

   31   80    2.035E+02 0.0500      0      0      0

   31   81    3.257E+03 0.8000     43     40     41
Point  4.659E-01  1.282E-01  1.693E+00  1.146E-04  3.154E-05  4.164E-04
Line   3.036E+00  1.542E+00  5.981E+00  2.830E-05  1.437E-05  5.573E-05
Strike Probability, 1/yr                1.429E-04  4.591E-05  4.721E-04
1.0E-5 1/yr design speed                     126.       104.       147.
1.0E-6 1/yr design speed                     165.       146.       185.
1.0E-7 1/yr design speed                     201.       182.       221.

   31   82    4.071E+03 1.0000     80     75     78
Point  7.192E-01  2.511E-01  2.060E+00  2.633E-04  9.194E-05  7.542E-04
Line   4.657E+00  2.672E+00  8.117E+00  6.459E-05  3.706E-05  1.126E-04
Strike Probability, 1/yr                3.279E-04  1.290E-04  8.667E-04
1.0E-5 1/yr design speed                     143.       128.       158.
1.0E-6 1/yr design speed                     180.       167.       195.
1.0E-7 1/yr design speed                     213.       200.       228.

   31   83    4.071E+03 1.0000    123    120    120
Point  7.326E-01  4.100E-01  1.309E+00  4.124E-04  2.308E-04  7.370E-04
Line   5.685E+00  4.039E+00  8.003E+00  1.212E-04  8.612E-05  1.707E-04
Strike Probability, 1/yr                5.337E-04  3.169E-04  9.076E-04
1.0E-5 1/yr design speed                     152.       143.       161.
1.0E-6 1/yr design speed                     188.       180.       197.
1.0E-7 1/yr design speed                     220.       212.       230.

   31   84    4.071E+03 1.0000    109    103    103
Point  6.905E-01  3.755E-01  1.270E+00  3.445E-04  1.873E-04  6.335E-04
Line   4.296E+00  3.045E+00  6.060E+00  8.117E-05  5.754E-05  1.145E-04
Strike Probability, 1/yr                4.257E-04  2.449E-04  7.480E-04
1.0E-5 1/yr design speed                     147.       138.       157.
1.0E-6 1/yr design speed                     184.       175.       193.
1.0E-7 1/yr design speed                     216.       208.       226.

   31   85    4.071E+03 1.0000    128    110    113
Point  7.024E-01  4.203E-01  1.174E+00  4.115E-04  2.462E-04  6.876E-04
Line   6.791E+00  4.860E+00  9.490E+00  1.507E-04  1.078E-04  2.106E-04
Strike Probability, 1/yr                5.622E-04  3.541E-04  8.982E-04
1.0E-5 1/yr design speed                     154.       146.       162.
1.0E-6 1/yr design speed                     190.       182.       198.
1.0E-7 1/yr design speed                     222.       214.       230.
```

```
   31   86    4.071E+03 1.0000     98     84     84
Point  6.408E-01  2.950E-01  1.392E+00  2.874E-04  1.323E-04  6.244E-04
Line   5.192E+00  3.266E+00  8.254E+00  8.821E-05  5.549E-05  1.402E-04
Strike Probability, 1/yr               3.756E-04  1.878E-04  7.646E-04
1.0E-5 1/yr design speed                    146.       135.       158.
1.0E-6 1/yr design speed                    183.       173.       194.
1.0E-7 1/yr design speed                    216.       205.       227.

   31   87    4.071E+03 1.0000     74     67     67
Point  1.226E+00  4.205E-01  3.574E+00  4.152E-04  1.424E-04  1.211E-03
Line   7.666E+00  4.174E+00  1.408E+01  9.835E-05  5.355E-05  1.806E-04
Strike Probability, 1/yr               5.136E-04  1.960E-04  1.391E-03
1.0E-5 1/yr design speed                    151.       135.       166.
1.0E-6 1/yr design speed                    186.       173.       202.
1.0E-7 1/yr design speed                    219.       205.       235.

   31   88    4.071E+03 1.0000     73     67     67
Point  4.613E+00  1.319E+00  1.613E+01  1.541E-03  4.407E-04  5.390E-03
Line   9.499E+00  5.148E+00  1.753E+01  1.202E-04  6.515E-05  2.219E-04
Strike Probability, 1/yr               1.661E-03  5.058E-04  5.612E-03
1.0E-5 1/yr design speed                    166.       148.       186.
1.0E-6 1/yr design speed                    201.       183.       220.
1.0E-7 1/yr design speed                    233.       215.       253.

   31   89    4.071E+03 1.0000    183    158    158
Point  1.134E+00  7.157E-01  1.796E+00  9.495E-04  5.994E-04  1.504E-03
Line   7.052E+00  5.481E+00  9.073E+00  2.237E-04  1.739E-04  2.879E-04
Strike Probability, 1/yr               1.173E-03  7.733E-04  1.792E-03
1.0E-5 1/yr design speed                    164.       157.       171.
1.0E-6 1/yr design speed                    199.       192.       206.
1.0E-7 1/yr design speed                    230.       223.       238.

   31   90    4.071E+03 1.0000    139    128    128
Point  1.186E+00  6.985E-01  2.012E+00  7.543E-04  4.444E-04  1.280E-03
Line   6.397E+00  4.866E+00  8.410E+00  1.542E-04  1.173E-04  2.027E-04
Strike Probability, 1/yr               9.084E-04  5.616E-04  1.483E-03
1.0E-5 1/yr design speed                    159.       152.       167.
1.0E-6 1/yr design speed                    194.       187.       203.
1.0E-7 1/yr design speed                    226.       218.       236.

   31   91    4.071E+03 1.0000     91     86     86
Point  5.296E-01  2.837E-01  9.888E-01  2.206E-04  1.182E-04  4.118E-04
Line   4.604E+00  3.266E+00  6.492E+00  7.264E-05  5.152E-05  1.024E-04
Strike Probability, 1/yr               2.932E-04  1.697E-04  5.143E-04
1.0E-5 1/yr design speed                    142.       133.       152.
1.0E-6 1/yr design speed                    180.       171.       188.
1.0E-7 1/yr design speed                    212.       204.       222.

   31   92    4.071E+03 1.0000     94     93     93
Point  1.493E+00  6.397E-01  3.485E+00  6.424E-04  2.752E-04  1.499E-03
Line   6.745E+00  4.560E+00  9.976E+00  1.099E-04  7.432E-05  1.626E-04
Strike Probability, 1/yr               7.523E-04  3.496E-04  1.662E-03
1.0E-5 1/yr design speed                    156.       144.       168.
1.0E-6 1/yr design speed                    191.       180.       204.
1.0E-7 1/yr design speed                    223.       212.       237.
```

```
   31   93    4.071E+03 1.0000     90     84     84
Point  4.425E-01  2.498E-01  7.841E-01  1.823E-04  1.029E-04  3.230E-04
Line   5.409E+00  3.902E+00  7.499E+00  8.440E-05  6.088E-05  1.170E-04
Strike Probability, 1/yr               2.667E-04  1.638E-04  4.400E-04
1.0E-5 1/yr design speed                    142.       134.       151.
1.0E-6 1/yr design speed                    180.       172.       187.
1.0E-7 1/yr design speed                    212.       205.       221.

   31   94    4.071E+03 1.0000    139    122    122
Point  2.986E+00  1.193E+00  7.472E+00  1.900E-03  7.591E-04  4.753E-03
Line   7.622E+00  5.116E+00  1.135E+01  1.837E-04  1.233E-04  2.736E-04
Strike Probability, 1/yr               2.083E-03  8.824E-04  5.027E-03
1.0E-5 1/yr design speed                    170.       157.       184.
1.0E-6 1/yr design speed                    204.       191.       219.
1.0E-7 1/yr design speed                    236.       223.       251.

   31   95    4.071E+03 1.0000     82     68     70
Point  1.054E+00  3.337E-01  3.330E+00  3.957E-04  1.253E-04  1.250E-03
Line   3.948E+00  2.388E+00  6.526E+00  5.613E-05  3.396E-05  9.278E-05
Strike Probability, 1/yr               4.518E-04  1.592E-04  1.343E-03
1.0E-5 1/yr design speed                    147.       130.       164.
1.0E-6 1/yr design speed                    183.       168.       200.
1.0E-7 1/yr design speed                    216.       201.       233.

   31   96    4.071E+03 1.0000     65     58     58
Point  8.906E-01  2.412E-01  3.288E+00  2.650E-04  7.176E-05  9.783E-04
Line   3.133E+00  1.812E+00  5.415E+00  3.530E-05  2.042E-05  6.102E-05
Strike Probability, 1/yr               3.003E-04  9.219E-05  1.039E-03
1.0E-5 1/yr design speed                    139.       120.       159.
1.0E-6 1/yr design speed                    177.       160.       196.
1.0E-7 1/yr design speed                    210.       194.       229.

   31   97    4.071E+03 1.0000    158    137    138
Point  2.350E-01  1.242E-01  4.447E-01  1.699E-04  8.981E-05  3.216E-04
Line   2.282E+00  1.647E+00  3.162E+00  6.252E-05  4.512E-05  8.662E-05
Strike Probability, 1/yr               2.325E-04  1.349E-04  4.082E-04
1.0E-5 1/yr design speed                    138.       130.       148.
1.0E-6 1/yr design speed                    177.       168.       185.
1.0E-7 1/yr design speed                    210.       202.       219.

   31   98    4.071E+03 1.0000     81     65     67
Point  6.454E-01  1.930E-01  2.159E+00  2.393E-04  7.153E-05  8.003E-04
Line   2.760E+00  1.656E+00  4.600E+00  3.876E-05  2.326E-05  6.460E-05
Strike Probability, 1/yr               2.780E-04  9.479E-05  8.649E-04
1.0E-5 1/yr design speed                    138.       121.       157.
1.0E-6 1/yr design speed                    176.       161.       193.
1.0E-7 1/yr design speed                    209.       195.       227.

   31   99    4.071E+03 1.0000     92     80     80
Point  3.700E-01  1.443E-01  9.487E-01  1.558E-04  6.076E-05  3.995E-04
Line   2.141E+00  1.424E+00  3.219E+00  3.415E-05  2.271E-05  5.134E-05
Strike Probability, 1/yr               1.899E-04  8.348E-05  4.508E-04
1.0E-5 1/yr design speed                    133.       119.       147.
1.0E-6 1/yr design speed                    171.       159.       184.
1.0E-7 1/yr design speed                    205.       194.       218.
```

```
   31  100    4.071E+03 1.0000     85     78     79
Point  2.049E-01  9.077E-02  4.625E-01  7.972E-05  3.531E-05  1.799E-04
Line   1.875E+00  1.253E+00  2.807E+00  2.764E-05  1.847E-05  4.136E-05
Strike Probability, 1/yr               1.074E-04  5.378E-05  2.213E-04
1.0E-5 1/yr design speed                    124.       111.       136.
1.0E-6 1/yr design speed                    164.       154.       175.
1.0E-7 1/yr design speed                    199.       189.       210.

   31  101    4.071E+03 1.0000     35     34     34
Point  2.422E-01  6.374E-02  9.207E-01  3.881E-05  1.021E-05  1.475E-04
Line   1.672E+00  9.158E-01  3.051E+00  1.014E-05  5.557E-06  1.851E-05
Strike Probability, 1/yr               4.895E-05  1.577E-05  1.660E-04
1.0E-5 1/yr design speed                    107.        81.       129.
1.0E-6 1/yr design speed                    150.       133.       169.
1.0E-7 1/yr design speed                    186.       171.       204.

   31  102    4.071E+03 1.0000     89     75     75
Point  1.914E-01  8.968E-02  4.084E-01  7.796E-05  3.653E-05  1.664E-04
Line   2.055E+00  1.385E+00  3.048E+00  3.171E-05  2.138E-05  4.704E-05
Strike Probability, 1/yr               1.097E-04  5.791E-05  2.134E-04
1.0E-5 1/yr design speed                    120.       104.       137.
1.0E-6 1/yr design speed                    161.       146.       178.
1.0E-7 1/yr design speed                    199.       183.       214.

   31  103    4.071E+03 1.0000     49     42     42
Point  1.843E-01  8.727E-02  3.891E-01  4.133E-05  1.957E-05  8.727E-05
Line   2.080E+00  1.384E+00  3.126E+00  1.767E-05  1.176E-05  2.656E-05
Strike Probability, 1/yr               5.900E-05  3.133E-05  1.138E-04
1.0E-5 1/yr design speed                    108.        92.       126.
1.0E-6 1/yr design speed                    151.       135.       167.
1.0E-7 1/yr design speed                    189.       173.       205.

   31  104    4.071E+03 1.0000      6      6      6
Point  8.463E-02  6.662E-03  1.075E+00  2.324E-06  1.830E-07  2.952E-05
Line   1.879E+00  2.969E-01  1.189E+01  1.954E-06  3.089E-07  1.236E-05
Strike Probability, 1/yr               4.278E-06  4.918E-07  4.189E-05
1.0E-5 1/yr design speed                     60.        60.       105.
1.0E-6 1/yr design speed                    103.        60.       150.
1.0E-7 1/yr design speed                    147.       103.       189.

   31  105    3.664E+03 0.9000      8      6      6
Point  1.102E+00  6.191E-02  1.961E+01  4.482E-05  2.519E-06  7.977E-04
Line   5.283E+00  1.796E+00  1.554E+01  8.142E-06  2.768E-06  2.395E-05
Strike Probability, 1/yr               5.297E-05  5.286E-06  8.217E-04
1.0E-5 1/yr design speed                    105.        60.       160.
1.0E-6 1/yr design speed                    148.       104.       198.
1.0E-7 1/yr design speed                    186.       145.       234.

   31  106    1.221E+03 0.3000      6      5      5
Point  5.535E-02  1.623E-02  1.888E-01  5.067E-06  1.486E-06  1.728E-05
Line   9.248E-01  4.678E-01  1.828E+00  3.207E-06  1.622E-06  6.339E-06
Strike Probability, 1/yr               8.274E-06  3.108E-06  2.362E-05
1.0E-5 1/yr design speed                     60.        60.        91.
1.0E-6 1/yr design speed                    115.        93.       139.
1.0E-7 1/yr design speed                    157.       136.       180.
```

```
   31  107    8.142E+02 0.2000      1      0      0

   31  108    2.035E+03 0.5000      1      1      1
Point  1.591E-01  0.000E+00  0.000E+00  1.456E-06  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  3.467E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.803E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      81.        50.        50.
1.0E-7 1/yr design speed                     129.        50.        50.

   31  109    2.850E+03 0.7000      4      3      3
Point  5.475E-02  2.261E-03  1.326E+00  1.432E-06  5.914E-08  3.468E-05
Line   7.798E-01  3.293E-01  1.847E+00  7.726E-07  3.262E-07  1.830E-06
Strike Probability, 1/yr                2.205E-06  3.853E-07  3.651E-05
1.0E-5 1/yr design speed                      60.        60.       101.
1.0E-6 1/yr design speed                      87.        60.       146.
1.0E-7 1/yr design speed                     134.       100.       185.

   31  110    3.257E+03 0.8000      6      3      3
Point  7.089E-03  4.631E-04  1.085E-01  2.434E-07  1.590E-08  3.725E-06
Line   3.883E-01  9.434E-02  1.598E+00  5.049E-07  1.227E-07  2.078E-06
Strike Probability, 1/yr                7.483E-07  1.386E-07  5.803E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.       112.
1.0E-7 1/yr design speed                     115.        76.       156.

   31  111    2.035E+03 0.5000      1      1      1
Point  8.523E-03  0.000E+00  0.000E+00  7.802E-08  0.000E+00  0.000E+00
Line   5.000E-01  0.000E+00  0.000E+00  1.734E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.514E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      92.        50.        50.

   31  112    8.142E+02 0.2000      0      0      0

   31  113    2.035E+02 0.0500      0      0      0

   32   79    4.027E+02 0.1000     16     15     15
Point  4.647E-02  1.371E-02  1.575E-01  3.440E-05  1.015E-05  1.166E-04
Line   1.691E+00  7.563E-01  3.780E+00  4.742E-05  2.121E-05  1.060E-04
Strike Probability, 1/yr                8.182E-05  3.136E-05  2.226E-04
1.0E-5 1/yr design speed                     120.       100.       139.
1.0E-6 1/yr design speed                     160.       143.       176.
1.0E-7 1/yr design speed                     193.       178.       209.

   32   80    3.221E+03 0.8000     37     35     35
Point  9.380E-02  4.480E-02  1.964E-01  2.007E-05  9.588E-06  4.203E-05
Line   1.671E+00  1.081E+00  2.584E+00  1.355E-05  8.760E-06  2.095E-05
Strike Probability, 1/yr                3.362E-05  1.835E-05  6.297E-05
1.0E-5 1/yr design speed                      99.        84.       113.
1.0E-6 1/yr design speed                     143.       132.       155.
1.0E-7 1/yr design speed                     180.       169.       191.
```

```
   32   81    4.027E+03 1.0000     70     67     67
Point  2.792E-01  1.495E-01  5.213E-01  9.042E-05  4.842E-05  1.688E-04
Line   3.183E+00  2.257E+00  4.489E+00  3.905E-05  2.770E-05  5.507E-05
Strike Probability, 1/yr               1.295E-04  7.612E-05  2.239E-04
1.0E-5 1/yr design speed                   125.       114.       136.
1.0E-6 1/yr design speed                   164.       155.       174.
1.0E-7 1/yr design speed                   199.       190.       209.

   32   82    4.027E+03 1.0000     51     47     47
Point  3.156E-01  1.416E-01  7.037E-01  7.448E-05  3.341E-05  1.661E-04
Line   3.056E+00  1.955E+00  4.776E+00  2.732E-05  1.748E-05  4.269E-05
Strike Probability, 1/yr               1.018E-04  5.089E-05  2.088E-04
1.0E-5 1/yr design speed                   123.       110.       136.
1.0E-6 1/yr design speed                   163.       153.       175.
1.0E-7 1/yr design speed                   198.       188.       209.

   32   83    4.027E+03 1.0000    101     99     99
Point  5.899E-01  3.285E-01  1.059E+00  2.757E-04  1.535E-04  4.950E-04
Line   3.884E+00  2.869E+00  5.257E+00  6.875E-05  5.079E-05  9.306E-05
Strike Probability, 1/yr               3.444E-04  2.043E-04  5.881E-04
1.0E-5 1/yr design speed                   144.       135.       153.
1.0E-6 1/yr design speed                   181.       173.       190.
1.0E-7 1/yr design speed                   214.       206.       223.

   32   84    4.027E+03 1.0000    102    100    100
Point  5.281E-01  3.034E-01  9.190E-01  2.492E-04  1.432E-04  4.338E-04
Line   4.287E+00  3.098E+00  5.932E+00  7.664E-05  5.539E-05  1.061E-04
Strike Probability, 1/yr               3.259E-04  1.986E-04  5.398E-04
1.0E-5 1/yr design speed                   144.       135.       152.
1.0E-6 1/yr design speed                   181.       173.       189.
1.0E-7 1/yr design speed                   214.       206.       223.

   32   85    4.027E+03 1.0000     78     65     65
Point  7.228E-01  3.256E-01  1.604E+00  2.609E-04  1.175E-04  5.791E-04
Line   6.016E+00  3.739E+00  9.679E+00  8.224E-05  5.111E-05  1.323E-04
Strike Probability, 1/yr               3.431E-04  1.686E-04  7.114E-04
1.0E-5 1/yr design speed                   145.       133.       157.
1.0E-6 1/yr design speed                   182.       171.       193.
1.0E-7 1/yr design speed                   214.       204.       226.

   32   86    4.027E+03 1.0000     97     89     89
Point  1.584E+00  7.033E-01  3.567E+00  7.109E-04  3.156E-04  1.601E-03
Line   7.621E+00  4.963E+00  1.170E+01  1.296E-04  8.437E-05  1.990E-04
Strike Probability, 1/yr               8.405E-04  4.000E-04  1.800E-03
1.0E-5 1/yr design speed                   158.       146.       170.
1.0E-6 1/yr design speed                   193.       182.       205.
1.0E-7 1/yr design speed                   225.       214.       238.

   32   87    4.027E+03 1.0000     70     69     69
Point  1.175E+00  4.666E-01  2.960E+00  3.807E-04  1.511E-04  9.588E-04
Line   6.585E+00  3.878E+00  1.118E+01  8.079E-05  4.757E-05  1.372E-04
Strike Probability, 1/yr               4.614E-04  1.987E-04  1.096E-03
1.0E-5 1/yr design speed                   148.       134.       162.
1.0E-6 1/yr design speed                   185.       172.       198.
1.0E-7 1/yr design speed                   217.       205.       231.
```

```
   32   88    4.027E+03 1.0000     97     90     90
Point  9.175E-01  4.839E-01  1.739E+00  4.118E-04  2.172E-04  7.808E-04
Line   6.992E+00  4.819E+00  1.015E+01  1.189E-04  8.193E-05  1.725E-04
Strike Probability, 1/yr               5.307E-04  2.991E-04  9.532E-04
1.0E-5 1/yr design speed                    152.       142.       161.
1.0E-6 1/yr design speed                    188.       179.       197.
1.0E-7 1/yr design speed                    220.       211.       230.

   32   89    4.027E+03 1.0000    176    157    157
Point  1.853E+00  1.132E+00  3.033E+00  1.509E-03  9.221E-04  2.470E-03
Line   1.098E+01  8.251E+00  1.460E+01  3.386E-04  2.545E-04  4.505E-04
Strike Probability, 1/yr               1.848E-03  1.177E-03  2.921E-03
1.0E-5 1/yr design speed                    171.       163.       179.
1.0E-6 1/yr design speed                    205.       197.       213.
1.0E-7 1/yr design speed                    236.       228.       245.

   32   90    4.027E+03 1.0000    210    181    181
Point  7.414E-01  4.925E-01  1.116E+00  7.204E-04  4.786E-04  1.084E-03
Line   6.854E+00  5.385E+00  8.724E+00  2.523E-04  1.982E-04  3.211E-04
Strike Probability, 1/yr               9.727E-04  6.768E-04  1.406E-03
1.0E-5 1/yr design speed                    162.       157.       169.
1.0E-6 1/yr design speed                    197.       191.       204.
1.0E-7 1/yr design speed                    229.       222.       236.

   32   91    4.027E+03 1.0000    177    167    167
Point  7.876E-01  4.815E-01  1.288E+00  6.451E-04  3.944E-04  1.055E-03
Line   6.947E+00  5.219E+00  9.246E+00  2.155E-04  1.619E-04  2.868E-04
Strike Probability, 1/yr               8.606E-04  5.563E-04  1.342E-03
1.0E-5 1/yr design speed                    160.       153.       168.
1.0E-6 1/yr design speed                    195.       188.       203.
1.0E-7 1/yr design speed                    227.       220.       235.

   32   92    4.027E+03 1.0000    145    136    136
Point  5.898E-01  3.620E-01  9.611E-01  3.957E-04  2.429E-04  6.448E-04
Line   7.655E+00  5.517E+00  1.062E+01  1.945E-04  1.402E-04  2.699E-04
Strike Probability, 1/yr               5.903E-04  3.831E-04  9.148E-04
1.0E-5 1/yr design speed                    156.       149.       163.
1.0E-6 1/yr design speed                    191.       184.       199.
1.0E-7 1/yr design speed                    223.       216.       231.

   32   93    4.027E+03 1.0000    195    188    188
Point  1.242E+00  7.291E-01  2.115E+00  1.121E-03  6.579E-04  1.909E-03
Line   7.220E+00  5.359E+00  9.728E+00  2.468E-04  1.832E-04  3.325E-04
Strike Probability, 1/yr               1.367E-03  8.411E-04  2.241E-03
1.0E-5 1/yr design speed                    166.       158.       175.
1.0E-6 1/yr design speed                    201.       193.       209.
1.0E-7 1/yr design speed                    232.       224.       241.

   32   94    4.027E+03 1.0000    202    171    171
Point  9.336E-01  5.029E-01  1.733E+00  8.727E-04  4.701E-04  1.620E-03
Line   4.355E+00  3.257E+00  5.822E+00  1.542E-04  1.153E-04  2.061E-04
Strike Probability, 1/yr               1.027E-03  5.854E-04  1.826E-03
1.0E-5 1/yr design speed                    161.       152.       170.
1.0E-6 1/yr design speed                    196.       187.       205.
1.0E-7 1/yr design speed                    228.       218.       238.
```

```
   32   95    4.027E+03 1.0000    148    119    120
Point  5.536E-01  2.722E-01  1.126E+00  3.792E-04  1.864E-04  7.711E-04
Line   3.310E+00  2.359E+00  4.646E+00  8.587E-05  6.119E-05  1.205E-04
Strike Probability, 1/yr                4.650E-04  2.476E-04  8.916E-04
1.0E-5 1/yr design speed                     149.       138.       159.
1.0E-6 1/yr design speed                     185.       176.       195.
1.0E-7 1/yr design speed                     218.       208.       229.

   32   96    4.027E+03 1.0000    192    156    158
Point  3.643E-01  1.755E-01  7.564E-01  3.237E-04  1.559E-04  6.720E-04
Line   1.875E+00  1.387E+00  2.534E+00  6.309E-05  4.668E-05  8.526E-05
Strike Probability, 1/yr                3.868E-04  2.026E-04  7.573E-04
1.0E-5 1/yr design speed                     145.       135.       156.
1.0E-6 1/yr design speed                     182.       172.       192.
1.0E-7 1/yr design speed                     215.       205.       226.

   32   97    4.027E+03 1.0000    246    217    217
Point  2.358E-01  1.425E-01  3.901E-01  2.684E-04  1.623E-04  4.440E-04
Line   2.104E+00  1.634E+00  2.709E+00  9.071E-05  7.045E-05  1.168E-04
Strike Probability, 1/yr                3.591E-04  2.327E-04  5.608E-04
1.0E-5 1/yr design speed                     146.       139.       153.
1.0E-6 1/yr design speed                     183.       176.       190.
1.0E-7 1/yr design speed                     215.       208.       223.

   32   98    4.027E+03 1.0000    132    118    118
Point  1.677E-01  8.617E-02  3.266E-01  1.025E-04  5.263E-05  1.995E-04
Line   2.188E+00  1.541E+00  3.106E+00  5.062E-05  3.566E-05  7.186E-05
Strike Probability, 1/yr                1.531E-04  8.829E-05  2.713E-04
1.0E-5 1/yr design speed                     132.       123.       142.
1.0E-6 1/yr design speed                     171.       163.       180.
1.0E-7 1/yr design speed                     205.       197.       214.

   32   99    4.027E+03 1.0000    190    174    174
Point  1.824E-01  9.730E-02  3.420E-01  1.604E-04  8.554E-05  3.007E-04
Line   1.362E+00  1.040E+00  1.784E+00  4.535E-05  3.462E-05  5.940E-05
Strike Probability, 1/yr                2.057E-04  1.202E-04  3.601E-04
1.0E-5 1/yr design speed                     135.       127.       144.
1.0E-6 1/yr design speed                     174.       165.       182.
1.0E-7 1/yr design speed                     207.       199.       216.

   32  100    4.027E+03 1.0000    158    149    149
Point  1.489E-01  8.465E-02  2.620E-01  1.089E-04  6.189E-05  1.916E-04
Line   1.644E+00  1.236E+00  2.188E+00  4.553E-05  3.422E-05  6.058E-05
Strike Probability, 1/yr                1.544E-04  9.611E-05  2.522E-04
1.0E-5 1/yr design speed                     132.       124.       140.
1.0E-6 1/yr design speed                     171.       163.       178.
1.0E-7 1/yr design speed                     205.       197.       212.

   32  101    4.027E+03 1.0000    118    107    107
Point  1.213E-01  7.224E-02  2.038E-01  6.626E-05  3.944E-05  1.113E-04
Line   1.802E+00  1.353E+00  2.400E+00  3.727E-05  2.799E-05  4.964E-05
Strike Probability, 1/yr                1.035E-04  6.743E-05  1.609E-04
1.0E-5 1/yr design speed                     126.       117.       133.
1.0E-6 1/yr design speed                     166.       159.       173.
1.0E-7 1/yr design speed                     200.       193.       207.
```

```
   32  102    4.027E+03 1.0000     93     86     86
Point  1.209E-01  6.230E-02  2.346E-01  5.202E-05  2.681E-05  1.009E-04
Line   1.850E+00  1.258E+00  2.719E+00  3.015E-05  2.051E-05  4.433E-05
Strike Probability, 1/yr               8.217E-05  4.732E-05  1.453E-04
1.0E-5 1/yr design speed                   115.       101.       131.
1.0E-6 1/yr design speed                   157.       143.       172.
1.0E-7 1/yr design speed                   195.       180.       209.

   32  103    4.027E+03 1.0000     76     56     56
Point  1.019E-01  3.475E-02  2.985E-01  3.582E-05  1.222E-05  1.050E-04
Line   1.241E+00  7.827E-01  1.968E+00  1.653E-05  1.043E-05  2.622E-05
Strike Probability, 1/yr               5.235E-05  2.265E-05  1.312E-04
1.0E-5 1/yr design speed                   106.        85.       128.
1.0E-6 1/yr design speed                   149.       130.       169.
1.0E-7 1/yr design speed                   187.       169.       207.

   32  104    4.027E+03 1.0000     41     29     29
Point  2.347E-02  7.857E-03  7.010E-02  4.452E-06  1.491E-06  1.330E-05
Line   5.214E-01  3.217E-01  8.448E-01  3.747E-06  2.312E-06  6.071E-06
Strike Probability, 1/yr               8.199E-06  3.803E-06  1.937E-05
1.0E-5 1/yr design speed                    60.        60.        86.
1.0E-6 1/yr design speed                   116.        98.       136.
1.0E-7 1/yr design speed                   158.       140.       177.

   32  105    4.027E+03 1.0000      2      0      0

   32  106    4.027E+03 1.0000     12      8      8
Point  6.810E-02  8.092E-03  5.731E-01  3.781E-06  4.493E-07  3.182E-05
Line   1.045E+00  4.221E-01  2.587E+00  2.198E-06  8.877E-07  5.441E-06
Strike Probability, 1/yr               5.979E-06  1.337E-06  3.726E-05
1.0E-5 1/yr design speed                    60.        60.       102.
1.0E-6 1/yr design speed                   109.        74.       147.
1.0E-7 1/yr design speed                   152.       122.       186.

   32  107    4.027E+03 1.0000      4      3      3
Point  7.212E-02  5.098E-03  1.020E+00  1.335E-06  9.436E-08  1.888E-05
Line   6.297E+00  2.704E-01  1.466E+02  4.415E-06  1.896E-07  1.028E-04
Strike Probability, 1/yr               5.749E-06  2.840E-07  1.217E-04
1.0E-5 1/yr design speed                    60.        60.       130.
1.0E-6 1/yr design speed                   110.        60.       172.
1.0E-7 1/yr design speed                   154.        91.       209.

   32  108    4.027E+03 1.0000      6      2      2
Point  5.618E-01  8.451E-05  3.735E+03  1.560E-05  2.346E-09  1.037E-01
Line   7.179E+00  7.549E-02  6.827E+02  7.550E-06  7.939E-08  7.180E-04
Strike Probability, 1/yr               2.315E-05  8.174E-08  1.044E-01
1.0E-5 1/yr design speed                    88.        50.       237.
1.0E-6 1/yr design speed                   135.        50.       271.
1.0E-7 1/yr design speed                   174.        50.       303.

   32  109    4.027E+03 1.0000      4      2      2
Point  1.321E-02  2.668E-04  6.544E-01  2.446E-07  4.939E-09  1.211E-05
Line   1.000E-01  0.000E+00  0.000E+00  7.011E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr               3.147E-07  4.939E-09  1.211E-05
1.0E-5 1/yr design speed                    60.        50.        72.
1.0E-6 1/yr design speed                    60.        50.       125.
1.0E-7 1/yr design speed                    95.        50.       167.
```

```
   32  110    4.027E+03 1.0000      9      6      6
Point  3.039E-02  4.176E-03  2.211E-01  1.265E-06  1.739E-07  9.208E-06
Line   2.371E+00  3.497E-01  1.608E+01  3.741E-06  5.517E-07  2.536E-05
Strike Probability, 1/yr                5.006E-06  7.256E-07  3.457E-05
1.0E-5 1/yr design speed                      60.        60.       103.
1.0E-6 1/yr design speed                     108.        60.       150.
1.0E-7 1/yr design speed                     151.       111.       188.

   32  111    4.027E+03 1.0000     18     15     15
Point  3.938E-02  1.483E-02  1.046E-01  3.280E-06  1.235E-06  8.714E-06
Line   1.448E+00  8.661E-01  2.421E+00  4.569E-06  2.732E-06  7.639E-06
Strike Probability, 1/yr                7.849E-06  3.967E-06  1.635E-05
1.0E-5 1/yr design speed                      60.        60.        82.
1.0E-6 1/yr design speed                     116.        99.       134.
1.0E-7 1/yr design speed                     158.       142.       175.

   32  112    4.027E+03 1.0000      4      3      3
Point  1.618E-02  1.341E-03  1.952E-01  2.995E-07  2.482E-08  3.614E-06
Line   5.866E-01  1.778E-01  1.935E+00  4.113E-07  1.247E-07  1.357E-06
Strike Probability, 1/yr                7.107E-07  1.495E-07  4.970E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.       108.
1.0E-7 1/yr design speed                     114.        77.       153.

   32  113    3.624E+03 0.9000      3      2      2
Point  1.407E-01  4.710E-02  4.205E-01  2.171E-06  7.265E-07  6.485E-06
Line   1.922E+01  1.402E-02  2.636E+04  1.123E-05  8.192E-09  1.540E-02
Strike Probability, 1/yr                1.340E-05  7.347E-07  1.541E-02
1.0E-5 1/yr design speed                      76.        60.       213.
1.0E-6 1/yr design speed                     128.        60.       246.
1.0E-7 1/yr design speed                     169.       106.       277.

   32  114    2.416E+03 0.6000      8      3      3
Point  1.407E-02  2.628E-03  7.532E-02  8.680E-07  1.621E-07  4.647E-06
Line   9.826E-01  4.816E-01  2.005E+00  2.296E-06  1.125E-06  4.686E-06
Strike Probability, 1/yr                3.164E-06  1.288E-06  9.333E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      98.        74.       123.
1.0E-7 1/yr design speed                     143.       123.       165.

   32  115    1.208E+03 0.3000      2      2      2
Point  1.440E-02  6.996E-04  2.965E-01  4.443E-07  2.158E-08  9.147E-06
Line   9.098E-01  1.724E-01  4.802E+00  1.063E-06  2.014E-07  5.611E-06
Strike Probability, 1/yr                1.507E-06  2.230E-07  1.476E-05
1.0E-5 1/yr design speed                      60.        60.        79.
1.0E-6 1/yr design speed                      79.        60.       131.
1.0E-7 1/yr design speed                     129.        87.       173.

   32  116    1.611E+03 0.4000      0      0      0

   32  117    4.027E+02 0.1000      9      7      7
Point  2.009E-02  2.425E-03  1.665E-01  8.368E-06  1.010E-06  6.934E-05
Line   2.470E-01  1.292E-01  4.721E-01  3.896E-06  2.038E-06  7.448E-06
Strike Probability, 1/yr                1.226E-05  3.048E-06  7.679E-05
1.0E-5 1/yr design speed                      72.        60.       116.
1.0E-6 1/yr design speed                     123.        93.       159.
1.0E-7 1/yr design speed                     164.       137.       198.
```

```
   33   77    1.991E+02 0.0500      1      1      1
Point  3.068E-02  0.000E+00  0.000E+00  2.872E-06  0.000E+00  0.000E+00
Line   2.000E+00  0.000E+00  0.000E+00  7.091E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                9.963E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                     126.        50.        50.
1.0E-7 1/yr design speed                     164.        50.        50.

   33   78    7.963E+02 0.2000     23     21     21
Point  6.634E-02  2.002E-02  2.198E-01  3.570E-05  1.078E-05  1.183E-04
Line   1.393E+00  6.795E-01  2.858E+00  2.841E-05  1.385E-05  5.825E-05
Strike Probability, 1/yr                6.411E-05  2.463E-05  1.765E-04
1.0E-5 1/yr design speed                     113.        92.       133.
1.0E-6 1/yr design speed                     154.       138.       171.
1.0E-7 1/yr design speed                     189.       174.       206.

   33   79    3.583E+03 0.9000     50     50     50
Point  9.580E-02  5.196E-02  1.766E-01  2.491E-05  1.351E-05  4.592E-05
Line   1.961E+00  1.344E+00  2.861E+00  1.931E-05  1.323E-05  2.818E-05
Strike Probability, 1/yr                4.422E-05  2.674E-05  7.410E-05
1.0E-5 1/yr design speed                     106.        94.       117.
1.0E-6 1/yr design speed                     148.       139.       158.
1.0E-7 1/yr design speed                     184.       175.       193.

   33   80    3.981E+03 1.0000     89     86     86
Point  1.720E-01  9.259E-02  3.195E-01  7.164E-05  3.856E-05  1.331E-04
Line   2.756E+00  1.851E+00  4.103E+00  4.348E-05  2.920E-05  6.473E-05
Strike Probability, 1/yr                1.151E-04  6.777E-05  1.978E-04
1.0E-5 1/yr design speed                     124.       113.       135.
1.0E-6 1/yr design speed                     163.       154.       173.
1.0E-7 1/yr design speed                     198.       188.       207.

   33   81    3.981E+03 1.0000     91     86     86
Point  7.156E-01  3.304E-01  1.550E+00  3.047E-04  1.407E-04  6.600E-04
Line   4.416E+00  2.891E+00  6.746E+00  7.124E-05  4.663E-05  1.088E-04
Strike Probability, 1/yr                3.760E-04  1.873E-04  7.689E-04
1.0E-5 1/yr design speed                     142.       129.       156.
1.0E-6 1/yr design speed                     180.       168.       193.
1.0E-7 1/yr design speed                     215.       202.       228.

   33   82    3.981E+03 1.0000     49     49     49
Point  5.766E-01  2.424E-01  1.372E+00  1.322E-04  5.558E-05  3.146E-04
Line   2.769E+00  1.950E+00  3.930E+00  2.405E-05  1.694E-05  3.414E-05
Strike Probability, 1/yr                1.563E-04  7.252E-05  3.487E-04
1.0E-5 1/yr design speed                     129.       115.       142.
1.0E-6 1/yr design speed                     167.       156.       180.
1.0E-7 1/yr design speed                     202.       191.       214.

   33   83    3.981E+03 1.0000     55     55     55
Point  2.456E+00  7.491E-01  8.051E+00  6.321E-04  1.928E-04  2.072E-03
Line   6.438E+00  3.784E+00  1.095E+01  6.277E-05  3.689E-05  1.068E-04
Strike Probability, 1/yr                6.949E-04  2.297E-04  2.179E-03
1.0E-5 1/yr design speed                     153.       135.       171.
1.0E-6 1/yr design speed                     188.       172.       206.
1.0E-7 1/yr design speed                     221.       205.       240.
```

```
   33   84    3.981E+03 1.0000    125    122    122
Point  8.662E-01  4.685E-01  1.601E+00  5.067E-04  2.741E-04  9.368E-04
Line   4.655E+00  3.358E+00  6.454E+00  1.032E-04  7.441E-05  1.430E-04
Strike Probability, 1/yr               6.099E-04  3.485E-04  1.080E-03
1.0E-5 1/yr design speed                    153.       144.       162.
1.0E-6 1/yr design speed                    188.       180.       198.
1.0E-7 1/yr design speed                    221.       212.       231.

   33   85    3.981E+03 1.0000    107    102    102
Point  7.456E-01  4.290E-01  1.296E+00  3.733E-04  2.148E-04  6.489E-04
Line   5.874E+00  4.268E+00  8.083E+00  1.114E-04  8.096E-05  1.533E-04
Strike Probability, 1/yr               4.848E-04  2.958E-04  8.022E-04
1.0E-5 1/yr design speed                    151.       142.       159.
1.0E-6 1/yr design speed                    187.       179.       195.
1.0E-7 1/yr design speed                    219.       211.       228.

   33   86    3.981E+03 1.0000    149    129    129
Point  1.424E+00  7.807E-01  2.598E+00  9.931E-04  5.444E-04  1.812E-03
Line   6.026E+00  4.467E+00  8.129E+00  1.592E-04  1.180E-04  2.147E-04
Strike Probability, 1/yr               1.152E-03  6.624E-04  2.026E-03
1.0E-5 1/yr design speed                    162.       154.       172.
1.0E-6 1/yr design speed                    197.       188.       207.
1.0E-7 1/yr design speed                    229.       220.       239.

   33   87    3.981E+03 1.0000    141    135    135
Point  1.949E+00  9.970E-01  3.808E+00  1.286E-03  6.579E-04  2.513E-03
Line   5.549E+00  4.071E+00  7.563E+00  1.387E-04  1.018E-04  1.890E-04
Strike Probability, 1/yr               1.425E-03  7.597E-04  2.702E-03
1.0E-5 1/yr design speed                    164.       154.       175.
1.0E-6 1/yr design speed                    199.       189.       210.
1.0E-7 1/yr design speed                    231.       220.       243.

   33   88    3.981E+03 1.0000    121    107    107
Point  2.375E+00  1.201E+00  4.699E+00  1.345E-03  6.800E-04  2.661E-03
Line   9.590E+00  6.782E+00  1.356E+01  2.057E-04  1.455E-04  2.908E-04
Strike Probability, 1/yr               1.551E-03  8.255E-04  2.952E-03
1.0E-5 1/yr design speed                    167.       157.       177.
1.0E-6 1/yr design speed                    201.       191.       212.
1.0E-7 1/yr design speed                    233.       223.       245.

   33   89    3.981E+03 1.0000    105     89     89
Point  1.416E+00  7.335E-01  2.735E+00  6.960E-04  3.604E-04  1.344E-03
Line   6.552E+00  4.860E+00  8.834E+00  1.220E-04  9.046E-05  1.644E-04
Strike Probability, 1/yr               8.180E-04  4.509E-04  1.509E-03
1.0E-5 1/yr design speed                    157.       148.       167.
1.0E-6 1/yr design speed                    192.       183.       203.
1.0E-7 1/yr design speed                    225.       215.       235.

   33   90    3.981E+03 1.0000    144    129    129
Point  6.464E-01  4.253E-01  9.822E-01  4.356E-04  2.866E-04  6.619E-04
Line   7.256E+00  5.578E+00  9.438E+00  1.852E-04  1.424E-04  2.409E-04
Strike Probability, 1/yr               6.208E-04  4.290E-04  9.029E-04
1.0E-5 1/yr design speed                    156.       150.       162.
1.0E-6 1/yr design speed                    192.       185.       198.
1.0E-7 1/yr design speed                    223.       217.       231.
```

```
   33   91    3.981E+03 1.0000     95     85     85
Point  1.681E+00  8.083E-01  3.494E+00  7.472E-04  3.594E-04  1.553E-03
Line   7.534E+00  5.170E+00  1.098E+01  1.269E-04  8.706E-05  1.849E-04
Strike Probability, 1/yr                8.740E-04  4.464E-04  1.738E-03
1.0E-5 1/yr design speed                     158.       148.       169.
1.0E-6 1/yr design speed                     193.       183.       205.
1.0E-7 1/yr design speed                     225.       215.       237.

   33   92    3.981E+03 1.0000     76     71     71
Point  1.420E+00  6.244E-01  3.228E+00  5.049E-04  2.221E-04  1.148E-03
Line   7.142E+00  4.624E+00  1.103E+01  9.623E-05  6.229E-05  1.486E-04
Strike Probability, 1/yr                6.012E-04  2.844E-04  1.297E-03
1.0E-5 1/yr design speed                     152.       140.       165.
1.0E-6 1/yr design speed                     188.       177.       200.
1.0E-7 1/yr design speed                     221.       209.       233.

   33   93    3.981E+03 1.0000    113    106    106
Point  1.490E+00  8.033E-01  2.765E+00  7.881E-04  4.248E-04  1.462E-03
Line   6.409E+00  4.627E+00  8.878E+00  1.284E-04  9.268E-05  1.778E-04
Strike Probability, 1/yr                9.165E-04  5.175E-04  1.640E-03
1.0E-5 1/yr design speed                     159.       150.       168.
1.0E-6 1/yr design speed                     194.       185.       204.
1.0E-7 1/yr design speed                     226.       216.       237.

   33   94    3.981E+03 1.0000    149    126    126
Point  1.260E+00  6.426E-01  2.469E+00  8.784E-04  4.481E-04  1.722E-03
Line   6.531E+00  4.736E+00  9.007E+00  1.725E-04  1.251E-04  2.379E-04
Strike Probability, 1/yr                1.051E-03  5.732E-04  1.960E-03
1.0E-5 1/yr design speed                     161.       152.       172.
1.0E-6 1/yr design speed                     196.       187.       207.
1.0E-7 1/yr design speed                     228.       219.       239.

   33   95    3.981E+03 1.0000    126    104    104
Point  8.152E-01  3.315E-01  2.004E+00  4.807E-04  1.955E-04  1.182E-03
Line   3.358E+00  2.298E+00  4.907E+00  7.500E-05  5.133E-05  1.096E-04
Strike Probability, 1/yr                5.557E-04  2.468E-04  1.292E-03
1.0E-5 1/yr design speed                     150.       138.       164.
1.0E-6 1/yr design speed                     186.       175.       200.
1.0E-7 1/yr design speed                     219.       207.       233.

   33   96    3.981E+03 1.0000    188    159    160
Point  6.144E-01  3.130E-01  1.206E+00  5.405E-04  2.754E-04  1.061E-03
Line   3.996E+00  2.875E+00  5.553E+00  1.332E-04  9.582E-05  1.851E-04
Strike Probability, 1/yr                6.737E-04  3.712E-04  1.246E-03
1.0E-5 1/yr design speed                     155.       146.       165.
1.0E-6 1/yr design speed                     191.       182.       201.
1.0E-7 1/yr design speed                     223.       214.       233.

   33   97    3.981E+03 1.0000    152    132    132
Point  5.543E-01  2.482E-01  1.238E+00  3.943E-04  1.766E-04  8.803E-04
Line   3.157E+00  2.170E+00  4.592E+00  8.507E-05  5.848E-05  1.237E-04
Strike Probability, 1/yr                4.793E-04  2.351E-04  1.004E-03
1.0E-5 1/yr design speed                     149.       138.       161.
1.0E-6 1/yr design speed                     185.       175.       197.
1.0E-7 1/yr design speed                     218.       207.       230.
```

```
   33   98    3.981E+03 1.0000    128    114    114
Point  8.529E-01  3.330E-01  2.184E+00  5.109E-04  1.995E-04  1.309E-03
Line   3.026E+00  2.022E+00  4.528E+00  6.866E-05  4.588E-05  1.028E-04
Strike Probability, 1/yr                5.796E-04  2.454E-04  1.411E-03
1.0E-5 1/yr design speed                     151.       137.       165.
1.0E-6 1/yr design speed                     186.       174.       201.
1.0E-7 1/yr design speed                     219.       207.       234.

   33   99    3.981E+03 1.0000    122    104    104
Point  3.766E-01  1.785E-01  7.944E-01  2.150E-04  1.019E-04  4.536E-04
Line   3.014E+00  2.121E+00  4.285E+00  6.519E-05  4.586E-05  9.266E-05
Strike Probability, 1/yr                2.802E-04  1.478E-04  5.462E-04
1.0E-5 1/yr design speed                     141.       131.       152.
1.0E-6 1/yr design speed                     179.       169.       189.
1.0E-7 1/yr design speed                     211.       202.       222.

   33  100    3.981E+03 1.0000     75     72     72
Point  2.300E-01  8.686E-02  6.089E-01  8.072E-05  3.049E-05  2.137E-04
Line   2.795E+00  1.611E+00  4.851E+00  3.716E-05  2.142E-05  6.449E-05
Strike Probability, 1/yr                1.179E-04  5.191E-05  2.782E-04
1.0E-5 1/yr design speed                     127.       112.       141.
1.0E-6 1/yr design speed                     167.       155.       180.
1.0E-7 1/yr design speed                     201.       190.       214.

   33  101    3.981E+03 1.0000    198    182    182
Point  1.753E-01  1.080E-01  2.845E-01  1.624E-04  1.001E-04  2.636E-04
Line   2.673E+00  2.025E+00  3.529E+00  9.384E-05  7.108E-05  1.239E-04
Strike Probability, 1/yr                2.562E-04  1.711E-04  3.875E-04
1.0E-5 1/yr design speed                     142.       135.       150.
1.0E-6 1/yr design speed                     180.       174.       187.
1.0E-7 1/yr design speed                     213.       206.       220.

   33  102    3.981E+03 1.0000    183    166    166
Point  3.936E-01  2.145E-01  7.223E-01  3.371E-04  1.837E-04  6.186E-04
Line   3.185E+00  2.340E+00  4.336E+00  1.033E-04  7.591E-05  1.407E-04
Strike Probability, 1/yr                4.404E-04  2.596E-04  7.592E-04
1.0E-5 1/yr design speed                     145.       131.       160.
1.0E-6 1/yr design speed                     184.       169.       198.
1.0E-7 1/yr design speed                     220.       205.       233.

   33  103    3.981E+03 1.0000     34     20     20
Point  3.250E-02  1.232E-02  8.576E-02  5.172E-06  1.960E-06  1.365E-05
Line   1.495E+00  7.307E-01  3.060E+00  9.012E-06  4.404E-06  1.844E-05
Strike Probability, 1/yr                1.418E-05  6.364E-06  3.209E-05
1.0E-5 1/yr design speed                      77.        60.       101.
1.0E-6 1/yr design speed                     128.       108.       147.
1.0E-7 1/yr design speed                     168.       150.       186.

   33  104    3.981E+03 1.0000     32     22     22
Point  2.668E-03  1.579E-03  4.509E-03  3.996E-07  2.365E-07  6.753E-07
Line   2.249E-01  1.602E-01  3.157E-01  1.276E-06  9.088E-07  1.791E-06
Strike Probability, 1/yr                1.675E-06  1.145E-06  2.466E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      82.        70.        94.
1.0E-7 1/yr design speed                     132.       120.       143.
```

```
   33  105    3.981E+03 1.0000      5      4      4
Point  2.254E-01  2.098E-03  2.420E+01  5.273E-06  4.910E-08  5.664E-04
Line   2.077E+00  2.460E-01  1.754E+01  1.841E-06  2.181E-07  1.554E-05
Strike Probability, 1/yr                7.114E-06  2.672E-07  5.819E-04
1.0E-5 1/yr design speed                      60.        60.       154.
1.0E-6 1/yr design speed                     112.        60.       193.
1.0E-7 1/yr design speed                     154.        91.       229.

   33  106    3.981E+03 1.0000      4      2      2
Point  2.557E-03  1.096E-03  5.965E-03  4.786E-08  2.052E-08  1.117E-07
Line   2.500E-01  1.966E-01  3.181E-01  1.773E-07  1.394E-07  2.255E-07
Strike Probability, 1/yr                2.252E-07  1.599E-07  3.372E-07
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        60.
1.0E-7 1/yr design speed                      89.        79.       102.

   33  107    3.981E+03 1.0000      3      2      2
Point  1.582E+00  1.402E-06  1.786E+06  2.221E-05  1.968E-11  2.508E+01
Line   2.014E-01  9.716E-02  4.175E-01  1.071E-07  5.167E-08  2.220E-07
Strike Probability, 1/yr                2.232E-05  5.169E-08  2.508E+01
1.0E-5 1/yr design speed                      86.        50.       315.
1.0E-6 1/yr design speed                     131.        50.       346.
1.0E-7 1/yr design speed                     171.        50.       377.

   33  108    3.981E+03 1.0000      0      0      0

   33  109    3.981E+03 1.0000      0      0      0

   33  110    3.981E+03 1.0000      3      1      1
Point  1.534E-03  0.000E+00  0.000E+00  2.154E-08  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  5.318E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                7.472E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   33  111    3.981E+03 1.0000     29     24     24
Point  2.821E-01  8.705E-02  9.144E-01  3.829E-05  1.181E-05  1.241E-04
Line   4.555E+00  2.303E+00  9.007E+00  2.342E-05  1.184E-05  4.630E-05
Strike Probability, 1/yr                6.171E-05  2.366E-05  1.704E-04
1.0E-5 1/yr design speed                     110.        86.       133.
1.0E-6 1/yr design speed                     152.       131.       174.
1.0E-7 1/yr design speed                     190.       170.       211.

   33  112    3.981E+03 1.0000     25     17     17
Point  1.653E-02  6.921E-03  3.949E-02  1.934E-06  8.097E-07  4.620E-06
Line   7.103E-01  4.249E-01  1.187E+00  3.148E-06  1.883E-06  5.262E-06
Strike Probability, 1/yr                5.082E-06  2.693E-06  9.882E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                     107.        90.       125.
1.0E-7 1/yr design speed                     151.       135.       167.

   33  113    3.981E+03 1.0000      1      0      0
```

```
   33  114    3.981E+03 1.0000      2      1      1
Point  2.273E-03  0.000E+00  0.000E+00  2.127E-08  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  7.091E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                9.218E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   33  115    3.981E+03 1.0000      5      4      4
Point  1.441E-01  5.533E-03  3.755E+00  3.373E-06  1.295E-07  8.786E-05
Line   2.091E+00  4.272E-01  1.024E+01  1.854E-06  3.787E-07  9.074E-06
Strike Probability, 1/yr                5.226E-06  5.082E-07  9.693E-05
1.0E-5 1/yr design speed                      60.        60.       121.
1.0E-6 1/yr design speed                     106.        60.       163.
1.0E-7 1/yr design speed                     149.       104.       201.

   33  116    3.981E+03 1.0000      4      4      4
Point  3.674E-03  1.512E-03  8.924E-03  6.877E-08  2.831E-08  1.671E-07
Line   2.923E-01  1.015E-01  8.416E-01  2.073E-07  7.200E-08  5.968E-07
Strike Probability, 1/yr                2.761E-07  1.003E-07  7.638E-07
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        60.
1.0E-7 1/yr design speed                      94.        65.       121.

   33  117    2.787E+03 0.7000     32     30     30
Point  3.303E-02  1.451E-02  7.521E-02  7.066E-06  3.103E-06  1.609E-05
Line   1.101E+00  6.279E-01  1.930E+00  8.921E-06  5.089E-06  1.564E-05
Strike Probability, 1/yr                1.599E-05  8.192E-06  3.173E-05
1.0E-5 1/yr design speed                      80.        60.       100.
1.0E-6 1/yr design speed                     129.       113.       146.
1.0E-7 1/yr design speed                     170.       154.       186.

   33  118    3.981E+02 0.1000     19     18     18
Point  1.129E-01  2.224E-02  5.728E-01  1.004E-04  1.978E-05  5.093E-04
Line   1.276E+00  5.844E-01  2.788E+00  4.299E-05  1.968E-05  9.390E-05
Strike Probability, 1/yr                1.434E-04  3.946E-05  6.032E-04
1.0E-5 1/yr design speed                     126.        98.       156.
1.0E-6 1/yr design speed                     166.       140.       194.
1.0E-7 1/yr design speed                     203.       178.       230.

   34   76    3.935E+02 0.1000     36     34     34
Point  4.760E-02  2.183E-02  1.038E-01  8.114E-05  3.722E-05  1.769E-04
Line   1.183E+00  7.127E-01  1.964E+00  7.640E-05  4.602E-05  1.268E-04
Strike Probability, 1/yr                1.575E-04  8.324E-05  3.037E-04
1.0E-5 1/yr design speed                     131.       119.       143.
1.0E-6 1/yr design speed                     169.       158.       180.
1.0E-7 1/yr design speed                     202.       191.       213.

   34   77    2.754E+03 0.7000     71     64     64
Point  5.639E-02  3.099E-02  1.026E-01  2.709E-05  1.489E-05  4.928E-05
Line   1.211E+00  8.743E-01  1.678E+00  2.204E-05  1.591E-05  3.053E-05
Strike Probability, 1/yr                4.912E-05  3.079E-05  7.982E-05
1.0E-5 1/yr design speed                     108.        98.       118.
1.0E-6 1/yr design speed                     150.       141.       159.
1.0E-7 1/yr design speed                     186.       177.       194.
```

```
   34   78    3.935E+03 1.0000     76     63     63
Point  3.147E+00  7.330E-01  1.351E+01  1.132E-03  2.638E-04  4.862E-03
Line   5.129E+00  2.805E+00  9.378E+00  6.992E-05  3.824E-05  1.278E-04
Strike Probability, 1/yr               1.202E-03  3.020E-04  4.990E-03
1.0E-5 1/yr design speed                    160.       136.       185.
1.0E-6 1/yr design speed                    198.       174.       222.
1.0E-7 1/yr design speed                    233.       210.       257.

   34   79    3.935E+03 1.0000     99     95     95
Point  1.486E+00  5.834E-01  3.786E+00  6.967E-04  2.735E-04  1.775E-03
Line   6.339E+00  4.000E+00  1.004E+01  1.126E-04  7.104E-05  1.784E-04
Strike Probability, 1/yr               8.093E-04  3.445E-04  1.953E-03
1.0E-5 1/yr design speed                    155.       139.       171.
1.0E-6 1/yr design speed                    192.       177.       207.
1.0E-7 1/yr design speed                    227.       211.       243.

   34   80    3.935E+03 1.0000     69     68     68
Point  2.663E-01  1.278E-01  5.550E-01  8.701E-05  4.175E-05  1.813E-04
Line   2.373E+00  1.612E+00  3.494E+00  2.937E-05  1.995E-05  4.325E-05
Strike Probability, 1/yr               1.164E-04  6.170E-05  2.246E-04
1.0E-5 1/yr design speed                    122.       109.       135.
1.0E-6 1/yr design speed                    162.       151.       174.
1.0E-7 1/yr design speed                    198.       186.       209.

   34   81    3.935E+03 1.0000     79     78     79
Point  1.846E+00  6.437E-01  5.297E+00  6.907E-04  2.408E-04  1.982E-03
Line   5.471E+00  3.468E+00  8.630E+00  7.753E-05  4.915E-05  1.223E-04
Strike Probability, 1/yr               7.683E-04  2.899E-04  2.104E-03
1.0E-5 1/yr design speed                    153.       136.       172.
1.0E-6 1/yr design speed                    191.       174.       208.
1.0E-7 1/yr design speed                    226.       209.       244.

   34   82    3.935E+03 1.0000    104     98     99
Point  7.215E-01  3.943E-01  1.320E+00  3.553E-04  1.942E-04  6.503E-04
Line   5.666E+00  3.964E+00  8.098E+00  1.057E-04  7.395E-05  1.511E-04
Strike Probability, 1/yr               4.610E-04  2.681E-04  8.014E-04
1.0E-5 1/yr design speed                    150.       141.       159.
1.0E-6 1/yr design speed                    186.       178.       195.
1.0E-7 1/yr design speed                    218.       210.       228.

   34   83    3.935E+03 1.0000     88     86     86
Point  7.281E-01  3.827E-01  1.385E+00  3.034E-04  1.595E-04  5.773E-04
Line   5.615E+00  3.765E+00  8.375E+00  8.864E-05  5.943E-05  1.322E-04
Strike Probability, 1/yr               3.921E-04  2.189E-04  7.095E-04
1.0E-5 1/yr design speed                    147.       137.       157.
1.0E-6 1/yr design speed                    183.       175.       193.
1.0E-7 1/yr design speed                    216.       207.       226.

   34   84    3.935E+03 1.0000     92     91     91
Point  6.851E-01  4.016E-01  1.169E+00  2.985E-04  1.750E-04  5.091E-04
Line   4.916E+00  3.681E+00  6.566E+00  8.113E-05  6.074E-05  1.084E-04
Strike Probability, 1/yr               3.796E-04  2.357E-04  6.175E-04
1.0E-5 1/yr design speed                    146.       138.       154.
1.0E-6 1/yr design speed                    183.       175.       191.
1.0E-7 1/yr design speed                    215.       208.       224.
```

```
   34   85    3.935E+03 1.0000     77     75     75
Point  1.207E+00  6.278E-01  2.321E+00  4.401E-04  2.289E-04  8.462E-04
Line   5.483E+00  4.149E+00  7.245E+00  7.572E-05  5.730E-05  1.001E-04
Strike Probability, 1/yr               5.158E-04  2.862E-04  9.463E-04
1.0E-5 1/yr design speed                    150.       140.       159.
1.0E-6 1/yr design speed                    185.       177.       195.
1.0E-7 1/yr design speed                    218.       209.       229.

   34   86    3.935E+03 1.0000    170    156    156
Point  2.011E+00  1.147E+00  3.526E+00  1.619E-03  9.230E-04  2.838E-03
Line   8.784E+00  6.575E+00  1.174E+01  2.678E-04  2.005E-04  3.578E-04
Strike Probability, 1/yr               1.886E-03  1.123E-03  3.196E-03
1.0E-5 1/yr design speed                    170.       162.       179.
1.0E-6 1/yr design speed                    204.       196.       213.
1.0E-7 1/yr design speed                    235.       227.       246.

   34   87    3.935E+03 1.0000    113    105    105
Point  2.041E+00  1.043E+00  3.993E+00  1.092E-03  5.582E-04  2.136E-03
Line   8.277E+00  5.931E+00  1.155E+01  1.678E-04  1.202E-04  2.342E-04
Strike Probability, 1/yr               1.260E-03  6.784E-04  2.371E-03
1.0E-5 1/yr design speed                    163.       154.       174.
1.0E-6 1/yr design speed                    198.       189.       209.
1.0E-7 1/yr design speed                    230.       220.       241.

   34   88    3.935E+03 1.0000    120    110    110
Point  1.272E+00  6.892E-01  2.349E+00  7.229E-04  3.916E-04  1.335E-03
Line   8.333E+00  6.034E+00  1.151E+01  1.794E-04  1.299E-04  2.477E-04
Strike Probability, 1/yr               9.023E-04  5.215E-04  1.582E-03
1.0E-5 1/yr design speed                    160.       151.       169.
1.0E-6 1/yr design speed                    195.       186.       204.
1.0E-7 1/yr design speed                    227.       218.       237.

   34   89    3.935E+03 1.0000     83     71     71
Point  1.588E+00  6.461E-01  3.901E+00  6.240E-04  2.540E-04  1.533E-03
Line   7.878E+00  5.022E+00  1.236E+01  1.173E-04  7.476E-05  1.840E-04
Strike Probability, 1/yr               7.413E-04  3.287E-04  1.717E-03
1.0E-5 1/yr design speed                    156.       143.       169.
1.0E-6 1/yr design speed                    191.       179.       204.
1.0E-7 1/yr design speed                    223.       211.       237.

   34   90    3.935E+03 1.0000     93     84     84
Point  7.938E-01  3.958E-01  1.592E+00  3.496E-04  1.743E-04  7.011E-04
Line   5.926E+00  4.074E+00  8.619E+00  9.885E-05  6.796E-05  1.438E-04
Strike Probability, 1/yr               4.484E-04  2.423E-04  8.449E-04
1.0E-5 1/yr design speed                    149.       139.       159.
1.0E-6 1/yr design speed                    185.       176.       195.
1.0E-7 1/yr design speed                    218.       208.       228.

   34   91    3.935E+03 1.0000    133    115    115
Point  1.741E+00  8.962E-01  3.384E+00  1.097E-03  5.644E-04  2.131E-03
Line   8.224E+00  5.779E+00  1.170E+01  1.962E-04  1.379E-04  2.792E-04
Strike Probability, 1/yr               1.293E-03  7.023E-04  2.411E-03
1.0E-5 1/yr design speed                    164.       155.       175.
1.0E-6 1/yr design speed                    199.       190.       209.
1.0E-7 1/yr design speed                    231.       221.       242.
```

```
   34   92    3.935E+03 1.0000    171    160    160
Point  2.374E+00  1.280E+00  4.403E+00  1.922E-03  1.036E-03  3.565E-03
Line   6.423E+00  4.872E+00  8.467E+00  1.970E-04  1.494E-04  2.597E-04
Strike Probability, 1/yr               2.119E-03  1.186E-03  3.825E-03
1.0E-5 1/yr design speed                    171.       161.       181.
1.0E-6 1/yr design speed                    205.       195.       215.
1.0E-7 1/yr design speed                    236.       226.       248.

   34   93    3.935E+03 1.0000     82     73     73
Point  2.885E+00  1.087E+00  7.654E+00  1.120E-03  4.222E-04  2.972E-03
Line   6.192E+00  3.984E+00  9.626E+00  9.108E-05  5.859E-05  1.416E-04
Strike Probability, 1/yr               1.211E-03  4.808E-04  3.114E-03
1.0E-5 1/yr design speed                    161.       147.       177.
1.0E-6 1/yr design speed                    196.       182.       212.
1.0E-7 1/yr design speed                    228.       214.       245.

   34   94    3.935E+03 1.0000     76     67     67
Point  4.105E+00  1.300E+00  1.296E+01  1.477E-03  4.680E-04  4.665E-03
Line   9.200E+00  5.266E+00  1.607E+01  1.254E-04  7.178E-05  2.191E-04
Strike Probability, 1/yr               1.603E-03  5.398E-04  4.884E-03
1.0E-5 1/yr design speed                    166.       149.       184.
1.0E-6 1/yr design speed                    200.       184.       218.
1.0E-7 1/yr design speed                    232.       216.       251.

   34   95    3.935E+03 1.0000    115    100    100
Point  1.110E+00  6.049E-01  2.037E+00  6.045E-04  3.294E-04  1.109E-03
Line   6.333E+00  4.456E+00  9.001E+00  1.306E-04  9.192E-05  1.857E-04
Strike Probability, 1/yr               7.351E-04  4.213E-04  1.295E-03
1.0E-5 1/yr design speed                    156.       147.       165.
1.0E-6 1/yr design speed                    191.       183.       201.
1.0E-7 1/yr design speed                    224.       214.       234.

   34   96    3.935E+03 1.0000    201    172    172
Point  1.290E+00  6.549E-01  2.542E+00  1.228E-03  6.234E-04  2.419E-03
Line   4.599E+00  3.328E+00  6.356E+00  1.658E-04  1.200E-04  2.292E-04
Strike Probability, 1/yr               1.394E-03  7.434E-04  2.649E-03
1.0E-5 1/yr design speed                    165.       155.       176.
1.0E-6 1/yr design speed                    199.       189.       210.
1.0E-7 1/yr design speed                    231.       221.       243.

   34   97    3.935E+03 1.0000    195    167    167
Point  1.851E+00  9.100E-01  3.766E+00  1.709E-03  8.403E-04  3.477E-03
Line   5.817E+00  4.208E+00  8.041E+00  2.035E-04  1.472E-04  2.813E-04
Strike Probability, 1/yr               1.913E-03  9.875E-04  3.759E-03
1.0E-5 1/yr design speed                    169.       159.       181.
1.0E-6 1/yr design speed                    204.       193.       215.
1.0E-7 1/yr design speed                    235.       224.       248.

   34   98    3.935E+03 1.0000    191    147    147
Point  1.147E+00  5.573E-01  2.360E+00  1.037E-03  5.040E-04  2.135E-03
Line   5.502E+00  3.748E+00  8.077E+00  1.885E-04  1.284E-04  2.767E-04
Strike Probability, 1/yr               1.226E-03  6.324E-04  2.412E-03
1.0E-5 1/yr design speed                    164.       153.       175.
1.0E-6 1/yr design speed                    198.       188.       209.
1.0E-7 1/yr design speed                    230.       220.       242.
```

```
   34   99    3.935E+03 1.0000    244    178    178
Point  1.117E+00  5.508E-01  2.265E+00  1.291E-03  6.364E-04  2.617E-03
Line   4.522E+00  3.196E+00  6.398E+00  1.979E-04  1.399E-04  2.800E-04
Strike Probability, 1/yr                1.488E-03  7.763E-04  2.897E-03
1.0E-5 1/yr design speed                     166.       156.       177.
1.0E-6 1/yr design speed                     201.       191.       212.
1.0E-7 1/yr design speed                     232.       222.       244.

   34  100    3.935E+03 1.0000    127    116    116
Point  4.518E-01  2.082E-01  9.804E-01  2.717E-04  1.252E-04  5.896E-04
Line   2.533E+00  1.783E+00  3.598E+00  5.770E-05  4.062E-05  8.195E-05
Strike Probability, 1/yr                3.294E-04  1.658E-04  6.715E-04
1.0E-5 1/yr design speed                     142.       131.       154.
1.0E-6 1/yr design speed                     180.       170.       191.
1.0E-7 1/yr design speed                     213.       203.       224.

   34  101    3.935E+03 1.0000    225    210    210
Point  4.250E-01  2.500E-01  7.224E-01  4.528E-04  2.664E-04  7.697E-04
Line   2.891E+00  2.242E+00  3.728E+00  1.167E-04  9.049E-05  1.504E-04
Strike Probability, 1/yr                5.695E-04  3.569E-04  9.202E-04
1.0E-5 1/yr design speed                     153.       145.       160.
1.0E-6 1/yr design speed                     188.       181.       196.
1.0E-7 1/yr design speed                     221.       213.       229.

   34  102    3.935E+03 1.0000    226    215    215
Point  2.622E-01  1.616E-01  4.254E-01  2.806E-04  1.730E-04  4.553E-04
Line   2.954E+00  2.268E+00  3.846E+00  1.197E-04  9.195E-05  1.559E-04
Strike Probability, 1/yr                4.003E-04  2.649E-04  6.112E-04
1.0E-5 1/yr design speed                     144.       132.       157.
1.0E-6 1/yr design speed                     183.       170.       195.
1.0E-7 1/yr design speed                     219.       206.       230.

   34  103    3.935E+03 1.0000     88     52     52
Point  3.312E-01  1.038E-01  1.056E+00  1.380E-04  4.327E-05  4.402E-04
Line   3.414E+00  1.682E+00  6.933E+00  5.389E-05  2.654E-05  1.094E-04
Strike Probability, 1/yr                1.919E-04  6.981E-05  5.496E-04
1.0E-5 1/yr design speed                     131.       108.       154.
1.0E-6 1/yr design speed                     171.       149.       193.
1.0E-7 1/yr design speed                     207.       186.       229.

   34  104    3.935E+03 1.0000     13      8      8
Point  1.079E+00  3.832E-02  3.037E+01  6.642E-05  2.359E-06  1.870E-03
Line   2.988E+01  2.436E+00  3.666E+02  6.968E-05  5.679E-06  8.548E-04
Strike Probability, 1/yr                1.361E-04  8.038E-06  2.724E-03
1.0E-5 1/yr design speed                     126.        60.       182.
1.0E-6 1/yr design speed                     167.       113.       218.
1.0E-7 1/yr design speed                     204.       154.       252.

   34  105    3.935E+03 1.0000     11      7      7
Point  8.659E-03  9.521E-04  7.876E-02  4.511E-07  4.959E-08  4.102E-06
Line   4.463E-01  1.303E-01  1.529E+00  8.806E-07  2.570E-07  3.017E-06
Strike Probability, 1/yr                1.332E-06  3.066E-07  7.119E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      76.        60.       117.
1.0E-7 1/yr design speed                     127.        94.       160.
```

```
   34  106    3.935E+03 1.0000      8      4      4
Point  1.487E-01  1.989E-02  1.112E+00  5.633E-06  7.535E-07  4.211E-05
Line   2.729E+00  6.331E-01  1.176E+01  3.916E-06  9.085E-07  1.688E-05
Strike Probability, 1/yr                9.549E-06  1.662E-06  5.899E-05
1.0E-5 1/yr design speed                      60.        60.       112.
1.0E-6 1/yr design speed                     118.        79.       156.
1.0E-7 1/yr design speed                     160.       126.       195.

   34  107    3.935E+03 1.0000      2      1      1
Point  4.489E-01  0.000E+00  0.000E+00  4.251E-06  0.000E+00  0.000E+00
Line   7.900E+00  0.000E+00  0.000E+00  2.834E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                7.085E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                     112.        50.        50.
1.0E-7 1/yr design speed                     155.        50.        50.

   34  108    3.935E+03 1.0000      0      0      0

   34  109    3.935E+03 1.0000      2      2      2
Point  1.723E-02  3.225E-03  9.209E-02  1.632E-07  3.054E-08  8.721E-07
Line   6.182E-01  1.859E-01  2.056E+00  2.218E-07  6.670E-08  7.374E-07
Strike Probability, 1/yr                3.850E-07  9.724E-08  1.610E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.        82.
1.0E-7 1/yr design speed                     101.        50.       133.

   34  110    3.935E+03 1.0000      8      5      5
Point  6.141E-02  1.886E-03  2.000E+00  2.326E-06  7.144E-08  7.575E-05
Line   1.510E+00  9.082E-01  2.512E+00  2.167E-06  1.303E-06  3.604E-06
Strike Probability, 1/yr                4.494E-06  1.375E-06  7.936E-05
1.0E-5 1/yr design speed                      60.        60.       117.
1.0E-6 1/yr design speed                     104.        76.       160.
1.0E-7 1/yr design speed                     148.       125.       198.

   34  111    3.935E+03 1.0000      2      1      1
Point  5.682E-05  0.000E+00  0.000E+00  5.381E-10  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  3.587E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                3.641E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   34  112    3.935E+03 1.0000     15      7      7
Point  4.096E-02  2.081E-03  8.064E-01  2.910E-06  1.478E-07  5.728E-05
Line   5.052E-01  1.803E-01  1.416E+00  1.359E-06  4.851E-07  3.809E-06
Strike Probability, 1/yr                4.269E-06  6.329E-07  6.109E-05
1.0E-5 1/yr design speed                      60.        60.       111.
1.0E-6 1/yr design speed                     102.        60.       155.
1.0E-7 1/yr design speed                     145.       109.       194.

   34  113    3.935E+03 1.0000      1      1      1
Point  1.420E-02  0.000E+00  0.000E+00  6.726E-08  0.000E+00  0.000E+00
Line   5.000E-01  0.000E+00  0.000E+00  8.968E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.569E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      79.        50.        50.
```

```
   34  114    3.935E+03 1.0000      4      3      3
Point  5.658E-01  2.451E-03  1.306E+02  1.072E-05  4.642E-08  2.474E-03
Line   1.576E+00  2.171E-01  1.144E+01  1.131E-06  1.558E-07  8.205E-06
Strike Probability, 1/yr               1.185E-05  2.022E-07  2.482E-03
1.0E-5 1/yr design speed                     70.        60.       179.
1.0E-6 1/yr design speed                    120.        60.       215.
1.0E-7 1/yr design speed                    161.        84.       250.

   34  115    3.935E+03 1.0000      0      0      0

   34  116    3.935E+03 1.0000      7      6      6
Point  9.035E-03  1.815E-03  4.498E-02  2.995E-07  6.016E-08  1.491E-06
Line   6.225E-01  2.903E-01  1.335E+00  7.817E-07  3.645E-07  1.676E-06
Strike Probability, 1/yr               1.081E-06  4.247E-07  3.167E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     68.        60.       100.
1.0E-7 1/yr design speed                    123.       102.       147.

   34  117    3.935E+03 1.0000     21     12     12
Point  9.423E-02  1.216E-02  7.301E-01  9.370E-06  1.209E-06  7.260E-05
Line   1.425E+00  5.587E-01  3.635E+00  5.368E-06  2.104E-06  1.369E-05
Strike Probability, 1/yr               1.474E-05  3.314E-06  8.629E-05
1.0E-5 1/yr design speed                     77.        60.       119.
1.0E-6 1/yr design speed                    127.        95.       162.
1.0E-7 1/yr design speed                    167.       138.       200.

   34  118    3.935E+03 1.0000     16     14     14
Point  3.937E-02  7.166E-03  2.163E-01  2.983E-06  5.430E-07  1.639E-05
Line   6.736E-01  3.207E-01  1.415E+00  1.933E-06  9.203E-07  4.061E-06
Strike Probability, 1/yr               4.916E-06  1.463E-06  2.045E-05
1.0E-5 1/yr design speed                     60.        60.        87.
1.0E-6 1/yr design speed                    105.        76.       136.
1.0E-7 1/yr design speed                    149.       124.       177.

   34  119    2.754E+03 0.7000      4      3      3
Point  9.529E-04  4.871E-04  1.864E-03  2.579E-08  1.318E-08  5.045E-08
Line   1.000E-01  0.000E+00  0.000E+00  1.025E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr               1.283E-07  1.318E-08  5.045E-08
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                     60.        50.        50.
1.0E-7 1/yr design speed                     75.        50.        50.

   34  120    1.180E+03 0.3000      2      2      2
Point  3.513E-04  1.056E-04  1.168E-03  1.109E-08  3.335E-09  3.687E-08
Line   1.000E-01  0.000E+00  0.000E+00  1.196E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr               1.307E-07  3.335E-09  3.687E-08
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                     60.        50.        50.
1.0E-7 1/yr design speed                     76.        50.        50.

   35   75    3.887E+02 0.1000     29     27     27
Point  5.568E-02  1.948E-02  1.591E-01  7.740E-05  2.708E-05  2.212E-04
Line   9.469E-01  5.334E-01  1.681E+00  4.986E-05  2.809E-05  8.853E-05
Strike Probability, 1/yr               1.273E-04  5.516E-05  3.098E-04
1.0E-5 1/yr design speed                    126.       110.       142.
1.0E-6 1/yr design speed                    165.       151.       180.
1.0E-7 1/yr design speed                    199.       186.       214.
```

```
   35   76    3.110E+03 0.8000     52     51     51
Point  4.885E-01  1.652E-01  1.445E+00  1.522E-04  5.148E-05  4.501E-04
Line   5.153E+00  2.752E+00  9.648E+00  6.082E-05  3.248E-05  1.139E-04
Strike Probability, 1/yr               2.130E-04  8.396E-05  5.640E-04
1.0E-5 1/yr design speed                    134.       116.       151.
1.0E-6 1/yr design speed                    172.       156.       188.
1.0E-7 1/yr design speed                    207.       191.       223.

   35   77    3.887E+03 1.0000    121    108    108
Point  9.487E-01  4.351E-01  2.069E+00  5.502E-04  2.523E-04  1.200E-03
Line   5.269E+00  3.557E+00  7.806E+00  1.158E-04  7.814E-05  1.715E-04
Strike Probability, 1/yr               6.660E-04  3.305E-04  1.371E-03
1.0E-5 1/yr design speed                    152.       139.       165.
1.0E-6 1/yr design speed                    189.       176.       202.
1.0E-7 1/yr design speed                    224.       211.       237.

   35   78    3.887E+03 1.0000     88     81     81
Point  1.726E+00  6.446E-01  4.624E+00  7.283E-04  2.719E-04  1.950E-03
Line   6.196E+00  3.847E+00  9.980E+00  9.901E-05  6.147E-05  1.595E-04
Strike Probability, 1/yr               8.273E-04  3.334E-04  2.110E-03
1.0E-5 1/yr design speed                    155.       138.       172.
1.0E-6 1/yr design speed                    192.       176.       209.
1.0E-7 1/yr design speed                    227.       211.       244.

   35   79    3.887E+03 1.0000     49     38     40
Point  1.397E+00  3.437E-01  5.678E+00  3.282E-04  8.074E-05  1.334E-03
Line   6.330E+00  3.285E+00  1.220E+01  5.632E-05  2.922E-05  1.085E-04
Strike Probability, 1/yr               3.845E-04  1.100E-04  1.442E-03
1.0E-5 1/yr design speed                    142.       120.       165.
1.0E-6 1/yr design speed                    180.       159.       203.
1.0E-7 1/yr design speed                    216.       195.       238.

   35   80    3.887E+03 1.0000     90     74     75
Point  9.732E-01  3.721E-01  2.545E+00  4.199E-04  1.605E-04  1.098E-03
Line   4.804E+00  2.984E+00  7.735E+00  7.851E-05  4.877E-05  1.264E-04
Strike Probability, 1/yr               4.984E-04  2.093E-04  1.225E-03
1.0E-5 1/yr design speed                    147.       131.       163.
1.0E-6 1/yr design speed                    184.       169.       200.
1.0E-7 1/yr design speed                    219.       204.       235.

   35   81    3.887E+03 1.0000     79     70     70
Point  1.651E+00  6.601E-01  4.131E+00  6.254E-04  2.500E-04  1.565E-03
Line   6.609E+00  4.149E+00  1.053E+01  9.480E-05  5.951E-05  1.510E-04
Strike Probability, 1/yr               7.202E-04  3.095E-04  1.716E-03
1.0E-5 1/yr design speed                    153.       137.       168.
1.0E-6 1/yr design speed                    190.       175.       205.
1.0E-7 1/yr design speed                    225.       210.       241.

   35   82    3.887E+03 1.0000     26     24     24
Point  1.930E-01  7.486E-02  4.975E-01  2.405E-05  9.330E-06  6.200E-05
Line   5.373E+00  2.434E+00  1.186E+01  2.537E-05  1.149E-05  5.600E-05
Strike Probability, 1/yr               4.942E-05  2.082E-05  1.180E-04
1.0E-5 1/yr design speed                    112.        91.       130.
1.0E-6 1/yr design speed                    156.       141.       171.
1.0E-7 1/yr design speed                    192.       179.       205.
```

```
   35   83    3.887E+03 1.0000     23     20     20
Point  1.309E-01  5.275E-02  3.251E-01  1.444E-05  5.815E-06  3.584E-05
Line   4.563E+00  2.178E+00  9.561E+00  1.906E-05  9.094E-06  3.993E-05
Strike Probability, 1/yr               3.349E-05  1.491E-05  7.577E-05
1.0E-5 1/yr design speed                   104.        82.       122.
1.0E-6 1/yr design speed                   151.       136.       165.
1.0E-7 1/yr design speed                   187.       175.       200.

   35   84    3.887E+03 1.0000     55     54     54
Point  1.301E+00  6.207E-01  2.727E+00  3.430E-04  1.637E-04  7.190E-04
Line   6.313E+00  4.463E+00  8.928E+00  6.304E-05  4.458E-05  8.916E-05
Strike Probability, 1/yr               4.061E-04  2.082E-04  8.081E-04
1.0E-5 1/yr design speed                   146.       135.       157.
1.0E-6 1/yr design speed                   182.       172.       193.
1.0E-7 1/yr design speed                   215.       205.       227.

   35   85    3.887E+03 1.0000     62     61     61
Point  1.519E+00  5.002E-01  4.615E+00  4.516E-04  1.487E-04  1.372E-03
Line   4.543E+00  2.854E+00  7.233E+00  5.115E-05  3.213E-05  8.143E-05
Strike Probability, 1/yr               5.027E-04  1.808E-04  1.453E-03
1.0E-5 1/yr design speed                   148.       131.       165.
1.0E-6 1/yr design speed                   184.       169.       201.
1.0E-7 1/yr design speed                   217.       202.       234.

   35   86    3.887E+03 1.0000    104    100    100
Point  3.130E+00  1.254E+00  7.809E+00  1.560E-03  6.252E-04  3.893E-03
Line   7.179E+00  4.790E+00  1.076E+01  1.356E-04  9.046E-05  2.032E-04
Strike Probability, 1/yr               1.696E-03  7.157E-04  4.096E-03
1.0E-5 1/yr design speed                   167.       153.       181.
1.0E-6 1/yr design speed                   201.       188.       216.
1.0E-7 1/yr design speed                   233.       220.       249.

   35   87    3.887E+03 1.0000     65     65     65
Point  1.148E+01  2.221E+00  5.931E+01  3.576E-03  6.922E-04  1.848E-02
Line   6.710E+00  3.728E+00  1.208E+01  7.920E-05  4.400E-05  1.426E-04
Strike Probability, 1/yr               3.656E-03  7.362E-04  1.862E-02
1.0E-5 1/yr design speed                   177.       152.       203.
1.0E-6 1/yr design speed                   210.       186.       237.
1.0E-7 1/yr design speed                   242.       218.       269.

   35   88    3.887E+03 1.0000     93     92     92
Point  5.512E+00  1.763E+00  1.723E+01  2.457E-03  7.860E-04  7.681E-03
Line   9.429E+00  5.695E+00  1.561E+01  1.592E-04  9.617E-05  2.636E-04
Strike Probability, 1/yr               2.616E-03  8.822E-04  7.945E-03
1.0E-5 1/yr design speed                   173.       156.       191.
1.0E-6 1/yr design speed                   207.       190.       225.
1.0E-7 1/yr design speed                   238.       222.       257.

   35   89    3.887E+03 1.0000    121    115    115
Point  3.672E+00  1.380E+00  9.770E+00  2.130E-03  8.003E-04  5.667E-03
Line   6.361E+00  4.341E+00  9.322E+00  1.398E-04  9.537E-05  2.048E-04
Strike Probability, 1/yr               2.269E-03  8.956E-04  5.872E-03
1.0E-5 1/yr design speed                   171.       156.       186.
1.0E-6 1/yr design speed                   205.       191.       221.
1.0E-7 1/yr design speed                   237.       222.       253.
```

```
   35   90    3.887E+03 1.0000    146    137    137
Point  2.463E+00  1.093E+00  5.552E+00  1.724E-03  7.647E-04  3.886E-03
Line   7.158E+00  4.970E+00  1.031E+01  1.897E-04  1.318E-04  2.732E-04
Strike Probability, 1/yr                1.913E-03  8.964E-04  4.159E-03
1.0E-5 1/yr design speed                     169.       157.       182.
1.0E-6 1/yr design speed                     203.       192.       216.
1.0E-7 1/yr design speed                     235.       223.       249.

   35   91    3.887E+03 1.0000    198    190    190
Point  1.735E+00  1.106E+00  2.723E+00  1.647E-03  1.050E-03  2.584E-03
Line   6.585E+00  5.347E+00  8.110E+00  2.367E-04  1.922E-04  2.916E-04
Strike Probability, 1/yr                1.884E-03  1.242E-03  2.876E-03
1.0E-5 1/yr design speed                     170.       163.       177.
1.0E-6 1/yr design speed                     204.       197.       212.
1.0E-7 1/yr design speed                     235.       227.       244.

   35   92    3.887E+03 1.0000    154    149    149
Point  1.727E+00  1.078E+00  2.767E+00  1.275E-03  7.954E-04  2.043E-03
Line   7.622E+00  5.989E+00  9.701E+00  2.131E-04  1.675E-04  2.713E-04
Strike Probability, 1/yr                1.488E-03  9.629E-04  2.314E-03
1.0E-5 1/yr design speed                     166.       159.       174.
1.0E-6 1/yr design speed                     201.       193.       209.
1.0E-7 1/yr design speed                     232.       225.       241.

   35   93    3.887E+03 1.0000     89     78     78
Point  1.908E+00  8.271E-01  4.400E+00  8.139E-04  3.528E-04  1.877E-03
Line   7.743E+00  5.005E+00  1.198E+01  1.251E-04  8.089E-05  1.936E-04
Strike Probability, 1/yr                9.390E-04  4.337E-04  2.071E-03
1.0E-5 1/yr design speed                     159.       147.       172.
1.0E-6 1/yr design speed                     194.       182.       207.
1.0E-7 1/yr design speed                     226.       214.       240.

   35   94    3.887E+03 1.0000    133    113    113
Point  1.190E+00  5.644E-01  2.509E+00  7.586E-04  3.598E-04  1.599E-03
Line   5.461E+00  3.718E+00  8.020E+00  1.319E-04  8.980E-05  1.937E-04
Strike Probability, 1/yr                8.905E-04  4.496E-04  1.793E-03
1.0E-5 1/yr design speed                     158.       148.       170.
1.0E-6 1/yr design speed                     194.       183.       205.
1.0E-7 1/yr design speed                     226.       215.       238.

   35   95    3.887E+03 1.0000    193    164    164
Point  6.930E-01  3.813E-01  1.260E+00  6.412E-04  3.528E-04  1.165E-03
Line   3.736E+00  2.731E+00  5.111E+00  1.309E-04  9.572E-05  1.791E-04
Strike Probability, 1/yr                7.721E-04  4.485E-04  1.345E-03
1.0E-5 1/yr design speed                     157.       148.       166.
1.0E-6 1/yr design speed                     192.       184.       201.
1.0E-7 1/yr design speed                     224.       215.       234.

   35   96    3.887E+03 1.0000    229    185    185
Point  3.999E+00  2.036E+00  7.852E+00  4.389E-03  2.235E-03  8.619E-03
Line   8.242E+00  6.086E+00  1.116E+01  3.427E-04  2.531E-04  4.641E-04
Strike Probability, 1/yr                4.732E-03  2.488E-03  9.083E-03
1.0E-5 1/yr design speed                     182.       172.       193.
1.0E-6 1/yr design speed                     215.       205.       227.
1.0E-7 1/yr design speed                     247.       235.       259.
```

```
   35   97    3.887E+03 1.0000    344    285    285
Point  1.521E+00  9.558E-01  2.420E+00  2.508E-03  1.576E-03  3.991E-03
Line   6.176E+00  4.925E+00  7.745E+00  3.858E-04  3.077E-04  4.838E-04
Strike Probability, 1/yr               2.894E-03  1.884E-03  4.475E-03
1.0E-5 1/yr design speed                    177.       169.       184.
1.0E-6 1/yr design speed                    210.       203.       218.
1.0E-7 1/yr design speed                    241.       233.       250.

   35   98    3.887E+03 1.0000    214    165    165
Point  1.252E+00  6.313E-01  2.482E+00  1.284E-03  6.476E-04  2.546E-03
Line   5.291E+00  3.793E+00  7.380E+00  2.056E-04  1.474E-04  2.868E-04
Strike Probability, 1/yr               1.490E-03  7.950E-04  2.833E-03
1.0E-5 1/yr design speed                    166.       157.       177.
1.0E-6 1/yr design speed                    201.       191.       211.
1.0E-7 1/yr design speed                    232.       222.       244.

   35   99    3.887E+03 1.0000    170    119    119
Point  1.785E+00  7.766E-01  4.104E+00  1.455E-03  6.329E-04  3.344E-03
Line   6.815E+00  4.414E+00  1.052E+01  2.104E-04  1.363E-04  3.247E-04
Strike Probability, 1/yr               1.665E-03  7.692E-04  3.669E-03
1.0E-5 1/yr design speed                    168.       156.       181.
1.0E-6 1/yr design speed                    202.       190.       215.
1.0E-7 1/yr design speed                    234.       222.       247.

   35  100    3.887E+03 1.0000    161    147    147
Point  1.713E+00  7.903E-01  3.712E+00  1.322E-03  6.100E-04  2.865E-03
Line   4.213E+00  3.017E+00  5.884E+00  1.232E-04  8.820E-05  1.720E-04
Strike Probability, 1/yr               1.445E-03  6.982E-04  3.037E-03
1.0E-5 1/yr design speed                    164.       153.       177.
1.0E-6 1/yr design speed                    199.       188.       212.
1.0E-7 1/yr design speed                    231.       219.       244.

   35  101    3.887E+03 1.0000    223    210    210
Point  2.018E-01  1.231E-01  3.310E-01  2.158E-04  1.316E-04  3.538E-04
Line   2.011E+00  1.548E+00  2.613E+00  8.144E-05  6.270E-05  1.058E-04
Strike Probability, 1/yr               2.972E-04  1.943E-04  4.596E-04
1.0E-5 1/yr design speed                    143.       136.       151.
1.0E-6 1/yr design speed                    180.       174.       187.
1.0E-7 1/yr design speed                    213.       206.       221.

   35  102    3.887E+03 1.0000     67     58     58
Point  1.070E-01  5.411E-02  2.114E-01  3.435E-05  1.738E-05  6.790E-05
Line   2.241E+00  1.433E+00  3.506E+00  2.727E-05  1.743E-05  4.265E-05
Strike Probability, 1/yr               6.162E-05  3.481E-05  1.106E-04
1.0E-5 1/yr design speed                    110.        95.       126.
1.0E-6 1/yr design speed                    153.       138.       168.
1.0E-7 1/yr design speed                    191.       176.       205.

   35  103    3.887E+03 1.0000     32     16     16
Point  2.491E-01  4.322E-02  1.436E+00  3.821E-05  6.630E-06  2.202E-04
Line   1.983E+00  8.031E-01  4.898E+00  1.152E-05  4.667E-06  2.846E-05
Strike Probability, 1/yr               4.974E-05  1.130E-05  2.487E-04
1.0E-5 1/yr design speed                    104.        69.       139.
1.0E-6 1/yr design speed                    148.       117.       180.
1.0E-7 1/yr design speed                    186.       157.       216.
```

```
   35  104    3.887E+03 1.0000     10      6      6
Point  3.003E-02  7.668E-03  1.176E-01  1.440E-06  3.676E-07  5.637E-06
Line   1.031E+00  3.968E-01  2.677E+00  1.871E-06  7.205E-07  4.860E-06
Strike Probability, 1/yr               3.311E-06  1.088E-06  1.050E-05
1.0E-5 1/yr design speed                     60.        60.        67.
1.0E-6 1/yr design speed                     98.        68.       125.
1.0E-7 1/yr design speed                    143.       118.       167.

   35  105    3.887E+03 1.0000     12      7      7
Point  2.511E-02  2.400E-03  2.627E-01  1.444E-06  1.381E-07  1.511E-05
Line   9.833E-01  2.438E-01  3.965E+00  2.142E-06  5.313E-07  8.639E-06
Strike Probability, 1/yr               3.587E-06  6.694E-07  2.375E-05
1.0E-5 1/yr design speed                     60.        60.        92.
1.0E-6 1/yr design speed                    100.        60.       140.
1.0E-7 1/yr design speed                    144.       110.       180.

   35  106    3.887E+03 1.0000     22     11     11
Point  7.692E-02  1.153E-02  5.132E-01  8.112E-06  1.216E-06  5.412E-05
Line   1.492E+00  5.713E-01  3.898E+00  5.961E-06  2.282E-06  1.557E-05
Strike Probability, 1/yr               1.407E-05  3.498E-06  6.970E-05
1.0E-5 1/yr design speed                     76.        60.       115.
1.0E-6 1/yr design speed                    126.        96.       159.
1.0E-7 1/yr design speed                    167.       139.       197.

   35  107    3.887E+03 1.0000      2      1      1
Point  1.136E-01  0.000E+00  0.000E+00  1.089E-06  0.000E+00  0.000E+00
Line   2.000E+00  0.000E+00  0.000E+00  7.263E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr               1.816E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                     82.        50.        50.
1.0E-7 1/yr design speed                    131.        50.        50.

   35  108    3.887E+03 1.0000      0      0      0

   35  109    3.887E+03 1.0000      1      0      0

   35  110    3.887E+03 1.0000      4      3      3
Point  7.375E-03  2.730E-03  1.993E-02  1.414E-07  5.234E-08  3.821E-07
Line   3.090E-01  1.478E-01  6.462E-01  2.244E-07  1.073E-07  4.693E-07
Strike Probability, 1/yr               3.658E-07  1.597E-07  8.514E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                    100.        78.       122.

   35  111    3.887E+03 1.0000      7      4      4
Point  4.405E-01  1.821E-03  1.066E+02  1.478E-05  6.111E-08  3.576E-03
Line   1.370E+00  1.836E-01  1.022E+01  1.741E-06  2.334E-07  1.298E-05
Strike Probability, 1/yr               1.652E-05  2.945E-07  3.589E-03
1.0E-5 1/yr design speed                     79.        60.       185.
1.0E-6 1/yr design speed                    127.        60.       221.
1.0E-7 1/yr design speed                    167.        93.       256.
```

```
   35  112    3.887E+03 1.0000     10      8      8
Point  1.767E-01  9.740E-03  3.207E+00  8.472E-06  4.669E-07  1.537E-04
Line   3.724E+00  5.198E-01  2.668E+01  6.762E-06  9.439E-07  4.845E-05
Strike Probability, 1/yr                1.523E-05  1.411E-06  2.022E-04
1.0E-5 1/yr design speed                      78.        60.       136.
1.0E-6 1/yr design speed                     128.        76.       177.
1.0E-7 1/yr design speed                     168.       123.       214.

   35  113    3.887E+03 1.0000      4      4      4
Point  3.427E-01  4.529E-03  2.593E+01  6.571E-06  8.685E-08  4.972E-04
Line   1.816E+00  4.123E-01  7.996E+00  1.319E-06  2.995E-07  5.808E-06
Strike Probability, 1/yr                7.890E-06  3.863E-07  5.030E-04
1.0E-5 1/yr design speed                      60.        60.       151.
1.0E-6 1/yr design speed                     113.        60.       190.
1.0E-7 1/yr design speed                     155.        99.       226.

   35  114    3.887E+03 1.0000      6      5      5
Point  1.151E-01  6.619E-03  2.002E+00  3.311E-06  1.904E-07  5.758E-05
Line   8.043E-01  2.049E-01  3.158E+00  8.763E-07  2.232E-07  3.440E-06
Strike Probability, 1/yr                4.187E-06  4.136E-07  6.102E-05
1.0E-5 1/yr design speed                      60.        60.       111.
1.0E-6 1/yr design speed                     101.        60.       155.
1.0E-7 1/yr design speed                     144.        99.       194.

   35  115    3.887E+03 1.0000      1      1      1
Point  1.136E-02  0.000E+00  0.000E+00  5.447E-08  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  1.816E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.360E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      90.        50.        50.

   35  116    3.887E+03 1.0000      0      0      0

   35  117    3.887E+03 1.0000      2      2      2
Point  8.533E-04  5.569E-04  1.307E-03  8.180E-09  5.339E-09  1.253E-08
Line   1.502E-01  9.802E-02  2.301E-01  5.454E-08  3.560E-08  8.356E-08
Strike Probability, 1/yr                6.272E-08  4.093E-08  9.609E-08
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   35  118    3.887E+03 1.0000      3      3      3
Point  4.411E-03  7.176E-04  2.712E-02  6.344E-08  1.032E-08  3.899E-07
Line   7.764E-01  1.263E-01  4.772E+00  4.229E-07  6.880E-08  2.600E-06
Strike Probability, 1/yr                4.863E-07  7.912E-08  2.990E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.       100.
1.0E-7 1/yr design speed                     108.        50.       148.

   35  119    3.887E+03 1.0000      4      4      4
Point  7.392E-03  1.673E-03  3.267E-02  1.417E-07  3.207E-08  6.264E-07
Line   3.949E-01  1.717E-01  9.084E-01  2.868E-07  1.247E-07  6.597E-07
Strike Probability, 1/yr                4.285E-07  1.567E-07  1.286E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        76.
1.0E-7 1/yr design speed                     104.        78.       130.
```

```
   35  120    3.498E+03 0.9000      1      1      1
Point  2.557E-03  0.000E+00  0.000E+00  1.362E-08  0.000E+00  0.000E+00
Line   3.000E-01  0.000E+00  0.000E+00  6.053E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                7.414E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   35  121    7.774E+02 0.2000      0      0      0

   36   75    3.838E+02 0.1000     15     12     12
Point  7.023E-02  1.303E-02  3.785E-01  5.114E-05  9.489E-06  2.756E-04
Line   6.272E-01  3.648E-01  1.078E+00  1.730E-05  1.006E-05  2.975E-05
Strike Probability, 1/yr                6.844E-05  1.955E-05  3.054E-04
1.0E-5 1/yr design speed                     112.        86.       139.
1.0E-6 1/yr design speed                     153.       134.       178.
1.0E-7 1/yr design speed                     190.       171.       214.

   36   76    3.454E+03 0.9000     87     78     78
Point  2.549E-01  1.334E-01  4.872E-01  1.196E-04  6.259E-05  2.286E-04
Line   3.059E+00  2.089E+00  4.480E+00  5.438E-05  3.713E-05  7.963E-05
Strike Probability, 1/yr                1.740E-04  9.972E-05  3.083E-04
1.0E-5 1/yr design speed                     131.       120.       142.
1.0E-6 1/yr design speed                     169.       159.       179.
1.0E-7 1/yr design speed                     204.       193.       214.

   36   77    3.838E+03 1.0000     50     43     43
Point  1.002E+00  3.854E-01  2.604E+00  2.432E-04  9.356E-05  6.320E-04
Line   6.096E+00  3.654E+00  1.017E+01  5.605E-05  3.360E-05  9.350E-05
Strike Probability, 1/yr                2.992E-04  1.272E-04  7.255E-04
1.0E-5 1/yr design speed                     138.       123.       155.
1.0E-6 1/yr design speed                     177.       162.       192.
1.0E-7 1/yr design speed                     212.       197.       227.

   36   78    3.838E+03 1.0000     46     41     41
Point  2.136E-01  8.373E-02  5.452E-01  4.771E-05  1.870E-05  1.217E-04
Line   2.833E+00  1.664E+00  4.823E+00  2.397E-05  1.408E-05  4.080E-05
Strike Probability, 1/yr                7.168E-05  3.278E-05  1.625E-04
1.0E-5 1/yr design speed                     114.        98.       130.
1.0E-6 1/yr design speed                     155.       141.       169.
1.0E-7 1/yr design speed                     191.       178.       205.

   36   79    3.838E+03 1.0000     34     30     31
Point  7.715E-01  1.894E-01  3.143E+00  1.273E-04  3.125E-05  5.189E-04
Line   4.938E+00  2.513E+00  9.704E+00  3.088E-05  1.571E-05  6.067E-05
Strike Probability, 1/yr                1.582E-04  4.697E-05  5.795E-04
1.0E-5 1/yr design speed                     127.       104.       151.
1.0E-6 1/yr design speed                     166.       146.       188.
1.0E-7 1/yr design speed                     202.       182.       224.

   36   80    3.838E+03 1.0000     38     35     35
Point  1.276E+00  2.777E-01  5.861E+00  2.353E-04  5.123E-05  1.081E-03
Line   6.311E+00  3.025E+00  1.317E+01  4.410E-05  2.114E-05  9.201E-05
Strike Probability, 1/yr                2.794E-04  7.236E-05  1.173E-03
1.0E-5 1/yr design speed                     137.       112.       162.
1.0E-6 1/yr design speed                     175.       153.       199.
1.0E-7 1/yr design speed                     211.       188.       235.
```

```
   36   81    3.838E+03 1.0000     21     16     16
Point  1.897E-01  6.268E-02  5.741E-01  1.934E-05  6.391E-06  5.853E-05
Line   2.588E+00  1.364E+00  4.909E+00  9.994E-06  5.269E-06  1.896E-05
Strike Probability, 1/yr               2.933E-05  1.166E-05  7.749E-05
1.0E-5 1/yr design speed                     95.        71.       116.
1.0E-6 1/yr design speed                    140.       124.       157.
1.0E-7 1/yr design speed                    177.       162.       193.

   36   82    3.838E+03 1.0000     20     17     17
Point  2.199E+00  3.601E-01  1.343E+01  2.135E-04  3.496E-05  1.304E-03
Line   5.121E+00  2.141E+00  1.225E+01  1.883E-05  7.876E-06  4.505E-05
Strike Probability, 1/yr               2.323E-04  4.284E-05  1.349E-03
1.0E-5 1/yr design speed                    134.       104.       163.
1.0E-6 1/yr design speed                    172.       147.       199.
1.0E-7 1/yr design speed                    206.       182.       233.

   36   83    3.838E+03 1.0000     19     18     18
Point  6.000E-01  1.496E-01  2.407E+00  5.535E-05  1.380E-05  2.220E-04
Line   3.672E+00  1.978E+00  6.815E+00  1.283E-05  6.911E-06  2.381E-05
Strike Probability, 1/yr               6.818E-05  2.071E-05  2.458E-04
1.0E-5 1/yr design speed                    113.        88.       136.
1.0E-6 1/yr design speed                    155.       137.       175.
1.0E-7 1/yr design speed                    191.       175.       209.

   36   84    3.838E+03 1.0000     52     51     51
Point  1.725E+00  6.017E-01  4.947E+00  4.355E-04  1.519E-04  1.249E-03
Line   9.621E+00  5.706E+00  1.622E+01  9.200E-05  5.456E-05  1.551E-04
Strike Probability, 1/yr               5.276E-04  2.065E-04  1.404E-03
1.0E-5 1/yr design speed                    151.       136.       166.
1.0E-6 1/yr design speed                    186.       173.       202.
1.0E-7 1/yr design speed                    219.       206.       234.

   36   85    3.838E+03 1.0000     67     65     65
Point  2.389E+00  9.994E-01  5.710E+00  7.770E-04  3.251E-04  1.857E-03
Line   6.186E+00  4.397E+00  8.704E+00  7.622E-05  5.417E-05  1.072E-04
Strike Probability, 1/yr               8.533E-04  3.792E-04  1.965E-03
1.0E-5 1/yr design speed                    156.       143.       170.
1.0E-6 1/yr design speed                    191.       179.       205.
1.0E-7 1/yr design speed                    224.       211.       238.

   36   86    3.838E+03 1.0000    131    118    118
Point  3.711E+00  1.434E+00  9.603E+00  2.360E-03  9.120E-04  6.107E-03
Line   7.091E+00  4.759E+00  1.057E+01  1.708E-04  1.146E-04  2.546E-04
Strike Probability, 1/yr               2.531E-03  1.027E-03  6.362E-03
1.0E-5 1/yr design speed                    173.       159.       188.
1.0E-6 1/yr design speed                    206.       193.       222.
1.0E-7 1/yr design speed                    238.       224.       254.

   36   87    3.838E+03 1.0000     66     61     61
Point  2.256E+00  6.169E-01  8.252E+00  7.229E-04  1.977E-04  2.644E-03
Line   3.698E+00  2.225E+00  6.147E+00  4.488E-05  2.700E-05  7.460E-05
Strike Probability, 1/yr               7.678E-04  2.247E-04  2.719E-03
1.0E-5 1/yr design speed                    153.       134.       174.
1.0E-6 1/yr design speed                    189.       171.       209.
1.0E-7 1/yr design speed                    222.       204.       242.
```

```
   36   88    3.838E+03 1.0000     96     92     92
Point  7.544E-01  3.752E-01  1.517E+00  3.516E-04  1.749E-04  7.068E-04
Line   5.946E+00  4.035E+00  8.760E+00  1.050E-04  7.124E-05  1.546E-04
Strike Probability, 1/yr               4.565E-04  2.461E-04  8.615E-04
1.0E-5 1/yr design speed                    150.       139.       160.
1.0E-6 1/yr design speed                    186.       177.       196.
1.0E-7 1/yr design speed                    218.       209.       229.

   36   89    3.838E+03 1.0000    130    124    124
Point  4.581E-01  2.357E-01  8.901E-01  2.891E-04  1.488E-04  5.617E-04
Line   4.090E+00  2.825E+00  5.921E+00  9.777E-05  6.752E-05  1.416E-04
Strike Probability, 1/yr               3.869E-04  2.163E-04  7.033E-04
1.0E-5 1/yr design speed                    147.       138.       157.
1.0E-6 1/yr design speed                    184.       175.       193.
1.0E-7 1/yr design speed                    216.       208.       226.

   36   90    3.838E+03 1.0000    105     98     98
Point  6.713E-01  3.369E-01  1.337E+00  3.422E-04  1.718E-04  6.818E-04
Line   5.265E+00  3.633E+00  7.631E+00  1.017E-04  7.015E-05  1.473E-04
Strike Probability, 1/yr               4.439E-04  2.419E-04  8.291E-04
1.0E-5 1/yr design speed                    149.       139.       159.
1.0E-6 1/yr design speed                    185.       176.       195.
1.0E-7 1/yr design speed                    218.       209.       228.

   36   91    3.838E+03 1.0000     79     77     77
Point  3.325E+00  1.321E+00  8.369E+00  1.275E-03  5.067E-04  3.210E-03
Line   7.849E+00  5.329E+00  1.156E+01  1.140E-04  7.741E-05  1.680E-04
Strike Probability, 1/yr               1.389E-03  5.841E-04  3.378E-03
1.0E-5 1/yr design speed                    164.       150.       178.
1.0E-6 1/yr design speed                    198.       185.       213.
1.0E-7 1/yr design speed                    230.       217.       246.

   36   92    3.838E+03 1.0000     94     93     93
Point  2.082E+00  9.155E-01  4.736E+00  9.502E-04  4.178E-04  2.161E-03
Line   6.627E+00  4.511E+00  9.737E+00  1.146E-04  7.797E-05  1.683E-04
Strike Probability, 1/yr               1.065E-03  4.957E-04  2.330E-03
1.0E-5 1/yr design speed                    160.       148.       173.
1.0E-6 1/yr design speed                    195.       184.       208.
1.0E-7 1/yr design speed                    227.       215.       241.

   36   93    3.838E+03 1.0000     63     60     60
Point  7.661E-01  3.164E-01  1.855E+00  2.343E-04  9.676E-05  5.674E-04
Line   5.718E+00  3.434E+00  9.521E+00  6.624E-05  3.978E-05  1.103E-04
Strike Probability, 1/yr               3.006E-04  1.365E-04  6.777E-04
1.0E-5 1/yr design speed                    142.       129.       155.
1.0E-6 1/yr design speed                    179.       168.       192.
1.0E-7 1/yr design speed                    212.       201.       225.

   36   94    3.838E+03 1.0000    134    125    125
Point  1.159E+00  5.933E-01  2.262E+00  7.537E-04  3.859E-04  1.472E-03
Line   5.764E+00  4.012E+00  8.282E+00  1.420E-04  9.886E-05  2.041E-04
Strike Probability, 1/yr               8.957E-04  4.848E-04  1.676E-03
1.0E-5 1/yr design speed                    159.       149.       169.
1.0E-6 1/yr design speed                    194.       184.       204.
1.0E-7 1/yr design speed                    226.       216.       237.
```

```
   36   95    3.838E+03 1.0000    227    186    186
Point  8.507E-01  4.841E-01  1.495E+00  9.375E-04  5.335E-04  1.647E-03
Line   5.029E+00  3.754E+00  6.738E+00  2.099E-04  1.567E-04  2.813E-04
Strike Probability, 1/yr                1.147E-03  6.902E-04  1.929E-03
1.0E-5 1/yr design speed                     163.       155.       172.
1.0E-6 1/yr design speed                     198.       190.       207.
1.0E-7 1/yr design speed                     230.       221.       239.

   36   96    3.838E+03 1.0000    142    110    110
Point  1.465E+00  5.919E-01  3.626E+00  1.010E-03  4.080E-04  2.500E-03
Line   4.762E+00  3.059E+00  7.414E+00  1.244E-04  7.988E-05  1.936E-04
Strike Probability, 1/yr                1.134E-03  4.879E-04  2.693E-03
1.0E-5 1/yr design speed                     161.       148.       175.
1.0E-6 1/yr design speed                     196.       183.       210.
1.0E-7 1/yr design speed                     228.       215.       243.

   36   97    3.838E+03 1.0000    256    194    194
Point  2.367E+00  1.211E+00  4.627E+00  2.942E-03  1.505E-03  5.750E-03
Line   6.808E+00  4.951E+00  9.361E+00  3.205E-04  2.331E-04  4.407E-04
Strike Probability, 1/yr                3.263E-03  1.738E-03  6.191E-03
1.0E-5 1/yr design speed                     177.       167.       188.
1.0E-6 1/yr design speed                     211.       201.       222.
1.0E-7 1/yr design speed                     242.       231.       254.

   36   98    3.838E+03 1.0000    156    123    123
Point  1.884E+00  7.998E-01  4.439E+00  1.427E-03  6.057E-04  3.362E-03
Line   5.498E+00  3.682E+00  8.211E+00  1.577E-04  1.056E-04  2.356E-04
Strike Probability, 1/yr                1.585E-03  7.113E-04  3.598E-03
1.0E-5 1/yr design speed                     166.       154.       180.
1.0E-6 1/yr design speed                     201.       188.       214.
1.0E-7 1/yr design speed                     232.       220.       247.

   36   99    3.838E+03 1.0000    127     81     81
Point  1.132E+00  3.916E-01  3.271E+00  6.978E-04  2.414E-04  2.017E-03
Line   4.189E+00  2.515E+00  6.976E+00  9.783E-05  5.875E-05  1.629E-04
Strike Probability, 1/yr                7.956E-04  3.002E-04  2.180E-03
1.0E-5 1/yr design speed                     156.       141.       172.
1.0E-6 1/yr design speed                     191.       177.       207.
1.0E-7 1/yr design speed                     224.       210.       240.

   36  100    3.838E+03 1.0000    110     83     83
Point  7.759E-01  3.190E-01  1.887E+00  4.143E-04  1.703E-04  1.008E-03
Line   3.471E+00  2.320E+00  5.192E+00  7.021E-05  4.693E-05  1.050E-04
Strike Probability, 1/yr                4.845E-04  2.173E-04  1.113E-03
1.0E-5 1/yr design speed                     148.       135.       162.
1.0E-6 1/yr design speed                     184.       173.       198.
1.0E-7 1/yr design speed                     217.       206.       231.

   36  101    3.838E+03 1.0000    134    108    108
Point  7.199E-01  3.140E-01  1.650E+00  4.683E-04  2.043E-04  1.074E-03
Line   2.387E+00  1.688E+00  3.375E+00  5.881E-05  4.159E-05  8.316E-05
Strike Probability, 1/yr                5.271E-04  2.458E-04  1.157E-03
1.0E-5 1/yr design speed                     149.       137.       162.
1.0E-6 1/yr design speed                     185.       174.       198.
1.0E-7 1/yr design speed                     218.       206.       231.
```

```
   36  102    3.838E+03 1.0000     88     71     71
Point  7.647E-01  2.769E-01  2.112E+00  3.267E-04  1.183E-04  9.023E-04
Line   4.826E+00  2.832E+00  8.225E+00  7.810E-05  4.583E-05  1.331E-04
Strike Probability, 1/yr               4.048E-04  1.641E-04  1.035E-03
1.0E-5 1/yr design speed                    144.       123.       165.
1.0E-6 1/yr design speed                    182.       162.       203.
1.0E-7 1/yr design speed                    218.       198.       238.

   36  103    3.838E+03 1.0000     21     12     12
Point  2.971E-01  4.880E-02  1.809E+00  3.029E-05  4.975E-06  1.844E-04
Line   5.455E+00  1.663E+00  1.790E+01  2.107E-05  6.421E-06  6.911E-05
Strike Probability, 1/yr               5.136E-05  1.140E-05  2.535E-04
1.0E-5 1/yr design speed                    106.        69.       141.
1.0E-6 1/yr design speed                    150.       119.       181.
1.0E-7 1/yr design speed                    188.       159.       217.

   36  104    3.838E+03 1.0000     16     13     13
Point  1.223E-01  2.061E-02  7.260E-01  9.502E-06  1.601E-06  5.639E-05
Line   4.679E+00  1.025E+00  2.136E+01  1.377E-05  3.016E-06  6.286E-05
Strike Probability, 1/yr               2.327E-05  4.617E-06  1.192E-04
1.0E-5 1/yr design speed                     89.        60.       128.
1.0E-6 1/yr design speed                    136.       102.       170.
1.0E-7 1/yr design speed                    176.       144.       207.

   36  105    3.838E+03 1.0000      4      3      3
Point  3.277E-03  1.594E-03  6.738E-03  6.364E-08  3.095E-08  1.309E-07
Line   1.674E-01  1.213E-01  2.312E-01  1.232E-07  8.921E-08  1.700E-07
Strike Probability, 1/yr               1.868E-07  1.202E-07  3.009E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     84.        71.        99.

   36  106    3.838E+03 1.0000      1      1      1
Point  1.705E-03  0.000E+00  0.000E+00  8.275E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.839E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr               2.666E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     50.        50.        50.
1.0E-6 1/yr design speed                     50.        50.        50.
1.0E-7 1/yr design speed                     50.        50.        50.

   36  107    3.838E+03 1.0000      2      2      2
Point  1.724E-02  2.269E-03  1.310E-01  1.674E-07  2.203E-08  1.272E-06
Line   9.686E-01  6.836E-02  1.373E+01  3.562E-07  2.514E-08  5.048E-06
Strike Probability, 1/yr               5.237E-07  4.717E-08  6.320E-06
1.0E-5 1/yr design speed                     60.        50.        60.
1.0E-6 1/yr design speed                     60.        50.       117.
1.0E-7 1/yr design speed                    108.        50.       160.

   36  108    3.838E+03 1.0000      5      4      4
Point  1.319E-03  1.100E-03  1.580E-03  3.201E-08  2.670E-08  3.836E-08
Line   1.244E-01  9.648E-02  1.604E-01  1.144E-07  8.871E-08  1.475E-07
Strike Probability, 1/yr               1.464E-07  1.154E-07  1.858E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     78.        70.        87.
```

```
   36  109    3.838E+03 1.0000      1      1      1
Point  1.705E-01  0.000E+00  0.000E+00  8.275E-07  0.000E+00  0.000E+00
Line   2.500E+00  0.000E+00  0.000E+00  4.597E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.287E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      74.        50.        50.
1.0E-7 1/yr design speed                     124.        50.        50.

   36  110    3.838E+03 1.0000      1      1      1
Point  2.841E-03  0.000E+00  0.000E+00  1.379E-08  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.839E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                3.218E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   36  111    3.838E+03 1.0000      3      2      2
Point  1.401E-01  3.025E-04  6.488E+01  2.040E-06  4.405E-09  9.449E-04
Line   1.417E+01  1.703E-02  1.178E+04  7.816E-06  9.396E-09  6.501E-03
Strike Probability, 1/yr                9.856E-06  1.380E-08  7.446E-03
1.0E-5 1/yr design speed                      60.        50.       201.
1.0E-6 1/yr design speed                     122.        50.       235.
1.0E-7 1/yr design speed                     163.        50.       267.

   36  112    3.838E+03 1.0000      3      2      2
Point  3.513E-02  1.056E-02  1.168E-01  5.116E-07  1.539E-07  1.701E-06
Line   4.500E-01  3.949E-01  5.128E-01  2.483E-07  2.179E-07  2.829E-07
Strike Probability, 1/yr                7.598E-07  3.717E-07  1.984E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        86.
1.0E-7 1/yr design speed                     113.        97.       135.

   36  113    3.838E+03 1.0000      1      1      1
Point  3.409E-02  0.000E+00  0.000E+00  1.655E-07  0.000E+00  0.000E+00
Line   3.000E+00  0.000E+00  0.000E+00  5.517E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                7.172E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     115.        50.        50.

   36  114    3.838E+03 1.0000      6      5      5
Point  5.773E-03  7.853E-04  4.244E-02  1.682E-07  2.288E-08  1.236E-06
Line   2.170E-01  1.341E-01  3.512E-01  2.394E-07  1.479E-07  3.875E-07
Strike Probability, 1/yr                4.076E-07  1.708E-07  1.624E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        81.
1.0E-7 1/yr design speed                     102.        81.       132.

   36  115    3.838E+03 1.0000      5      4      4
Point  1.681E-01  1.721E-02  1.642E+00  4.081E-06  4.178E-07  3.986E-05
Line   1.512E+00  8.261E-01  2.769E+00  1.391E-06  7.596E-07  2.546E-06
Strike Probability, 1/yr                5.472E-06  1.177E-06  4.241E-05
1.0E-5 1/yr design speed                      60.        60.       104.
1.0E-6 1/yr design speed                     106.        70.       149.
1.0E-7 1/yr design speed                     149.       120.       188.
```

```
   36  116    3.838E+03 1.0000      2      2      2
Point  8.533E-04  5.569E-04  1.307E-03  8.285E-09  5.407E-09  1.269E-08
Line   1.502E-01  9.802E-02  2.301E-01  5.523E-08  3.605E-08  8.462E-08
Strike Probability, 1/yr                6.352E-08  4.146E-08  9.732E-08
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   36  117    3.838E+03 1.0000      0      0      0

   36  118    3.838E+03 1.0000      1      1      1
Point  8.523E-02  0.000E+00  0.000E+00  4.138E-07  0.000E+00  0.000E+00
Line   6.000E-01  0.000E+00  0.000E+00  1.103E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                5.241E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     105.        50.        50.

   36  119    3.838E+03 1.0000     32     32     32
Point  2.464E-02  9.543E-03  6.360E-02  3.827E-06  1.483E-06  9.880E-06
Line   1.088E+00  6.321E-01  1.871E+00  6.400E-06  3.719E-06  1.101E-05
Strike Probability, 1/yr                1.023E-05  5.202E-06  2.089E-05
1.0E-5 1/yr design speed                      66.        60.        89.
1.0E-6 1/yr design speed                     121.       105.       139.
1.0E-7 1/yr design speed                     163.       147.       179.

   36  120    3.838E+03 1.0000      7      6      6
Point  5.117E-02  4.079E-03  6.419E-01  1.739E-06  1.386E-07  2.181E-05
Line   1.453E+00  4.460E-01  4.736E+00  1.871E-06  5.742E-07  6.096E-06
Strike Probability, 1/yr                3.610E-06  7.128E-07  2.791E-05
1.0E-5 1/yr design speed                      60.        60.        95.
1.0E-6 1/yr design speed                     100.        60.       142.
1.0E-7 1/yr design speed                     144.       111.       182.

   36  121    3.070E+03 0.8000      8      8      8
Point  3.300E-02  6.482E-03  1.680E-01  1.602E-06  3.147E-07  8.157E-06
Line   9.640E-01  3.006E-01  3.091E+00  1.773E-06  5.528E-07  5.684E-06
Strike Probability, 1/yr                3.375E-06  8.675E-07  1.384E-05
1.0E-5 1/yr design speed                      60.        60.        77.
1.0E-6 1/yr design speed                      98.        60.       130.
1.0E-7 1/yr design speed                     143.       114.       172.

   36  122    1.919E+02 0.0500      1      1      1
Point  5.682E-02  0.000E+00  0.000E+00  5.517E-06  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  3.678E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                9.195E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                     118.        50.        50.
1.0E-7 1/yr design speed                     159.        50.        50.

   37   75    3.788E+02 0.1000     13     10     10
Point  5.129E-02  1.410E-02  1.866E-01  3.280E-05  9.014E-06  1.193E-04
Line   9.191E-01  4.943E-01  1.709E+00  2.226E-05  1.197E-05  4.140E-05
Strike Probability, 1/yr                5.506E-05  2.099E-05  1.607E-04
1.0E-5 1/yr design speed                     110.        88.       130.
1.0E-6 1/yr design speed                     152.       135.       169.
1.0E-7 1/yr design speed                     187.       172.       204.
```

```
   37   76    3.030E+03 0.8000     43     35     35
Point  2.942E-01  1.103E-01  7.847E-01  7.778E-05  2.916E-05  2.075E-04
Line   2.617E+00  1.587E+00  4.315E+00  2.621E-05  1.590E-05  4.321E-05
Strike Probability, 1/yr               1.040E-04  4.505E-05  2.507E-04
1.0E-5 1/yr design speed                    120.       104.       137.
1.0E-6 1/yr design speed                    160.       146.       176.
1.0E-7 1/yr design speed                    196.       182.       211.

   37   77    3.788E+03 1.0000     64     49     49
Point  1.337E+00  4.206E-01  4.250E+00  4.209E-04  1.324E-04  1.338E-03
Line   3.839E+00  2.397E+00  6.149E+00  4.578E-05  2.858E-05  7.332E-05
Strike Probability, 1/yr               4.667E-04  1.610E-04  1.411E-03
1.0E-5 1/yr design speed                    145.       126.       165.
1.0E-6 1/yr design speed                    183.       164.       202.
1.0E-7 1/yr design speed                    219.       200.       238.

   37   78    3.788E+03 1.0000     25     23     23
Point  5.486E-01  1.566E-01  1.921E+00  6.746E-05  1.926E-05  2.362E-04
Line   3.077E+00  1.807E+00  5.239E+00  1.433E-05  8.418E-06  2.440E-05
Strike Probability, 1/yr               8.179E-05  2.768E-05  2.606E-04
1.0E-5 1/yr design speed                    117.        96.       137.
1.0E-6 1/yr design speed                    158.       142.       175.
1.0E-7 1/yr design speed                    193.       179.       210.

   37   79    3.788E+03 1.0000     21     19     19
Point  2.163E-01  3.796E-02  1.233E+00  2.235E-05  3.921E-06  1.274E-04
Line   2.080E+00  8.684E-01  4.980E+00  8.137E-06  3.398E-06  1.948E-05
Strike Probability, 1/yr               3.049E-05  7.319E-06  1.469E-04
1.0E-5 1/yr design speed                     98.        60.       128.
1.0E-6 1/yr design speed                    143.       120.       167.
1.0E-7 1/yr design speed                    181.       161.       203.

   37   80    3.788E+03 1.0000     15     12     12
Point  1.964E-01  1.058E-01  3.647E-01  1.449E-05  7.805E-06  2.691E-05
Line   4.218E+00  2.210E+00  8.047E+00  1.179E-05  6.178E-06  2.249E-05
Strike Probability, 1/yr               2.628E-05  1.398E-05  4.940E-05
1.0E-5 1/yr design speed                     97.        79.       111.
1.0E-6 1/yr design speed                    144.       132.       156.
1.0E-7 1/yr design speed                    182.       171.       193.

   37   81    3.788E+03 1.0000     12      9      9
Point  9.682E-02  6.196E-02  1.513E-01  5.715E-06  3.657E-06  8.931E-06
Line   2.977E+00  1.824E+00  4.860E+00  6.657E-06  4.078E-06  1.087E-05
Strike Probability, 1/yr               1.237E-05  7.735E-06  1.980E-05
1.0E-5 1/yr design speed                     76.        60.        90.
1.0E-6 1/yr design speed                    132.       122.       141.
1.0E-7 1/yr design speed                    172.       163.       180.

   37   82    3.788E+03 1.0000      5      5      5
Point  3.214E-02  4.171E-03  2.476E-01  7.905E-07  1.026E-07  6.090E-06
Line   1.635E+00  2.797E-01  9.552E+00  1.523E-06  2.606E-07  8.899E-06
Strike Probability, 1/yr               2.313E-06  3.632E-07  1.499E-05
1.0E-5 1/yr design speed                     60.        60.        82.
1.0E-6 1/yr design speed                     96.        60.       137.
1.0E-7 1/yr design speed                    146.       108.       177.
```

```
   37   83    3.788E+03 1.0000     33     33     33
Point  3.444E-01  1.188E-01  9.983E-01  5.590E-05  1.928E-05  1.621E-04
Line   2.847E+00  1.641E+00  4.940E+00  1.751E-05  1.009E-05  3.037E-05
Strike Probability, 1/yr               7.341E-05  2.937E-05  1.924E-04
1.0E-5 1/yr design speed                   116.        98.       133.
1.0E-6 1/yr design speed                   157.       144.       172.
1.0E-7 1/yr design speed                   193.       180.       207.

   37   84    3.788E+03 1.0000     87     81     81
Point  6.266E-01  3.116E-01  1.260E+00  2.682E-04  1.334E-04  5.393E-04
Line   7.195E+00  4.667E+00  1.109E+01  1.166E-04  7.565E-05  1.798E-04
Strike Probability, 1/yr               3.848E-04  2.090E-04  7.191E-04
1.0E-5 1/yr design speed                   148.       138.       158.
1.0E-6 1/yr design speed                   185.       176.       195.
1.0E-7 1/yr design speed                   217.       208.       227.

   37   85    3.788E+03 1.0000     74     68     68
Point  6.066E-01  2.946E-01  1.249E+00  2.208E-04  1.072E-04  4.547E-04
Line   4.665E+00  3.090E+00  7.041E+00  6.432E-05  4.261E-05  9.708E-05
Strike Probability, 1/yr               2.851E-04  1.499E-04  5.518E-04
1.0E-5 1/yr design speed                   141.       130.       152.
1.0E-6 1/yr design speed                   179.       169.       189.
1.0E-7 1/yr design speed                   212.       202.       222.

   37   86    3.788E+03 1.0000     60     53     53
Point  1.729E+00  5.922E-01  5.046E+00  5.102E-04  1.748E-04  1.489E-03
Line   7.549E+00  4.462E+00  1.277E+01  8.439E-05  4.988E-05  1.428E-04
Strike Probability, 1/yr               5.946E-04  2.247E-04  1.632E-03
1.0E-5 1/yr design speed                   152.       136.       168.
1.0E-6 1/yr design speed                   187.       174.       203.
1.0E-7 1/yr design speed                   220.       206.       236.

   37   87    3.788E+03 1.0000     83     69     69
Point  2.445E+00  8.270E-01  7.231E+00  9.984E-04  3.377E-04  2.952E-03
Line   7.655E+00  4.706E+00  1.245E+01  1.184E-04  7.278E-05  1.926E-04
Strike Probability, 1/yr               1.117E-03  4.104E-04  3.145E-03
1.0E-5 1/yr design speed                   161.       146.       177.
1.0E-6 1/yr design speed                   196.       181.       212.
1.0E-7 1/yr design speed                   228.       213.       245.

   37   88    3.788E+03 1.0000     80     67     68
Point  6.897E-01  2.995E-01  1.588E+00  2.714E-04  1.179E-04  6.250E-04
Line   4.920E+00  3.138E+00  7.715E+00  7.334E-05  4.677E-05  1.150E-04
Strike Probability, 1/yr               3.447E-04  1.646E-04  7.400E-04
1.0E-5 1/yr design speed                   144.       132.       157.
1.0E-6 1/yr design speed                   181.       170.       193.
1.0E-7 1/yr design speed                   214.       203.       226.

   37   89    3.788E+03 1.0000    138    126    126
Point  7.448E-01  3.807E-01  1.457E+00  5.056E-04  2.584E-04  9.892E-04
Line   4.450E+00  3.222E+00  6.146E+00  1.144E-04  8.285E-05  1.580E-04
Strike Probability, 1/yr               6.200E-04  3.413E-04  1.147E-03
1.0E-5 1/yr design speed                   153.       144.       163.
1.0E-6 1/yr design speed                   189.       180.       199.
1.0E-7 1/yr design speed                   221.       212.       232.
```

```
   37   90    3.788E+03 1.0000     83     81     81
Point  9.833E-01  4.800E-01  2.014E+00  4.015E-04  1.960E-04  8.224E-04
Line   5.780E+00  3.913E+00  8.539E+00  8.940E-05  6.051E-05  1.321E-04
Strike Probability, 1/yr               4.909E-04  2.565E-04  9.545E-04
1.0E-5 1/yr design speed                    150.       139.       160.
1.0E-6 1/yr design speed                    186.       176.       196.
1.0E-7 1/yr design speed                    218.       208.       229.

   37   91    3.788E+03 1.0000     59     58     58
Point  5.462E-01  2.054E-01  1.452E+00  1.585E-04  5.962E-05  4.214E-04
Line   2.968E+00  1.881E+00  4.685E+00  3.263E-05  2.068E-05  5.150E-05
Strike Probability, 1/yr               1.911E-04  8.030E-05  4.729E-04
1.0E-5 1/yr design speed                    133.       118.       148.
1.0E-6 1/yr design speed                    171.       158.       185.
1.0E-7 1/yr design speed                    205.       193.       219.

   37   92    3.788E+03 1.0000     74     71     71
Point  9.097E-01  3.863E-01  2.142E+00  3.311E-04  1.406E-04  7.797E-04
Line   5.296E+00  3.465E+00  8.095E+00  7.302E-05  4.777E-05  1.116E-04
Strike Probability, 1/yr               4.042E-04  1.884E-04  8.914E-04
1.0E-5 1/yr design speed                    146.       134.       159.
1.0E-6 1/yr design speed                    183.       172.       195.
1.0E-7 1/yr design speed                    216.       205.       228.

   37   93    3.788E+03 1.0000    111    108    108
Point  8.488E-01  4.081E-01  1.766E+00  4.635E-04  2.228E-04  9.640E-04
Line   4.354E+00  3.049E+00  6.217E+00  9.005E-05  6.306E-05  1.286E-04
Strike Probability, 1/yr               5.535E-04  2.859E-04  1.093E-03
1.0E-5 1/yr design speed                    151.       140.       162.
1.0E-6 1/yr design speed                    187.       177.       198.
1.0E-7 1/yr design speed                    219.       209.       231.

   37   94    3.788E+03 1.0000    154    137    137
Point  2.036E+00  9.011E-01  4.599E+00  1.542E-03  6.826E-04  3.484E-03
Line   5.331E+00  3.724E+00  7.631E+00  1.530E-04  1.069E-04  2.190E-04
Strike Probability, 1/yr               1.695E-03  7.895E-04  3.703E-03
1.0E-5 1/yr design speed                    167.       155.       180.
1.0E-6 1/yr design speed                    201.       190.       214.
1.0E-7 1/yr design speed                    233.       221.       247.

   37   95    3.788E+03 1.0000    134    114    114
Point  2.103E+00  1.012E+00  4.372E+00  1.386E-03  6.670E-04  2.882E-03
Line   6.894E+00  4.797E+00  9.908E+00  1.721E-04  1.198E-04  2.474E-04
Strike Probability, 1/yr               1.559E-03  7.868E-04  3.129E-03
1.0E-5 1/yr design speed                    166.       156.       178.
1.0E-6 1/yr design speed                    201.       190.       212.
1.0E-7 1/yr design speed                    232.       221.       245.

   37   96    3.788E+03 1.0000    120     98     98
Point  1.976E+00  7.662E-01  5.094E+00  1.166E-03  4.523E-04  3.007E-03
Line   6.863E+00  4.377E+00  1.076E+01  1.535E-04  9.786E-05  2.406E-04
Strike Probability, 1/yr               1.320E-03  5.501E-04  3.248E-03
1.0E-5 1/yr design speed                    164.       151.       178.
1.0E-6 1/yr design speed                    199.       186.       213.
1.0E-7 1/yr design speed                    230.       217.       246.
```

```
   37   97    3.788E+03 1.0000    219    170    170
Point  1.441E+00  7.496E-01  2.771E+00  1.553E-03  8.076E-04  2.985E-03
Line   6.054E+00  4.306E+00  8.511E+00  2.470E-04  1.757E-04  3.473E-04
Strike Probability, 1/yr                1.800E-03  9.833E-04  3.332E-03
1.0E-5 1/yr design speed                     169.       160.       180.
1.0E-6 1/yr design speed                     203.       194.       214.
1.0E-7 1/yr design speed                     235.       225.       246.

   37   98    3.788E+03 1.0000    158    130    130
Point  6.519E-01  3.520E-01  1.207E+00  5.067E-04  2.736E-04  9.382E-04
Line   5.035E+00  3.586E+00  7.069E+00  1.482E-04  1.056E-04  2.081E-04
Strike Probability, 1/yr                6.549E-04  3.792E-04  1.146E-03
1.0E-5 1/yr design speed                     155.       147.       164.
1.0E-6 1/yr design speed                     191.       183.       200.
1.0E-7 1/yr design speed                     223.       214.       233.

   37   99    3.788E+03 1.0000    114     92     92
Point  9.892E-01  4.243E-01  2.306E+00  5.547E-04  2.379E-04  1.293E-03
Line   8.225E+00  5.054E+00  1.339E+01  1.747E-04  1.074E-04  2.843E-04
Strike Probability, 1/yr                7.294E-04  3.453E-04  1.578E-03
1.0E-5 1/yr design speed                     157.       146.       170.
1.0E-6 1/yr design speed                     193.       182.       205.
1.0E-7 1/yr design speed                     225.       214.       237.

   37  100    3.788E+03 1.0000    158    121    121
Point  4.427E-01  2.488E-01  7.877E-01  3.440E-04  1.933E-04  6.122E-04
Line   5.627E+00  3.927E+00  8.063E+00  1.657E-04  1.156E-04  2.374E-04
Strike Probability, 1/yr                5.097E-04  3.090E-04  8.496E-04
1.0E-5 1/yr design speed                     153.       145.       162.
1.0E-6 1/yr design speed                     189.       182.       198.
1.0E-7 1/yr design speed                     221.       213.       230.

   37  101    3.788E+03 1.0000     91     71     71
Point  7.935E-01  3.139E-01  2.006E+00  3.552E-04  1.405E-04  8.979E-04
Line   5.885E+00  3.407E+00  1.016E+01  9.978E-05  5.777E-05  1.723E-04
Strike Probability, 1/yr                4.550E-04  1.983E-04  1.070E-03
1.0E-5 1/yr design speed                     149.       136.       163.
1.0E-6 1/yr design speed                     185.       173.       199.
1.0E-7 1/yr design speed                     218.       206.       231.

   37  102    3.788E+03 1.0000     63     53     53
Point  2.671E-01  9.561E-02  7.464E-01  8.278E-05  2.963E-05  2.313E-04
Line   3.026E+00  1.689E+00  5.421E+00  3.552E-05  1.983E-05  6.364E-05
Strike Probability, 1/yr                1.183E-04  4.946E-05  2.949E-04
1.0E-5 1/yr design speed                     122.       102.       143.
1.0E-6 1/yr design speed                     163.       143.       183.
1.0E-7 1/yr design speed                     200.       181.       219.

   37  103    3.788E+03 1.0000     12      7      7
Point  7.764E-01  4.735E-02  1.273E+01  4.583E-05  2.795E-06  7.514E-04
Line   5.863E+00  1.434E+00  2.397E+01  1.311E-05  3.206E-06  5.360E-05
Strike Probability, 1/yr                5.894E-05  6.001E-06  8.050E-04
1.0E-5 1/yr design speed                     108.        60.       160.
1.0E-6 1/yr design speed                     150.       106.       198.
1.0E-7 1/yr design speed                     188.       148.       234.
```

```
   37  104    3.788E+03 1.0000     23     18     18
Point  1.060E-02  4.761E-03  2.360E-02  1.199E-06  5.386E-07  2.670E-06
Line   3.955E-01  2.556E-01  6.121E-01  1.695E-06  1.095E-06  2.623E-06
Strike Probability, 1/yr               2.894E-06  1.634E-06  5.293E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     95.        79.       111.
1.0E-7 1/yr design speed                    140.       126.       156.

   37  105    3.788E+03 1.0000     11      9      9
Point  2.646E-02  8.428E-03  8.305E-02  1.432E-06  4.560E-07  4.494E-06
Line   8.511E-01  4.052E-01  1.787E+00  1.744E-06  8.306E-07  3.663E-06
Strike Probability, 1/yr               3.176E-06  1.287E-06  8.157E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     97.        73.       120.
1.0E-7 1/yr design speed                    142.       122.       163.

   37  106    3.788E+03 1.0000      6      6      6
Point  2.104E+00  5.725E-02  7.732E+01  6.209E-05  1.690E-06  2.282E-03
Line   5.511E+00  1.055E+00  2.878E+01  6.161E-06  1.180E-06  3.218E-05
Strike Probability, 1/yr               6.825E-05  2.869E-06  2.314E-03
1.0E-5 1/yr design speed                    110.        60.       178.
1.0E-6 1/yr design speed                    152.        90.       214.
1.0E-7 1/yr design speed                    190.       134.       249.

   37  107    3.788E+03 1.0000      4      3      4
Point  3.718E-03  1.321E-03  1.046E-02  7.316E-08  2.599E-08  2.059E-07
Line   2.783E-01  1.626E-01  4.762E-01  2.074E-07  1.212E-07  3.549E-07
Strike Probability, 1/yr               2.806E-07  1.472E-07  5.608E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     95.        77.       113.

   37  108    3.788E+03 1.0000      3      3      3
Point  3.415E-02  9.302E-03  1.254E-01  5.040E-07  1.373E-07  1.850E-06
Line   7.620E-01  3.644E-01  1.594E+00  4.260E-07  2.037E-07  8.908E-07
Strike Probability, 1/yr               9.300E-07  3.410E-07  2.741E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        95.
1.0E-7 1/yr design speed                    118.        95.       143.

   37  109    3.788E+03 1.0000      0      0      0

   37  110    3.788E+03 1.0000      0      0      0

   37  111    3.788E+03 1.0000      0      0      0

   37  112    3.788E+03 1.0000      2      2      2
Point  1.380E-02  2.410E-03  7.896E-02  1.357E-07  2.371E-08  7.769E-07
Line   1.272E+00  4.767E-01  3.391E+00  4.738E-07  1.777E-07  1.264E-06
Strike Probability, 1/yr               6.096E-07  2.014E-07  2.041E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        89.
1.0E-7 1/yr design speed                    112.        85.       139.
```

```
   37  113    3.788E+03 1.0000      5      5      5
Point  1.601E-01  3.368E-03  7.614E+00  3.939E-06  8.284E-08  1.873E-04
Line   7.478E-01  2.030E-01  2.754E+00  6.967E-07  1.891E-07  2.566E-06
Strike Probability, 1/yr                4.635E-06  2.720E-07  1.898E-04
1.0E-5 1/yr design speed                      60.        60.       134.
1.0E-6 1/yr design speed                     103.        60.       174.
1.0E-7 1/yr design speed                     146.        91.       211.

   37  114    3.788E+03 1.0000      1      1      1
Point  1.136E-03  0.000E+00  0.000E+00  5.590E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.863E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.422E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   37  115    3.788E+03 1.0000      4      2      3
Point  1.321E-02  2.668E-04  6.544E-01  2.600E-07  5.250E-09  1.288E-05
Line   1.828E+00  2.170E-01  1.539E+01  1.362E-06  1.617E-07  1.147E-05
Strike Probability, 1/yr                1.622E-06  1.670E-07  2.435E-05
1.0E-5 1/yr design speed                      60.        60.        93.
1.0E-6 1/yr design speed                      81.        60.       141.
1.0E-7 1/yr design speed                     131.        81.       181.

   37  116    3.788E+03 1.0000      1      1      1
Point  5.682E-04  0.000E+00  0.000E+00  2.795E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.863E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.143E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   37  117    3.788E+03 1.0000      0      0      0

   37  118    3.788E+03 1.0000      0      0      0

   37  119    3.788E+03 1.0000      2      1      1
Point  2.557E-02  0.000E+00  0.000E+00  2.515E-07  0.000E+00  0.000E+00
Line   5.000E-01  0.000E+00  0.000E+00  1.863E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                4.379E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     103.        50.        50.

   37  120    3.788E+03 1.0000     19     18     18
Point  6.862E-02  1.556E-02  3.026E-01  6.414E-06  1.455E-06  2.828E-05
Line   1.100E+00  6.261E-01  1.933E+00  3.895E-06  2.217E-06  6.842E-06
Strike Probability, 1/yr                1.031E-05  3.671E-06  3.512E-05
1.0E-5 1/yr design speed                      66.        60.       101.
1.0E-6 1/yr design speed                     120.        97.       146.
1.0E-7 1/yr design speed                     161.       140.       186.
```

```
   37  121    3.788E+03 1.0000     14      9      9
Point  1.302E-02  4.727E-03  3.586E-02  8.966E-07  3.255E-07  2.469E-06
Line   3.626E-01  2.003E-01  6.565E-01  9.459E-07  5.225E-07  1.713E-06
Strike Probability, 1/yr                1.842E-06  8.480E-07  4.182E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      83.        60.       105.
1.0E-7 1/yr design speed                     132.       113.       151.

   37  122    1.136E+03 0.3000     11     11     11
Point  2.880E-02  8.388E-03  9.886E-02  5.194E-06  1.513E-06  1.783E-05
Line   6.526E-01  3.185E-01  1.337E+00  4.458E-06  2.176E-06  9.135E-06
Strike Probability, 1/yr                9.652E-06  3.689E-06  2.696E-05
1.0E-5 1/yr design speed                      60.        60.        95.
1.0E-6 1/yr design speed                     119.        97.       142.
1.0E-7 1/yr design speed                     161.       140.       182.

   38   74    1.868E+02 0.0500      1      1      1
Point  1.359E-01  0.000E+00  0.000E+00  1.355E-05  0.000E+00  0.000E+00
Line   5.979E+00  0.000E+00  0.000E+00  2.259E-05  0.000E+00  0.000E+00
Strike Probability, 1/yr                3.614E-05  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     104.        50.        50.
1.0E-6 1/yr design speed                     147.        50.        50.
1.0E-7 1/yr design speed                     182.        50.        50.

   38   75    3.363E+03 0.9000     50     48     48
Point  2.296E-01  8.684E-02  6.071E-01  6.361E-05  2.406E-05  1.682E-04
Line   3.160E+00  1.775E+00  5.626E+00  3.316E-05  1.863E-05  5.904E-05
Strike Probability, 1/yr                9.677E-05  4.268E-05  2.272E-04
1.0E-5 1/yr design speed                     120.       104.       136.
1.0E-6 1/yr design speed                     160.       146.       175.
1.0E-7 1/yr design speed                     195.       181.       209.

   38   76    3.737E+03 1.0000     64     61     61
Point  2.238E-01  1.122E-01  4.461E-01  7.142E-05  3.582E-05  1.424E-04
Line   2.398E+00  1.659E+00  3.468E+00  2.899E-05  2.005E-05  4.192E-05
Strike Probability, 1/yr                1.004E-04  5.588E-05  1.843E-04
1.0E-5 1/yr design speed                     120.       108.       132.
1.0E-6 1/yr design speed                     160.       150.       171.
1.0E-7 1/yr design speed                     195.       185.       206.

   38   77    3.737E+03 1.0000     63     61     61
Point  4.003E-01  1.863E-01  8.604E-01  1.258E-04  5.851E-05  2.703E-04
Line   4.116E+00  2.691E+00  6.293E+00  4.898E-05  3.203E-05  7.489E-05
Strike Probability, 1/yr                1.747E-04  9.054E-05  3.452E-04
1.0E-5 1/yr design speed                     130.       117.       143.
1.0E-6 1/yr design speed                     169.       157.       181.
1.0E-7 1/yr design speed                     204.       192.       216.

   38   78    3.737E+03 1.0000     42     36     36
Point  1.854E-01  7.286E-02  4.717E-01  3.883E-05  1.526E-05  9.878E-05
Line   2.513E+00  1.448E+00  4.361E+00  1.994E-05  1.149E-05  3.460E-05
Strike Probability, 1/yr                5.876E-05  2.675E-05  1.334E-04
1.0E-5 1/yr design speed                     113.        97.       129.
1.0E-6 1/yr design speed                     156.       144.       169.
1.0E-7 1/yr design speed                     192.       181.       204.
```

```
   38   79    3.737E+03 1.0000     11      9      9
Point  4.088E-02  1.632E-02  1.024E-01  2.242E-06  8.954E-07  5.615E-06
Line   2.001E+00  7.690E-01  5.208E+00  4.158E-06  1.598E-06  1.082E-05
Strike Probability, 1/yr               6.400E-06  2.493E-06  1.644E-05
1.0E-5 1/yr design speed                     60.        60.        85.
1.0E-6 1/yr design speed                    120.        98.       140.
1.0E-7 1/yr design speed                    163.       146.       179.

   38   80    3.737E+03 1.0000      6      4      4
Point  6.453E-02  5.917E-03  7.038E-01  1.931E-06  1.770E-07  2.106E-05
Line   1.669E+00  2.654E-01  1.049E+01  1.891E-06  3.008E-07  1.189E-05
Strike Probability, 1/yr               3.822E-06  4.778E-07  3.295E-05
1.0E-5 1/yr design speed                     60.        60.       101.
1.0E-6 1/yr design speed                    106.        60.       147.
1.0E-7 1/yr design speed                    152.       113.       185.

   38   81    3.737E+03 1.0000     14     11     11
Point  6.605E-02  1.787E-02  2.442E-01  4.611E-06  1.247E-06  1.705E-05
Line   1.392E+00  6.110E-01  3.170E+00  3.681E-06  1.616E-06  8.384E-06
Strike Probability, 1/yr               8.292E-06  2.863E-06  2.543E-05
1.0E-5 1/yr design speed                     60.        60.        94.
1.0E-6 1/yr design speed                    123.       101.       142.
1.0E-7 1/yr design speed                    164.       148.       180.

   38   82    3.737E+03 1.0000     38     34     34
Point  8.379E-01  2.683E-01  2.617E+00  1.588E-04  5.083E-05  4.959E-04
Line   5.019E+00  2.648E+00  9.513E+00  3.602E-05  1.901E-05  6.828E-05
Strike Probability, 1/yr               1.948E-04  6.984E-05  5.642E-04
1.0E-5 1/yr design speed                    133.       115.       151.
1.0E-6 1/yr design speed                    172.       157.       188.
1.0E-7 1/yr design speed                    206.       191.       222.

   38   83    3.737E+03 1.0000     48     45     45
Point  1.014E+00  3.643E-01  2.824E+00  2.428E-04  8.719E-05  6.759E-04
Line   6.177E+00  3.774E+00  1.011E+01  5.600E-05  3.422E-05  9.167E-05
Strike Probability, 1/yr               2.988E-04  1.214E-04  7.675E-04
1.0E-5 1/yr design speed                    141.       127.       156.
1.0E-6 1/yr design speed                    178.       166.       193.
1.0E-7 1/yr design speed                    211.       199.       226.

   38   84    3.737E+03 1.0000     78     70     70
Point  5.488E-01  2.893E-01  1.041E+00  2.135E-04  1.125E-04  4.050E-04
Line   6.248E+00  4.224E+00  9.243E+00  9.206E-05  6.223E-05  1.362E-04
Strike Probability, 1/yr               3.055E-04  1.747E-04  5.412E-04
1.0E-5 1/yr design speed                    144.       135.       154.
1.0E-6 1/yr design speed                    181.       173.       190.
1.0E-7 1/yr design speed                    214.       205.       223.

   38   85    3.737E+03 1.0000    113     99     99
Point  1.394E+00  7.092E-01  2.740E+00  7.856E-04  3.996E-04  1.544E-03
Line   6.471E+00  4.630E+00  9.045E+00  1.381E-04  9.882E-05  1.931E-04
Strike Probability, 1/yr               9.237E-04  4.985E-04  1.737E-03
1.0E-5 1/yr design speed                    159.       150.       169.
1.0E-6 1/yr design speed                    194.       185.       205.
1.0E-7 1/yr design speed                    226.       216.       237.
```

```
   38   86    3.737E+03 1.0000     80     69     69
Point  6.232E-01  2.853E-01  1.361E+00  2.486E-04  1.138E-04  5.431E-04
Line   4.865E+00  3.178E+00  7.446E+00  7.351E-05  4.803E-05  1.125E-04
Strike Probability, 1/yr               3.221E-04  1.618E-04  6.556E-04
1.0E-5 1/yr design speed                    143.       132.       155.
1.0E-6 1/yr design speed                    180.       170.       191.
1.0E-7 1/yr design speed                    213.       203.       225.

   38   87    3.737E+03 1.0000    116    100    100
Point  7.088E-01  3.622E-01  1.387E+00  4.100E-04  2.095E-04  8.024E-04
Line   4.945E+00  3.439E+00  7.110E+00  1.083E-04  7.535E-05  1.558E-04
Strike Probability, 1/yr               5.184E-04  2.849E-04  9.582E-04
1.0E-5 1/yr design speed                    151.       141.       161.
1.0E-6 1/yr design speed                    187.       178.       197.
1.0E-7 1/yr design speed                    219.       210.       230.

   38   88    3.737E+03 1.0000     97     85     85
Point  1.412E+00  6.702E-01  2.975E+00  6.830E-04  3.242E-04  1.439E-03
Line   8.883E+00  5.818E+00  1.356E+01  1.627E-04  1.066E-04  2.485E-04
Strike Probability, 1/yr               8.457E-04  4.308E-04  1.688E-03
1.0E-5 1/yr design speed                    159.       148.       170.
1.0E-6 1/yr design speed                    194.       184.       205.
1.0E-7 1/yr design speed                    226.       215.       237.

   38   89    3.737E+03 1.0000    141    126    126
Point  7.636E-01  4.625E-01  1.261E+00  5.369E-04  3.252E-04  8.864E-04
Line   7.107E+00  5.244E+00  9.631E+00  1.893E-04  1.397E-04  2.565E-04
Strike Probability, 1/yr               7.261E-04  4.648E-04  1.143E-03
1.0E-5 1/yr design speed                    158.       151.       165.
1.0E-6 1/yr design speed                    193.       186.       201.
1.0E-7 1/yr design speed                    225.       217.       233.

   38   90    3.737E+03 1.0000    149    135    135
Point  4.406E-01  2.578E-01  7.528E-01  3.273E-04  1.916E-04  5.593E-04
Line   4.556E+00  3.314E+00  6.264E+00  1.282E-04  9.327E-05  1.763E-04
Strike Probability, 1/yr               4.556E-04  2.848E-04  7.356E-04
1.0E-5 1/yr design speed                    151.       143.       158.
1.0E-6 1/yr design speed                    187.       180.       195.
1.0E-7 1/yr design speed                    219.       211.       227.

   38   91    3.737E+03 1.0000     53     52     52
Point  3.169E-01  1.513E-01  6.636E-01  8.376E-05  4.000E-05  1.754E-04
Line   4.387E+00  2.676E+00  7.191E+00  4.392E-05  2.679E-05  7.199E-05
Strike Probability, 1/yr               1.277E-04  6.679E-05  2.474E-04
1.0E-5 1/yr design speed                    129.       117.       141.
1.0E-6 1/yr design speed                    169.       159.       179.
1.0E-7 1/yr design speed                    203.       193.       213.

   38   92    3.737E+03 1.0000    124    117    117
Point  2.164E-01  1.235E-01  3.792E-01  1.338E-04  7.634E-05  2.345E-04
Line   2.713E+00  1.948E+00  3.778E+00  6.354E-05  4.562E-05  8.850E-05
Strike Probability, 1/yr               1.973E-04  1.220E-04  3.230E-04
1.0E-5 1/yr design speed                    137.       129.       145.
1.0E-6 1/yr design speed                    175.       168.       183.
1.0E-7 1/yr design speed                    208.       201.       217.
```

```
   38   93    3.737E+03 1.0000     88     88     88
Point  3.776E-01  1.907E-01  7.477E-01  1.657E-04  8.367E-05  3.281E-04
Line   3.937E+00  2.643E+00  5.866E+00  6.545E-05  4.393E-05  9.750E-05
Strike Probability, 1/yr               2.311E-04  1.276E-04  4.256E-04
1.0E-5 1/yr design speed                    139.       129.       149.
1.0E-6 1/yr design speed                    177.       168.       186.
1.0E-7 1/yr design speed                    210.       201.       220.

   38   94    3.737E+03 1.0000    111     96     96
Point  7.467E-01  3.343E-01  1.668E+00  4.133E-04  1.850E-04  9.232E-04
Line   4.356E+00  2.968E+00  6.394E+00  9.134E-05  6.223E-05  1.341E-04
Strike Probability, 1/yr               5.046E-04  2.473E-04  1.057E-03
1.0E-5 1/yr design speed                    150.       139.       162.
1.0E-6 1/yr design speed                    186.       176.       198.
1.0E-7 1/yr design speed                    219.       208.       231.

   38   95    3.737E+03 1.0000    146    114    114
Point  1.974E+00  8.346E-01  4.670E+00  1.437E-03  6.076E-04  3.400E-03
Line   8.068E+00  5.064E+00  1.285E+01  2.225E-04  1.397E-04  3.544E-04
Strike Probability, 1/yr               1.660E-03  7.473E-04  3.754E-03
1.0E-5 1/yr design speed                    168.       156.       181.
1.0E-6 1/yr design speed                    202.       190.       215.
1.0E-7 1/yr design speed                    234.       221.       248.

   38   96    3.737E+03 1.0000    136    103    103
Point  1.704E+00  7.651E-01  3.797E+00  1.156E-03  5.189E-04  2.575E-03
Line   7.468E+00  5.083E+00  1.097E+01  1.919E-04  1.306E-04  2.819E-04
Strike Probability, 1/yr               1.348E-03  6.495E-04  2.857E-03
1.0E-5 1/yr design speed                    165.       154.       177.
1.0E-6 1/yr design speed                    200.       189.       212.
1.0E-7 1/yr design speed                    231.       220.       244.

   38   97    3.737E+03 1.0000    179    135    135
Point  1.480E+00  7.145E-01  3.066E+00  1.321E-03  6.378E-04  2.737E-03
Line   6.047E+00  4.245E+00  8.613E+00  2.044E-04  1.435E-04  2.912E-04
Strike Probability, 1/yr               1.526E-03  7.813E-04  3.028E-03
1.0E-5 1/yr design speed                    167.       156.       178.
1.0E-6 1/yr design speed                    201.       191.       212.
1.0E-7 1/yr design speed                    233.       222.       245.

   38   98    3.737E+03 1.0000    179    130    130
Point  6.674E-01  3.999E-01  1.114E+00  5.957E-04  3.569E-04  9.944E-04
Line   4.113E+00  3.150E+00  5.371E+00  1.391E-04  1.065E-04  1.816E-04
Strike Probability, 1/yr               7.348E-04  4.634E-04  1.176E-03
1.0E-5 1/yr design speed                    156.       149.       164.
1.0E-6 1/yr design speed                    192.       184.       200.
1.0E-7 1/yr design speed                    224.       216.       233.

   38   99    3.737E+03 1.0000    150    108    108
Point  8.804E-01  4.680E-01  1.656E+00  6.585E-04  3.500E-04  1.239E-03
Line   7.107E+00  4.893E+00  1.032E+01  2.014E-04  1.386E-04  2.925E-04
Strike Probability, 1/yr               8.599E-04  4.887E-04  1.531E-03
1.0E-5 1/yr design speed                    160.       151.       169.
1.0E-6 1/yr design speed                    195.       186.       204.
1.0E-7 1/yr design speed                    227.       218.       237.
```

```
   38  100    3.737E+03 1.0000     89     72     72
Point  9.084E-01  3.396E-01  2.430E+00  4.031E-04  1.507E-04  1.078E-03
Line   5.902E+00  3.642E+00  9.566E+00  9.922E-05  6.122E-05  1.608E-04
Strike Probability, 1/yr               5.024E-04  2.119E-04  1.239E-03
1.0E-5 1/yr design speed                    150.       137.       164.
1.0E-6 1/yr design speed                    186.       174.       200.
1.0E-7 1/yr design speed                    219.       207.       233.

   38  101    3.737E+03 1.0000     96     77     77
Point  2.788E-01  1.048E-01  7.419E-01  1.335E-04  5.016E-05  3.551E-04
Line   2.788E+00  1.655E+00  4.696E+00  5.055E-05  3.000E-05  8.515E-05
Strike Probability, 1/yr               1.840E-04  8.016E-05  4.403E-04
1.0E-5 1/yr design speed                    134.       120.       149.
1.0E-6 1/yr design speed                    173.       161.       186.
1.0E-7 1/yr design speed                    207.       195.       220.

   38  102    3.737E+03 1.0000    128    106    106
Point  8.229E-02  4.738E-02  1.429E-01  5.252E-05  3.024E-05  9.122E-05
Line   1.177E+00  8.732E-01  1.586E+00  2.846E-05  2.111E-05  3.836E-05
Strike Probability, 1/yr               8.098E-05  5.136E-05  1.296E-04
1.0E-5 1/yr design speed                    115.       102.       128.
1.0E-6 1/yr design speed                    157.       144.       170.
1.0E-7 1/yr design speed                    194.       181.       207.

   38  103    3.737E+03 1.0000     53     43     43
Point  3.247E-01  1.045E-01  1.009E+00  8.582E-05  2.761E-05  2.668E-04
Line   3.216E+00  1.592E+00  6.497E+00  3.220E-05  1.594E-05  6.504E-05
Strike Probability, 1/yr               1.180E-04  4.355E-05  3.318E-04
1.0E-5 1/yr design speed                    122.        99.       145.
1.0E-6 1/yr design speed                    163.       141.       185.
1.0E-7 1/yr design speed                    200.       178.       221.

   38  104    3.737E+03 1.0000     55     48     48
Point  5.126E-02  2.395E-02  1.098E-01  1.406E-05  6.567E-06  3.010E-05
Line   9.959E-01  6.483E-01  1.530E+00  1.035E-05  6.735E-06  1.589E-05
Strike Probability, 1/yr               2.441E-05  1.330E-05  4.599E-05
1.0E-5 1/yr design speed                     90.        73.       107.
1.0E-6 1/yr design speed                    136.       121.       152.
1.0E-7 1/yr design speed                    176.       161.       191.

   38  105    3.737E+03 1.0000     15     11     11
Point  2.568E-02  7.629E-03  8.641E-02  1.921E-06  5.707E-07  6.464E-06
Line   5.251E-01  2.810E-01  9.814E-01  1.488E-06  7.961E-07  2.780E-06
Strike Probability, 1/yr               3.408E-06  1.367E-06  9.244E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     98.        75.       122.
1.0E-7 1/yr design speed                    142.       122.       164.

   38  106    3.737E+03 1.0000      3      3      3
Point  4.201E-01  2.411E-04  7.321E+02  6.285E-06  3.606E-09  1.095E-02
Line   2.686E+00  1.045E-01  6.901E+01  1.522E-06  5.923E-08  3.911E-05
Strike Probability, 1/yr               7.807E-06  6.284E-08  1.099E-02
1.0E-5 1/yr design speed                     60.        50.       203.
1.0E-6 1/yr design speed                    113.        50.       238.
1.0E-7 1/yr design speed                    155.        50.       272.

   38  107    3.737E+03 1.0000      0      0      0
```

```
   38  108    3.737E+03 1.0000      2      2      2
Point  2.114E-01  4.269E-03  1.047E+01  2.109E-06  4.258E-08  1.044E-04
Line   5.492E+00  2.382E-01  1.266E+02  2.075E-06  9.000E-08  4.784E-05
Strike Probability, 1/yr               4.184E-06  1.326E-07  1.523E-04
1.0E-5 1/yr design speed                     60.        60.       131.
1.0E-6 1/yr design speed                    102.        60.       173.
1.0E-7 1/yr design speed                    146.        74.       210.

   38  109    3.737E+03 1.0000      3      2      2
Point  2.167E-02  8.126E-03  5.781E-02  3.242E-07  1.216E-07  8.648E-07
Line   1.272E+00  4.767E-01  3.391E+00  7.205E-07  2.701E-07  1.922E-06
Strike Probability, 1/yr               1.045E-06  3.917E-07  2.787E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     67.        60.        98.
1.0E-7 1/yr design speed                    122.        99.       145.

   38  110    3.737E+03 1.0000      8      5      5
Point  7.673E-03  1.304E-03  4.515E-02  3.061E-07  5.202E-08  1.801E-06
Line   3.480E-01  1.691E-01  7.163E-01  5.259E-07  2.555E-07  1.082E-06
Strike Probability, 1/yr               8.319E-07  3.075E-07  2.883E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        97.
1.0E-7 1/yr design speed                    117.        94.       144.

   38  111    3.737E+03 1.0000      4      2      2
Point  3.594E-02  4.580E-04  2.821E+00  7.170E-07  9.135E-09  5.627E-05
Line   9.686E-01  6.836E-02  1.373E+01  7.318E-07  5.165E-08  1.037E-05
Strike Probability, 1/yr               1.449E-06  6.078E-08  6.664E-05
1.0E-5 1/yr design speed                     60.        50.       114.
1.0E-6 1/yr design speed                     77.        50.       157.
1.0E-7 1/yr design speed                    127.        50.       196.

   38  112    3.737E+03 1.0000      5      4      4
Point  1.121E-02  1.315E-03  9.553E-02  2.795E-07  3.279E-08  2.382E-06
Line   4.789E-01  1.400E-01  1.639E+00  4.523E-07  1.322E-07  1.548E-06
Strike Probability, 1/yr               7.318E-07  1.650E-07  3.930E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.       104.
1.0E-7 1/yr design speed                    114.        80.       150.

   38  113    3.737E+03 1.0000      2      2      2
Point  8.050E-02  9.677E-05  6.696E+01  8.028E-07  9.651E-10  6.678E-04
Line   4.789E+00  3.233E-02  7.096E+02  1.809E-06  1.221E-08  2.680E-04
Strike Probability, 1/yr               2.612E-06  1.318E-08  9.358E-04
1.0E-5 1/yr design speed                     60.        50.       164.
1.0E-6 1/yr design speed                     93.        50.       202.
1.0E-7 1/yr design speed                    139.        50.       237.

   38  114    3.737E+03 1.0000      1      1      1
Point  3.977E-02  0.000E+00  0.000E+00  1.983E-07  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  1.889E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr               3.872E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                     60.        50.        50.
1.0E-7 1/yr design speed                    101.        50.        50.

   38  115    3.737E+03 1.0000      0      0      0
```

```
   38  116    3.737E+03 1.0000      1      1      1
Point  1.705E-04  0.000E+00  0.000E+00  8.500E-10  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.889E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.974E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   38  117    3.737E+03 1.0000      1      1      1
Point  1.136E-03  0.000E+00  0.000E+00  5.667E-09  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  3.778E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                4.344E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   38  118    3.737E+03 1.0000      0      0      0

   38  119    3.737E+03 1.0000      1      1      1
Point  5.682E-03  0.000E+00  0.000E+00  2.833E-08  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  1.889E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.172E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      89.        50.        50.

   38  120    3.737E+03 1.0000      2      0      0

   38  121    3.737E+03 1.0000     15     14     14
Point  1.278E-02  5.349E-03  3.054E-02  9.560E-07  4.001E-07  2.284E-06
Line   4.777E-01  2.732E-01  8.350E-01  1.353E-06  7.742E-07  2.366E-06
Strike Probability, 1/yr                2.309E-06  1.174E-06  4.650E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      89.        70.       108.
1.0E-7 1/yr design speed                     136.       120.       153.

   38  122    3.737E+03 1.0000     11     11     11
Point  1.428E-01  3.805E-02  5.356E-01  7.831E-06  2.087E-06  2.938E-05
Line   3.534E+00  1.484E+00  8.415E+00  7.342E-06  3.083E-06  1.749E-05
Strike Probability, 1/yr                1.517E-05  5.171E-06  4.687E-05
1.0E-5 1/yr design speed                      78.        60.       108.
1.0E-6 1/yr design speed                     128.       104.       153.
1.0E-7 1/yr design speed                     168.       146.       191.

   38  123    1.495E+03 0.4000      2      1      1
Point  1.420E-02  0.000E+00  0.000E+00  3.542E-07  0.000E+00  0.000E+00
Line   5.000E-01  0.000E+00  0.000E+00  4.722E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                8.264E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     117.        50.        50.

   39   73    1.842E+02 0.0500      0      0      0
```

```
   39   74    2.210E+03 0.6000     27     26     26
Point  2.463E-01  7.365E-02  8.240E-01  5.606E-05  1.676E-05  1.875E-04
Line   3.208E+00  1.461E+00  7.040E+00  2.765E-05  1.260E-05  6.069E-05
Strike Probability, 1/yr               8.372E-05  2.936E-05  2.482E-04
1.0E-5 1/yr design speed                   117.        95.       137.
1.0E-6 1/yr design speed                   158.       140.       176.
1.0E-7 1/yr design speed                   193.       176.       211.

   39   75    3.684E+03 1.0000     86     79     79
Point  2.957E-01  1.446E-01  6.048E-01  1.286E-04  6.288E-05  2.630E-04
Line   2.195E+00  1.554E+00  3.101E+00  3.617E-05  2.561E-05  5.108E-05
Strike Probability, 1/yr               1.648E-04  8.849E-05  3.141E-04
1.0E-5 1/yr design speed                   128.       116.       140.
1.0E-6 1/yr design speed                   167.       156.       179.
1.0E-7 1/yr design speed                   203.       191.       214.

   39   76    3.684E+03 1.0000     69     60     60
Point  3.894E-01  1.603E-01  9.458E-01  1.359E-04  5.596E-05  3.301E-04
Line   2.672E+00  1.738E+00  4.106E+00  3.531E-05  2.298E-05  5.428E-05
Strike Probability, 1/yr               1.712E-04  7.893E-05  3.843E-04
1.0E-5 1/yr design speed                   129.       114.       144.
1.0E-6 1/yr design speed                   168.       154.       182.
1.0E-7 1/yr design speed                   203.       190.       218.

   39   77    3.684E+03 1.0000     83     78     78
Point  1.258E-01  7.842E-02  2.020E-01  5.283E-05  3.292E-05  8.478E-05
Line   1.906E+00  1.462E+00  2.485E+00  3.031E-05  2.324E-05  3.952E-05
Strike Probability, 1/yr               8.313E-05  5.616E-05  1.243E-04
1.0E-5 1/yr design speed                   117.       109.       126.
1.0E-6 1/yr design speed                   158.       150.       165.
1.0E-7 1/yr design speed                   193.       185.       201.

   39   78    3.684E+03 1.0000     28     26     26
Point  2.564E-01  1.240E-01  5.303E-01  3.631E-05  1.756E-05  7.509E-05
Line   2.627E+00  1.837E+00  3.759E+00  1.409E-05  9.851E-06  2.016E-05
Strike Probability, 1/yr               5.041E-05  2.741E-05  9.525E-05
1.0E-5 1/yr design speed                   109.        96.       121.
1.0E-6 1/yr design speed                   152.       143.       162.
1.0E-7 1/yr design speed                   188.       180.       198.

   39   79    3.684E+03 1.0000     39     33     33
Point  2.352E+00  5.746E-01  9.628E+00  4.639E-04  1.133E-04  1.899E-03
Line   6.653E+00  3.746E+00  1.181E+01  4.970E-05  2.799E-05  8.827E-05
Strike Probability, 1/yr               5.136E-04  1.413E-04  1.987E-03
1.0E-5 1/yr design speed                   148.       128.       170.
1.0E-6 1/yr design speed                   184.       166.       205.
1.0E-7 1/yr design speed                   217.       200.       238.

   39   80    3.684E+03 1.0000     26     19     19
Point  2.694E-01  7.219E-02  1.006E+00  3.543E-05  9.492E-06  1.322E-04
Line   2.739E+00  1.326E+00  5.660E+00  1.364E-05  6.604E-06  2.819E-05
Strike Probability, 1/yr               4.907E-05  1.610E-05  1.604E-04
1.0E-5 1/yr design speed                   108.        82.       130.
1.0E-6 1/yr design speed                   152.       134.       170.
1.0E-7 1/yr design speed                   188.       173.       205.
```

```
   39   81    3.684E+03 1.0000     30     25     25
Point  1.641E-01  8.022E-02  3.356E-01  2.489E-05  1.217E-05  5.092E-05
Line   2.683E+00  1.733E+00  4.154E+00  1.542E-05  9.960E-06  2.387E-05
Strike Probability, 1/yr               4.031E-05  2.213E-05  7.479E-05
1.0E-5 1/yr design speed                    106.        92.       118.
1.0E-6 1/yr design speed                    151.       141.       160.
1.0E-7 1/yr design speed                    187.       178.       196.

   39   82    3.684E+03 1.0000     48     36     36
Point  1.330E+00  4.073E-01  4.345E+00  3.229E-04  9.887E-05  1.055E-03
Line   7.075E+00  3.607E+00  1.388E+01  6.506E-05  3.317E-05  1.276E-04
Strike Probability, 1/yr               3.880E-04  1.320E-04  1.182E-03
1.0E-5 1/yr design speed                    145.       128.       163.
1.0E-6 1/yr design speed                    182.       166.       199.
1.0E-7 1/yr design speed                    215.       200.       232.

   39   83    3.684E+03 1.0000     80     67     67
Point  1.584E+00  6.671E-01  3.763E+00  6.410E-04  2.699E-04  1.522E-03
Line   6.866E+00  4.446E+00  1.060E+01  1.052E-04  6.814E-05  1.625E-04
Strike Probability, 1/yr               7.463E-04  3.381E-04  1.685E-03
1.0E-5 1/yr design speed                    155.       143.       168.
1.0E-6 1/yr design speed                    191.       179.       204.
1.0E-7 1/yr design speed                    223.       211.       237.

   39   84    3.684E+03 1.0000    117     99     99
Point  1.524E+00  6.902E-01  3.365E+00  9.018E-04  4.084E-04  1.991E-03
Line   4.298E+00  2.997E+00  6.166E+00  9.635E-05  6.717E-05  1.382E-04
Strike Probability, 1/yr               9.981E-04  4.756E-04  2.129E-03
1.0E-5 1/yr design speed                    159.       147.       171.
1.0E-6 1/yr design speed                    194.       183.       207.
1.0E-7 1/yr design speed                    226.       214.       240.

   39   85    3.684E+03 1.0000    159    125    125
Point  1.917E+00  8.860E-01  4.150E+00  1.542E-03  7.124E-04  3.337E-03
Line   6.454E+00  4.423E+00  9.416E+00  1.966E-04  1.347E-04  2.868E-04
Strike Probability, 1/yr               1.739E-03  8.472E-04  3.624E-03
1.0E-5 1/yr design speed                    168.       157.       180.
1.0E-6 1/yr design speed                    202.       191.       215.
1.0E-7 1/yr design speed                    234.       223.       247.

   39   86    3.684E+03 1.0000    138     99     99
Point  9.875E-01  4.781E-01  2.039E+00  6.892E-04  3.337E-04  1.423E-03
Line   7.162E+00  4.682E+00  1.096E+01  1.893E-04  1.238E-04  2.896E-04
Strike Probability, 1/yr               8.785E-04  4.575E-04  1.713E-03
1.0E-5 1/yr design speed                    160.       150.       171.
1.0E-6 1/yr design speed                    195.       185.       206.
1.0E-7 1/yr design speed                    227.       217.       238.

   39   87    3.684E+03 1.0000    103     91     91
Point  3.396E-01  1.406E-01  8.207E-01  1.769E-04  7.322E-05  4.275E-04
Line   2.710E+00  1.737E+00  4.228E+00  5.348E-05  3.428E-05  8.342E-05
Strike Probability, 1/yr               2.304E-04  1.075E-04  5.110E-04
1.0E-5 1/yr design speed                    137.       125.       151.
1.0E-6 1/yr design speed                    176.       164.       187.
1.0E-7 1/yr design speed                    209.       198.       221.
```

```
   39   88    3.684E+03 1.0000    145    118    118
Point  1.744E+00  7.011E-01  4.337E+00  1.279E-03  5.142E-04  3.180E-03
Line   5.928E+00  3.827E+00  9.182E+00  1.647E-04  1.063E-04  2.550E-04
Strike Probability, 1/yr                1.443E-03  6.205E-04  3.435E-03
1.0E-5 1/yr design speed                     165.       152.       179.
1.0E-6 1/yr design speed                     200.       187.       214.
1.0E-7 1/yr design speed                     231.       219.       246.

   39   89    3.684E+03 1.0000    139    117    117
Point  1.065E+00  4.574E-01  2.478E+00  7.484E-04  3.216E-04  1.742E-03
Line   6.743E+00  4.309E+00  1.055E+01  1.796E-04  1.147E-04  2.810E-04
Strike Probability, 1/yr                9.280E-04  4.363E-04  2.023E-03
1.0E-5 1/yr design speed                     160.       149.       173.
1.0E-6 1/yr design speed                     195.       184.       207.
1.0E-7 1/yr design speed                     227.       216.       240.

   39   90    3.684E+03 1.0000     82     76     76
Point  7.121E-01  3.266E-01  1.553E+00  2.953E-04  1.354E-04  6.440E-04
Line   6.850E+00  4.202E+00  1.116E+01  1.076E-04  6.601E-05  1.754E-04
Strike Probability, 1/yr                4.029E-04  2.014E-04  8.194E-04
1.0E-5 1/yr design speed                     148.       137.       160.
1.0E-6 1/yr design speed                     185.       175.       196.
1.0E-7 1/yr design speed                     217.       207.       229.

   39   91    3.684E+03 1.0000     66     64     64
Point  3.517E-01  1.737E-01  7.121E-01  1.174E-04  5.799E-05  2.377E-04
Line   4.783E+00  3.024E+00  7.564E+00  6.048E-05  3.824E-05  9.564E-05
Strike Probability, 1/yr                1.779E-04  9.623E-05  3.333E-04
1.0E-5 1/yr design speed                     135.       125.       146.
1.0E-6 1/yr design speed                     174.       164.       184.
1.0E-7 1/yr design speed                     207.       198.       217.

   39   92    3.684E+03 1.0000     74     68     68
Point  2.873E+00  7.571E-01  1.090E+01  1.075E-03  2.833E-04  4.080E-03
Line   6.516E+00  3.636E+00  1.168E+01  9.238E-05  5.155E-05  1.655E-04
Strike Probability, 1/yr                1.168E-03  3.349E-04  4.246E-03
1.0E-5 1/yr design speed                     161.       141.       181.
1.0E-6 1/yr design speed                     196.       178.       216.
1.0E-7 1/yr design speed                     228.       210.       249.

   39   93    3.684E+03 1.0000     88     83     83
Point  1.405E+00  4.873E-01  4.050E+00  6.253E-04  2.169E-04  1.803E-03
Line   6.321E+00  3.842E+00  1.040E+01  1.066E-04  6.478E-05  1.753E-04
Strike Probability, 1/yr                7.318E-04  2.817E-04  1.978E-03
1.0E-5 1/yr design speed                     155.       140.       171.
1.0E-6 1/yr design speed                     191.       177.       206.
1.0E-7 1/yr design speed                     223.       209.       239.

   39   94    3.684E+03 1.0000    159    146    150
Point  8.322E-01  4.334E-01  1.598E+00  6.692E-04  3.485E-04  1.285E-03
Line   5.172E+00  3.691E+00  7.247E+00  1.576E-04  1.124E-04  2.208E-04
Strike Probability, 1/yr                8.268E-04  4.610E-04  1.506E-03
1.0E-5 1/yr design speed                     158.       149.       168.
1.0E-6 1/yr design speed                     193.       185.       203.
1.0E-7 1/yr design speed                     226.       216.       236.
```

```
   39   95    3.684E+03 1.0000    183    140    140
Point  3.916E+00  1.741E+00  8.809E+00  3.625E-03  1.611E-03  8.153E-03
Line   9.616E+00  6.511E+00  1.420E+01  3.371E-04  2.283E-04  4.979E-04
Strike Probability, 1/yr               3.962E-03  1.840E-03  8.651E-03
1.0E-5 1/yr design speed                    180.       168.       193.
1.0E-6 1/yr design speed                    213.       201.       227.
1.0E-7 1/yr design speed                    244.       232.       259.

   39   96    3.684E+03 1.0000    119     95     95
Point  1.181E+00  5.164E-01  2.703E+00  7.110E-04  3.108E-04  1.627E-03
Line   6.515E+00  4.212E+00  1.008E+01  1.485E-04  9.603E-05  2.297E-04
Strike Probability, 1/yr               8.596E-04  4.069E-04  1.856E-03
1.0E-5 1/yr design speed                    158.       147.       171.
1.0E-6 1/yr design speed                    194.       183.       206.
1.0E-7 1/yr design speed                    226.       214.       238.

   39   97    3.684E+03 1.0000    141    118    118
Point  1.830E+00  8.380E-01  3.998E+00  1.305E-03  5.976E-04  2.851E-03
Line   7.588E+00  5.159E+00  1.116E+01  2.050E-04  1.394E-04  3.015E-04
Strike Probability, 1/yr               1.510E-03  7.369E-04  3.153E-03
1.0E-5 1/yr design speed                    166.       155.       178.
1.0E-6 1/yr design speed                    201.       190.       213.
1.0E-7 1/yr design speed                    232.       221.       245.

   39   98    3.684E+03 1.0000    135    118    118
Point  1.031E+00  5.390E-01  1.973E+00  7.041E-04  3.680E-04  1.347E-03
Line   5.816E+00  4.291E+00  7.884E+00  1.504E-04  1.110E-04  2.039E-04
Strike Probability, 1/yr               8.546E-04  4.790E-04  1.551E-03
1.0E-5 1/yr design speed                    158.       150.       168.
1.0E-6 1/yr design speed                    194.       185.       203.
1.0E-7 1/yr design speed                    226.       216.       236.

   39   99    3.684E+03 1.0000    121    100    100
Point  3.235E+00  1.169E+00  8.955E+00  1.980E-03  7.152E-04  5.480E-03
Line   6.376E+00  3.995E+00  1.018E+01  1.478E-04  9.262E-05  2.359E-04
Strike Probability, 1/yr               2.128E-03  8.078E-04  5.716E-03
1.0E-5 1/yr design speed                    170.       155.       186.
1.0E-6 1/yr design speed                    204.       189.       220.
1.0E-7 1/yr design speed                    236.       221.       253.

   39  100    3.684E+03 1.0000    103     77     77
Point  3.792E-01  1.609E-01  8.936E-01  1.975E-04  8.381E-05  4.655E-04
Line   2.905E+00  1.891E+00  4.464E+00  5.733E-05  3.731E-05  8.808E-05
Strike Probability, 1/yr               2.548E-04  1.211E-04  5.536E-04
1.0E-5 1/yr design speed                    139.       127.       152.
1.0E-6 1/yr design speed                    177.       166.       189.
1.0E-7 1/yr design speed                    210.       200.       222.

   39  101    3.684E+03 1.0000    155    118    118
Point  2.246E-01  1.128E-01  4.472E-01  1.761E-04  8.845E-05  3.506E-04
Line   1.684E+00  1.207E+00  2.348E+00  4.999E-05  3.584E-05  6.972E-05
Strike Probability, 1/yr               2.261E-04  1.243E-04  4.203E-04
1.0E-5 1/yr design speed                    137.       127.       147.
1.0E-6 1/yr design speed                    175.       166.       185.
1.0E-7 1/yr design speed                    208.       200.       218.
```

```
   39  102    3.684E+03 1.0000     85     65     65
Point  7.198E-02  3.509E-02  1.477E-01  3.094E-05  1.508E-05  6.348E-05
Line   1.369E+00  9.047E-01  2.072E+00  2.229E-05  1.473E-05  3.374E-05
Strike Probability, 1/yr                5.324E-05  2.981E-05  9.722E-05
1.0E-5 1/yr design speed                     107.        92.       123.
1.0E-6 1/yr design speed                     150.       135.       165.
1.0E-7 1/yr design speed                     188.       174.       203.

   39  103    3.684E+03 1.0000    112    100    100
Point  5.918E-02  3.240E-02  1.081E-01  3.352E-05  1.835E-05  6.123E-05
Line   7.877E-01  5.832E-01  1.064E+00  1.690E-05  1.251E-05  2.283E-05
Strike Probability, 1/yr                5.042E-05  3.087E-05  8.406E-05
1.0E-5 1/yr design speed                     105.        92.       119.
1.0E-6 1/yr design speed                     149.       135.       162.
1.0E-7 1/yr design speed                     187.       173.       200.

   39  104    3.684E+03 1.0000    310    280    280
Point  3.623E-02  2.700E-02  4.862E-02  5.681E-05  4.233E-05  7.622E-05
Line   7.154E-01  6.111E-01  8.374E-01  4.248E-05  3.629E-05  4.973E-05
Strike Probability, 1/yr                9.929E-05  7.863E-05  1.260E-04
1.0E-5 1/yr design speed                     119.       111.       128.
1.0E-6 1/yr design speed                     161.       152.       170.
1.0E-7 1/yr design speed                     198.       188.       207.

   39  105    3.684E+03 1.0000     25     19     19
Point  1.558E-02  6.383E-03  3.805E-02  1.970E-06  8.070E-07  4.811E-06
Line   3.416E-01  2.297E-01  5.079E-01  1.636E-06  1.100E-06  2.432E-06
Strike Probability, 1/yr                3.606E-06  1.907E-06  7.244E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      99.        82.       117.
1.0E-7 1/yr design speed                     143.       128.       160.

   39  106    3.684E+03 1.0000      1      1      1
Point  1.875E-03  0.000E+00  0.000E+00  9.483E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.916E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.864E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   39  107    3.684E+03 1.0000      1      1      1
Point  2.841E-02  0.000E+00  0.000E+00  1.437E-07  0.000E+00  0.000E+00
Line   5.000E-01  0.000E+00  0.000E+00  9.579E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.395E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      89.        50.        50.

   39  108    3.684E+03 1.0000      4      3      4
Point  5.722E-03  3.602E-03  9.089E-03  1.158E-07  7.286E-08  1.839E-07
Line   2.212E-01  1.193E-01  4.100E-01  1.695E-07  9.142E-08  3.142E-07
Strike Probability, 1/yr                2.852E-07  1.643E-07  4.981E-07
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        60.
1.0E-7 1/yr design speed                      94.        79.       110.

   39  109    3.684E+03 1.0000      0      0      0
```

```
   39  110    3.684E+03 1.0000      3      3      3
Point  3.010E-01  6.628E-04  1.367E+02  4.567E-06  1.006E-08  2.074E-03
Line   3.911E+00  1.543E-01  9.913E+01  2.248E-06  8.867E-08  5.697E-05
Strike Probability, 1/yr               6.814E-06  9.873E-08  2.131E-03
1.0E-5 1/yr design speed                     60.        50.       176.
1.0E-6 1/yr design speed                    111.        50.       213.
1.0E-7 1/yr design speed                    154.        50.       248.

   39  111    3.684E+03 1.0000     10      6      6
Point  5.385E-01  8.640E-03  3.356E+01  2.724E-05  4.370E-07  1.697E-03
Line   1.636E+00  4.151E-01  6.447E+00  3.134E-06  7.952E-07  1.235E-05
Strike Probability, 1/yr               3.037E-05  1.232E-06  1.710E-03
1.0E-5 1/yr design speed                     93.        60.       173.
1.0E-6 1/yr design speed                    138.        72.       210.
1.0E-7 1/yr design speed                    177.       121.       245.

   39  112    3.684E+03 1.0000      2      2      2
Point  1.707E-03  1.114E-03  2.615E-03  1.726E-08  1.127E-08  2.645E-08
Line   2.000E-01  0.000E+00  0.000E+00  7.663E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr               9.389E-08  1.127E-08  2.645E-08
1.0E-5 1/yr design speed                     50.        50.        50.
1.0E-6 1/yr design speed                     50.        50.        50.
1.0E-7 1/yr design speed                     50.        50.        50.

   39  113    3.684E+03 1.0000      0      0      0

   39  114    3.684E+03 1.0000      6      2      4
Point  1.707E-03  1.114E-03  2.615E-03  5.179E-08  3.380E-08  7.934E-08
Line   1.759E-01  1.364E-01  2.268E-01  2.022E-07  1.568E-07  2.607E-07
Strike Probability, 1/yr               2.540E-07  1.906E-07  3.401E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     92.        83.       103.

   39  115    3.684E+03 1.0000      1      0      0

   39  116    3.684E+03 1.0000      0      0      0

   39  117    3.684E+03 1.0000      0      0      0

   39  118    3.684E+03 1.0000      4      2      2
Point  3.578E-02  1.575E-04  8.125E+00  7.238E-07  3.187E-09  1.644E-04
Line   2.326E+00  4.696E-02  1.152E+02  1.782E-06  3.599E-08  8.826E-05
Strike Probability, 1/yr               2.506E-06  3.917E-08  2.526E-04
1.0E-5 1/yr design speed                     60.        50.       141.
1.0E-6 1/yr design speed                     92.        50.       181.
1.0E-7 1/yr design speed                    139.        50.       217.

   39  119    3.684E+03 1.0000     12      9      9
Point  8.187E-02  1.173E-02  5.715E-01  4.969E-06  7.119E-07  3.468E-05
Line   2.369E+00  6.106E-01  9.192E+00  5.446E-06  1.404E-06  2.113E-05
Strike Probability, 1/yr               1.042E-05  2.116E-06  5.581E-05
1.0E-5 1/yr design speed                     66.        60.       111.
1.0E-6 1/yr design speed                    121.        85.       156.
1.0E-7 1/yr design speed                    162.       131.       194.
```

```
   39  120    3.684E+03 1.0000      1      1      1
Point  5.682E-04  0.000E+00  0.000E+00  2.874E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.916E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.203E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   39  121    3.684E+03 1.0000      8      6      6
Point  8.725E-02  8.392E-03  9.071E-01  3.530E-06  3.395E-07  3.670E-05
Line   2.305E+00  4.905E-01  1.084E+01  3.533E-06  7.517E-07  1.661E-05
Strike Probability, 1/yr                7.063E-06  1.091E-06  5.331E-05
1.0E-5 1/yr design speed                      60.        60.       110.
1.0E-6 1/yr design speed                     113.        68.       155.
1.0E-7 1/yr design speed                     156.       119.       193.

   39  122    3.684E+03 1.0000      4      3      4
Point  5.866E-02  1.411E-02  2.439E-01  1.187E-06  2.855E-07  4.933E-06
Line   1.227E+00  3.345E-01  4.501E+00  9.403E-07  2.563E-07  3.449E-06
Strike Probability, 1/yr                2.127E-06  5.418E-07  8.382E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      86.        60.       120.
1.0E-7 1/yr design speed                     134.       104.       163.

   39  123    3.316E+03 0.9000      2      2      2
Point  2.068E-01  4.221E-02  1.013E+00  2.325E-06  4.744E-07  1.139E-05
Line   1.850E+00  1.683E+00  2.034E+00  7.876E-07  7.163E-07  8.659E-07
Strike Probability, 1/yr                3.112E-06  1.191E-06  1.225E-05
1.0E-5 1/yr design speed                      60.        60.        73.
1.0E-6 1/yr design speed                      94.        70.       126.
1.0E-7 1/yr design speed                     139.       120.       167.

   39  124    1.842E+02 0.0500      0      0      0

   40   71    1.815E+02 0.0500      0      0      0

   40   72    7.261E+02 0.2000      9      8      8
Point  6.666E-03  4.471E-03  9.939E-03  1.540E-06  1.033E-06  2.295E-06
Line   6.305E-01  2.720E-01  1.461E+00  5.516E-06  2.380E-06  1.279E-05
Strike Probability, 1/yr                7.055E-06  3.412E-06  1.508E-05
1.0E-5 1/yr design speed                      60.        60.        83.
1.0E-6 1/yr design speed                     119.       102.       136.
1.0E-7 1/yr design speed                     159.       145.       172.

   40   73    1.089E+03 0.3000     16     14     14
Point  7.568E-02  3.162E-02  1.812E-01  2.072E-05  8.654E-06  4.959E-05
Line   1.370E+00  6.732E-01  2.788E+00  1.420E-05  6.980E-06  2.891E-05
Strike Probability, 1/yr                3.492E-05  1.563E-05  7.850E-05
1.0E-5 1/yr design speed                     100.        80.       118.
1.0E-6 1/yr design speed                     144.       129.       159.
1.0E-7 1/yr design speed                     180.       167.       194.
```

```
   40   74    3.631E+03 1.0000     78     74     74
Point  3.554E-01  1.771E-01  7.131E-01  1.423E-04  7.089E-05  2.854E-04
Line   2.762E+00  1.944E+00  3.926E+00  4.188E-05  2.947E-05  5.953E-05
Strike Probability, 1/yr               1.841E-04  1.004E-04  3.450E-04
1.0E-5 1/yr design speed                    130.       119.       142.
1.0E-6 1/yr design speed                    169.       158.       180.
1.0E-7 1/yr design speed                    204.       193.       216.

   40   75    3.631E+03 1.0000     83     77     77
Point  2.703E-01  1.531E-01  4.770E-01  1.151E-04  6.523E-05  2.032E-04
Line   2.705E+00  2.053E+00  3.564E+00  4.365E-05  3.313E-05  5.751E-05
Strike Probability, 1/yr               1.588E-04  9.836E-05  2.607E-04
1.0E-5 1/yr design speed                    128.       119.       138.
1.0E-6 1/yr design speed                    167.       158.       177.
1.0E-7 1/yr design speed                    202.       193.       212.

   40   76    3.631E+03 1.0000     77     67     67
Point  2.751E-01  1.431E-01  5.286E-01  1.087E-04  5.656E-05  2.089E-04
Line   2.834E+00  1.988E+00  4.040E+00  4.242E-05  2.976E-05  6.047E-05
Strike Probability, 1/yr               1.511E-04  8.632E-05  2.694E-04
1.0E-5 1/yr design speed                    128.       116.       139.
1.0E-6 1/yr design speed                    166.       156.       177.
1.0E-7 1/yr design speed                    202.       191.       212.

   40   77    3.631E+03 1.0000     37     30     30
Point  5.556E-01  1.579E-01  1.955E+00  1.055E-04  2.998E-05  3.712E-04
Line   2.383E+00  1.543E+00  3.681E+00  1.714E-05  1.110E-05  2.648E-05
Strike Probability, 1/yr               1.226E-04  4.108E-05  3.977E-04
1.0E-5 1/yr design speed                    122.       101.       143.
1.0E-6 1/yr design speed                    162.       143.       182.
1.0E-7 1/yr design speed                    198.       180.       218.

   40   78    3.631E+03 1.0000     45     37     37
Point  2.685E-01  1.412E-01  5.105E-01  6.201E-05  3.261E-05  1.179E-04
Line   3.419E+00  2.303E+00  5.076E+00  2.991E-05  2.015E-05  4.441E-05
Strike Probability, 1/yr               9.192E-05  5.276E-05  1.623E-04
1.0E-5 1/yr design speed                    122.       111.       132.
1.0E-6 1/yr design speed                    163.       154.       172.
1.0E-7 1/yr design speed                    198.       189.       207.

   40   79    3.631E+03 1.0000     71     58     58
Point  6.091E-01  2.692E-01  1.378E+00  2.219E-04  9.810E-05  5.021E-04
Line   4.160E+00  2.710E+00  6.385E+00  5.742E-05  3.741E-05  8.812E-05
Strike Probability, 1/yr               2.793E-04  1.355E-04  5.902E-04
1.0E-5 1/yr design speed                    140.       128.       153.
1.0E-6 1/yr design speed                    178.       167.       189.
1.0E-7 1/yr design speed                    211.       201.       223.

   40   80    3.631E+03 1.0000     58     50     50
Point  4.381E-01  1.627E-01  1.180E+00  1.304E-04  4.842E-05  3.512E-04
Line   3.311E+00  2.048E+00  5.354E+00  3.733E-05  2.309E-05  6.037E-05
Strike Probability, 1/yr               1.677E-04  7.151E-05  4.115E-04
1.0E-5 1/yr design speed                    132.       117.       146.
1.0E-6 1/yr design speed                    170.       158.       184.
1.0E-7 1/yr design speed                    204.       193.       218.
```

```
   40   81    3.631E+03 1.0000     57     46     46
Point  5.248E-01  2.131E-01  1.292E+00  1.535E-04  6.235E-05  3.781E-04
Line   3.317E+00  2.102E+00  5.235E+00  3.676E-05  2.329E-05  5.800E-05
Strike Probability, 1/yr               1.903E-04  8.564E-05  4.361E-04
1.0E-5 1/yr design speed                    133.       120.       147.
1.0E-6 1/yr design speed                    172.       160.       184.
1.0E-7 1/yr design speed                    205.       194.       218.

   40   82    3.631E+03 1.0000    104     89     89
Point  9.209E-01  4.443E-01  1.909E+00  4.915E-04  2.371E-04  1.019E-03
Line   5.973E+00  3.970E+00  8.986E+00  1.208E-04  8.026E-05  1.817E-04
Strike Probability, 1/yr               6.123E-04  3.174E-04  1.200E-03
1.0E-5 1/yr design speed                    154.       143.       164.
1.0E-6 1/yr design speed                    189.       179.       200.
1.0E-7 1/yr design speed                    222.       211.       233.

   40   83    3.631E+03 1.0000     77     66     66
Point  7.983E-01  3.300E-01  1.931E+00  3.155E-04  1.304E-04  7.631E-04
Line   3.824E+00  2.396E+00  6.103E+00  5.724E-05  3.587E-05  9.136E-05
Strike Probability, 1/yr               3.727E-04  1.663E-04  8.545E-04
1.0E-5 1/yr design speed                    144.       131.       158.
1.0E-6 1/yr design speed                    181.       169.       194.
1.0E-7 1/yr design speed                    214.       202.       227.

   40   84    3.631E+03 1.0000    101     83     84
Point  1.048E+00  4.203E-01  2.611E+00  5.430E-04  2.179E-04  1.353E-03
Line   5.858E+00  3.639E+00  9.430E+00  1.150E-04  7.145E-05  1.851E-04
Strike Probability, 1/yr               6.580E-04  2.893E-04  1.538E-03
1.0E-5 1/yr design speed                    154.       141.       168.
1.0E-6 1/yr design speed                    190.       178.       203.
1.0E-7 1/yr design speed                    222.       210.       236.

   40   85    3.631E+03 1.0000    138     98     98
Point  1.347E+00  5.441E-01  3.337E+00  9.543E-04  3.854E-04  2.363E-03
Line   7.056E+00  4.498E+00  1.107E+01  1.893E-04  1.207E-04  2.969E-04
Strike Probability, 1/yr               1.144E-03  5.061E-04  2.660E-03
1.0E-5 1/yr design speed                    163.       151.       176.
1.0E-6 1/yr design speed                    198.       186.       211.
1.0E-7 1/yr design speed                    229.       217.       243.

   40   86    3.631E+03 1.0000    148    103    103
Point  2.321E+00  9.496E-01  5.673E+00  1.763E-03  7.213E-04  4.309E-03
Line   7.227E+00  4.768E+00  1.095E+01  2.079E-04  1.372E-04  3.152E-04
Strike Probability, 1/yr               1.971E-03  8.585E-04  4.624E-03
1.0E-5 1/yr design speed                    170.       157.       184.
1.0E-6 1/yr design speed                    204.       191.       218.
1.0E-7 1/yr design speed                    235.       223.       250.

   40   87    3.631E+03 1.0000    101     79     79
Point  1.669E+00  5.440E-01  5.121E+00  8.652E-04  2.820E-04  2.655E-03
Line   4.886E+00  2.951E+00  8.090E+00  9.594E-05  5.795E-05  1.588E-04
Strike Probability, 1/yr               9.611E-04  3.399E-04  2.814E-03
1.0E-5 1/yr design speed                    158.       142.       176.
1.0E-6 1/yr design speed                    193.       178.       210.
1.0E-7 1/yr design speed                    226.       211.       243.
```

```
   40   88    3.631E+03 1.0000    175    146    146
Point  1.035E+00  4.726E-01  2.266E+00  9.294E-04  4.244E-04  2.035E-03
Line   5.656E+00  3.788E+00  8.445E+00  1.924E-04  1.289E-04  2.873E-04
Strike Probability, 1/yr                1.122E-03  5.533E-04  2.323E-03
1.0E-5 1/yr design speed                     163.       152.       174.
1.0E-6 1/yr design speed                     198.       187.       209.
1.0E-7 1/yr design speed                     229.       218.       242.

   40   89    3.631E+03 1.0000    178    148    148
Point  1.583E+00  6.853E-01  3.659E+00  1.447E-03  6.260E-04  3.342E-03
Line   5.514E+00  3.719E+00  8.176E+00  1.908E-04  1.287E-04  2.829E-04
Strike Probability, 1/yr                1.637E-03  7.547E-04  3.625E-03
1.0E-5 1/yr design speed                     167.       155.       180.
1.0E-6 1/yr design speed                     202.       190.       215.
1.0E-7 1/yr design speed                     233.       221.       247.

   40   90    3.631E+03 1.0000    142    115    115
Point  7.106E+00  2.156E+00  2.342E+01  5.179E-03  1.571E-03  1.707E-02
Line   9.697E+00  6.086E+00  1.545E+01  2.677E-04  1.680E-04  4.265E-04
Strike Probability, 1/yr                5.447E-03  1.739E-03  1.750E-02
1.0E-5 1/yr design speed                     184.       166.       203.
1.0E-6 1/yr design speed                     217.       200.       236.
1.0E-7 1/yr design speed                     248.       230.       268.

   40   91    3.631E+03 1.0000    114     95     95
Point  4.694E+00  1.496E+00  1.473E+01  2.747E-03  8.751E-04  8.620E-03
Line   1.358E+01  7.532E+00  2.450E+01  3.010E-04  1.669E-04  5.429E-04
Strike Probability, 1/yr                3.048E-03  1.042E-03  9.163E-03
1.0E-5 1/yr design speed                     176.       160.       194.
1.0E-6 1/yr design speed                     210.       194.       228.
1.0E-7 1/yr design speed                     241.       225.       260.

   40   92    3.631E+03 1.0000     76     73     73
Point  1.103E+00  4.778E-01  2.544E+00  4.300E-04  1.864E-04  9.922E-04
Line   7.382E+00  4.900E+00  1.112E+01  1.091E-04  7.240E-05  1.643E-04
Strike Probability, 1/yr                5.391E-04  2.588E-04  1.157E-03
1.0E-5 1/yr design speed                     152.       140.       164.
1.0E-6 1/yr design speed                     187.       177.       199.
1.0E-7 1/yr design speed                     220.       209.       232.

   40   93    3.631E+03 1.0000     86     79     79
Point  2.396E+00  7.865E-01  7.296E+00  1.057E-03  3.472E-04  3.220E-03
Line   7.569E+00  4.530E+00  1.265E+01  1.265E-04  7.573E-05  2.115E-04
Strike Probability, 1/yr                1.184E-03  4.229E-04  3.432E-03
1.0E-5 1/yr design speed                     162.       146.       179.
1.0E-6 1/yr design speed                     197.       182.       213.
1.0E-7 1/yr design speed                     229.       214.       246.

   40   94    3.631E+03 1.0000    106     95     95
Point  3.452E+00  1.261E+00  9.447E+00  1.878E-03  6.861E-04  5.139E-03
Line   7.770E+00  4.985E+00  1.211E+01  1.601E-04  1.027E-04  2.496E-04
Strike Probability, 1/yr                2.038E-03  7.888E-04  5.389E-03
1.0E-5 1/yr design speed                     170.       155.       185.
1.0E-6 1/yr design speed                     204.       189.       220.
1.0E-7 1/yr design speed                     235.       221.       252.
```

```
   40   95    3.631E+03 1.0000    128    113    113
Point  1.585E+00  6.673E-01  3.766E+00  1.041E-03  4.384E-04  2.474E-03
Line   5.695E+00  3.786E+00  8.565E+00  1.417E-04  9.421E-05  2.131E-04
Strike Probability, 1/yr                1.183E-03  5.326E-04  2.687E-03
1.0E-5 1/yr design speed                     162.       150.       176.
1.0E-6 1/yr design speed                     197.       185.       210.
1.0E-7 1/yr design speed                     229.       217.       243.

   40   96    3.631E+03 1.0000    137    118    118
Point  6.789E-01  3.242E-01  1.422E+00  4.773E-04  2.279E-04  9.995E-04
Line   7.969E+00  4.989E+00  1.273E+01  2.122E-04  1.329E-04  3.390E-04
Strike Probability, 1/yr                6.896E-04  3.608E-04  1.339E-03
1.0E-5 1/yr design speed                     158.       148.       169.
1.0E-6 1/yr design speed                     193.       184.       204.
1.0E-7 1/yr design speed                     225.       215.       236.

   40   97    3.631E+03 1.0000    179    153    153
Point  1.450E+00  7.095E-01  2.963E+00  1.332E-03  6.518E-04  2.722E-03
Line   1.059E+01  6.818E+00  1.645E+01  3.685E-04  2.372E-04  5.723E-04
Strike Probability, 1/yr                1.700E-03  8.890E-04  3.294E-03
1.0E-5 1/yr design speed                     170.       160.       181.
1.0E-6 1/yr design speed                     204.       195.       215.
1.0E-7 1/yr design speed                     235.       225.       247.

   40   98    3.631E+03 1.0000    250    207    207
Point  4.551E-01  2.685E-01  7.714E-01  5.839E-04  3.444E-04  9.897E-04
Line   5.464E+00  3.978E+00  7.507E+00  2.656E-04  1.933E-04  3.648E-04
Strike Probability, 1/yr                8.494E-04  5.378E-04  1.355E-03
1.0E-5 1/yr design speed                     161.       154.       169.
1.0E-6 1/yr design speed                     196.       189.       204.
1.0E-7 1/yr design speed                     228.       220.       236.

   40   99    3.631E+03 1.0000    147    122    122
Point  1.811E-01  1.003E-01  3.271E-01  1.367E-04  7.567E-05  2.468E-04
Line   3.219E+00  2.191E+00  4.729E+00  9.198E-05  6.260E-05  1.351E-04
Strike Probability, 1/yr                2.286E-04  1.383E-04  3.820E-04
1.0E-5 1/yr design speed                     141.       132.       150.
1.0E-6 1/yr design speed                     179.       171.       187.
1.0E-7 1/yr design speed                     212.       204.       220.

   40  100    3.631E+03 1.0000     97     82     82
Point  5.996E-01  2.470E-01  1.456E+00  2.985E-04  1.230E-04  7.246E-04
Line   4.959E+00  3.024E+00  8.135E+00  9.352E-05  5.701E-05  1.534E-04
Strike Probability, 1/yr                3.920E-04  1.800E-04  8.780E-04
1.0E-5 1/yr design speed                     147.       134.       160.
1.0E-6 1/yr design speed                     184.       173.       196.
1.0E-7 1/yr design speed                     216.       205.       229.

   40  101    3.631E+03 1.0000     88     66     66
Point  3.456E-01  1.204E-01  9.924E-01  1.561E-04  5.436E-05  4.482E-04
Line   4.003E+00  2.166E+00  7.398E+00  6.848E-05  3.706E-05  1.266E-04
Strike Probability, 1/yr                2.246E-04  9.141E-05  5.748E-04
1.0E-5 1/yr design speed                     139.       124.       154.
1.0E-6 1/yr design speed                     177.       164.       191.
1.0E-7 1/yr design speed                     210.       198.       224.
```

```
   40  102    3.631E+03 1.0000    142    110    110
Point  4.302E-02  2.616E-02  7.075E-02  3.135E-05  1.906E-05  5.156E-05
Line   1.001E+00  7.285E-01  1.376E+00  2.764E-05  2.011E-05  3.799E-05
Strike Probability, 1/yr               5.899E-05  3.917E-05  8.955E-05
1.0E-5 1/yr design speed                    109.        98.       122.
1.0E-6 1/yr design speed                    152.       140.       164.
1.0E-7 1/yr design speed                    190.       178.       202.

   40  103    3.631E+03 1.0000    136    107    107
Point  4.837E-02  2.922E-02  8.008E-02  3.376E-05  2.039E-05  5.589E-05
Line   8.586E-01  6.296E-01  1.171E+00  2.270E-05  1.665E-05  3.096E-05
Strike Probability, 1/yr               5.646E-05  3.704E-05  8.685E-05
1.0E-5 1/yr design speed                    108.        96.       121.
1.0E-6 1/yr design speed                    151.       139.       163.
1.0E-7 1/yr design speed                    189.       177.       201.

   40  104    3.631E+03 1.0000    207    186    186
Point  4.478E-02  3.067E-02  6.540E-02  4.758E-05  3.258E-05  6.947E-05
Line   9.505E-01  7.592E-01  1.190E+00  3.825E-05  3.055E-05  4.788E-05
Strike Probability, 1/yr               8.582E-05  6.313E-05  1.174E-04
1.0E-5 1/yr design speed                    117.       107.       127.
1.0E-6 1/yr design speed                    158.       148.       169.
1.0E-7 1/yr design speed                    196.       185.       206.

   40  105    3.631E+03 1.0000     29     28     28
Point  3.127E-02  1.564E-02  6.253E-02  4.654E-06  2.328E-06  9.307E-06
Line   1.066E+00  6.167E-01  1.842E+00  6.009E-06  3.477E-06  1.039E-05
Strike Probability, 1/yr               1.066E-05  5.804E-06  1.969E-05
1.0E-5 1/yr design speed                     67.        60.        87.
1.0E-6 1/yr design speed                    122.       106.       138.
1.0E-7 1/yr design speed                    163.       148.       178.

   40  106    3.631E+03 1.0000      2      2      2
Point  7.075E-03  5.527E-03  9.056E-03  7.262E-08  5.674E-08  9.295E-08
Line   3.000E-01  0.000E+00  0.000E+00  1.166E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr               1.893E-07  5.674E-08  9.295E-08
1.0E-5 1/yr design speed                     60.        50.        50.
1.0E-6 1/yr design speed                     60.        50.        50.
1.0E-7 1/yr design speed                     84.        50.        50.

   40  107    3.631E+03 1.0000      4      3      3
Point  6.586E-03  2.222E-03  1.952E-02  1.352E-07  4.561E-08  4.008E-07
Line   3.899E-01  1.646E-01  9.235E-01  3.032E-07  1.280E-07  7.181E-07
Strike Probability, 1/yr               4.384E-07  1.736E-07  1.119E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        70.
1.0E-7 1/yr design speed                    104.        81.       128.

   40  108    3.631E+03 1.0000      1      1      1
Point  5.682E-03  0.000E+00  0.000E+00  2.916E-08  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  3.888E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr               6.804E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     50.        50.        50.
1.0E-6 1/yr design speed                     50.        50.        50.
1.0E-7 1/yr design speed                     50.        50.        50.
```

```
   40  109    3.631E+03 1.0000      7      6      6
Point  3.904E-02  4.134E-03  3.686E-01  1.402E-06  1.485E-07  1.324E-05
Line   1.399E+00  3.776E-01  5.181E+00  1.903E-06  5.138E-07  7.050E-06
Strike Probability, 1/yr                3.306E-06  6.623E-07  2.029E-05
1.0E-5 1/yr design speed                      60.        60.        87.
1.0E-6 1/yr design speed                      98.        60.       137.
1.0E-7 1/yr design speed                     143.       110.       178.

   40  110    3.631E+03 1.0000      2      1      1
Point  7.955E-04  0.000E+00  0.000E+00  8.165E-09  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  7.776E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                8.593E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   40  111    3.631E+03 1.0000     17     13     13
Point  1.193E-01  1.232E-02  1.155E+00  1.041E-05  1.075E-06  1.008E-04
Line   1.183E+00  4.512E-01  3.102E+00  3.910E-06  1.491E-06  1.025E-05
Strike Probability, 1/yr                1.432E-05  2.566E-06  1.110E-04
1.0E-5 1/yr design speed                      76.        60.       124.
1.0E-6 1/yr design speed                     125.        89.       166.
1.0E-7 1/yr design speed                     166.       133.       203.

   40  112    3.631E+03 1.0000     10      9      9
Point  4.938E-02  4.300E-03  5.671E-01  2.534E-06  2.207E-07  2.911E-05
Line   7.375E-01  2.332E-01  2.333E+00  1.434E-06  4.533E-07  4.535E-06
Strike Probability, 1/yr                3.968E-06  6.740E-07  3.364E-05
1.0E-5 1/yr design speed                      60.        60.        99.
1.0E-6 1/yr design speed                     101.        60.       145.
1.0E-7 1/yr design speed                     144.       109.       185.

   40  113    3.631E+03 1.0000      2      0      0

   40  114    3.631E+03 1.0000      2      2      2
Point  1.017E+01  3.321E-05  3.115E+06  1.044E-04  3.408E-10  3.197E+01
Line   4.342E+00  9.706E-02  1.942E+02  1.688E-06  3.774E-08  7.551E-05
Strike Probability, 1/yr                1.061E-04  3.808E-08  3.197E+01
1.0E-5 1/yr design speed                     118.        50.       319.
1.0E-6 1/yr design speed                     159.        50.       350.
1.0E-7 1/yr design speed                     196.        50.       380.

   40  115    3.631E+03 1.0000      5      5      5
Point  8.016E-02  1.228E-03  5.233E+00  2.057E-06  3.151E-08  1.343E-04
Line   1.131E+00  1.685E-01  7.588E+00  1.099E-06  1.638E-07  7.375E-06
Strike Probability, 1/yr                3.156E-06  1.953E-07  1.417E-04
1.0E-5 1/yr design speed                      60.        60.       128.
1.0E-6 1/yr design speed                      95.        60.       170.
1.0E-7 1/yr design speed                     140.        84.       207.

   40  116    3.631E+03 1.0000      3      3      3
Point  1.324E-02  1.390E-03  1.261E-01  2.038E-07  2.139E-08  1.942E-06
Line   5.866E-01  1.778E-01  1.935E+00  3.421E-07  1.037E-07  1.129E-06
Strike Probability, 1/yr                5.459E-07  1.251E-07  3.071E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        98.
1.0E-7 1/yr design speed                     109.        73.       145.
```

```
   40  117    3.631E+03 1.0000      1      0      0

   40  118    3.631E+03 1.0000      0      0      0

   40  119    3.631E+03 1.0000      1      1      1
Point  2.300E-01  0.000E+00  0.000E+00  1.181E-06  0.000E+00  0.000E+00
Line   1.227E+01  0.000E+00  0.000E+00  2.385E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                3.566E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                     100.        50.        50.
1.0E-7 1/yr design speed                     145.        50.        50.

   40  120    3.631E+03 1.0000      0      0      0

   40  121    3.631E+03 1.0000      0      0      0

   40  122    3.631E+03 1.0000      4      1      1
Point  1.705E-04  0.000E+00  0.000E+00  3.499E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  7.776E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                8.126E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   40  123    3.631E+03 1.0000      0      0      0

   40  124    7.261E+02 0.2000      1      1      1
Point  2.273E-01  0.000E+00  0.000E+00  5.832E-06  0.000E+00  0.000E+00
Line   2.000E+00  0.000E+00  0.000E+00  1.944E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                7.776E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                     113.        50.        50.
1.0E-7 1/yr design speed                     155.        50.        50.

   41   69    1.788E+02 0.0500      0      0      0
Point  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
Line   0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
Strike Probability, 1/yr                0.000E+00  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                       0.         0.         0.
1.0E-6 1/yr design speed                       0.         0.         0.
1.0E-7 1/yr design speed                       0.         0.         0.

   41   70    3.576E+02 0.1000      9      8      8
Point  2.241E-02  3.159E-03  1.590E-01  1.051E-05  1.482E-06  7.454E-05
Line   7.567E-01  2.304E-01  2.486E+00  1.344E-05  4.093E-06  4.415E-05
Strike Probability, 1/yr                2.395E-05  5.574E-06  1.187E-04
1.0E-5 1/yr design speed                      93.        60.       126.
1.0E-6 1/yr design speed                     139.       113.       165.
1.0E-7 1/yr design speed                     176.       153.       200.
```

```
   41   71    1.430E+03 0.4000     14     14     14
Point  4.364E-01  6.988E-02  2.725E+00  7.958E-05  1.274E-05  4.970E-04
Line   1.985E+00  9.022E-01  4.367E+00  1.371E-05  6.233E-06  3.017E-05
Strike Probability, 1/yr               9.330E-05  1.898E-05  5.272E-04
1.0E-5 1/yr design speed                   116.        83.       148.
1.0E-6 1/yr design speed                   157.       131.       186.
1.0E-7 1/yr design speed                   194.       169.       223.

   41   72    2.861E+03 0.8000     41     33     33
Point  4.837E-01  1.244E-01  1.880E+00  1.292E-04  3.323E-05  5.021E-04
Line   3.286E+00  1.614E+00  6.689E+00  3.324E-05  1.633E-05  6.766E-05
Strike Probability, 1/yr               1.624E-04  4.956E-05  5.697E-04
1.0E-5 1/yr design speed                   128.       105.       150.
1.0E-6 1/yr design speed                   167.       147.       188.
1.0E-7 1/yr design speed                   203.       183.       224.

   41   73    3.218E+03 0.9000     56     51     51
Point  1.483E-01  7.150E-02  3.075E-01  4.807E-05  2.318E-05  9.970E-05
Line   2.657E+00  1.631E+00  4.326E+00  3.263E-05  2.004E-05  5.313E-05
Strike Probability, 1/yr               8.070E-05  4.322E-05  1.528E-04
1.0E-5 1/yr design speed                   117.       104.       130.
1.0E-6 1/yr design speed                   158.       147.       169.
1.0E-7 1/yr design speed                   193.       182.       204.

   41   74    3.576E+03 1.0000     33     30     30
Point  4.576E-01  1.768E-01  1.184E+00  7.869E-05  3.040E-05  2.037E-04
Line   3.492E+00  1.964E+00  6.208E+00  2.275E-05  1.280E-05  4.044E-05
Strike Probability, 1/yr               1.014E-04  4.320E-05  2.441E-04
1.0E-5 1/yr design speed                   119.       102.       136.
1.0E-6 1/yr design speed                   159.       144.       175.
1.0E-7 1/yr design speed                   195.       181.       211.

   41   75    3.576E+03 1.0000     35     33     33
Point  5.759E-01  1.677E-01  1.978E+00  1.050E-04  3.059E-05  3.607E-04
Line   2.595E+00  1.481E+00  4.547E+00  1.792E-05  1.023E-05  3.141E-05
Strike Probability, 1/yr               1.230E-04  4.081E-05  3.921E-04
1.0E-5 1/yr design speed                   122.       100.       143.
1.0E-6 1/yr design speed                   162.       143.       182.
1.0E-7 1/yr design speed                   198.       180.       218.

   41   76    3.576E+03 1.0000     59     55     55
Point  1.001E+00  3.999E-01  2.504E+00  3.076E-04  1.229E-04  7.698E-04
Line   4.187E+00  2.762E+00  6.347E+00  4.876E-05  3.216E-05  7.392E-05
Strike Probability, 1/yr               3.564E-04  1.551E-04  8.437E-04
1.0E-5 1/yr design speed                   141.       126.       157.
1.0E-6 1/yr design speed                   179.       164.       194.
1.0E-7 1/yr design speed                   214.       200.       230.

   41   77    3.576E+03 1.0000     23     23     23
Point  3.747E+00  7.381E-01  1.902E+01  4.490E-04  8.846E-05  2.279E-03
Line   5.367E+00  2.940E+00  9.795E+00  2.436E-05  1.335E-05  4.447E-05
Strike Probability, 1/yr               4.734E-04  1.018E-04  2.324E-03
1.0E-5 1/yr design speed                   144.       116.       173.
1.0E-6 1/yr design speed                   183.       156.       210.
1.0E-7 1/yr design speed                   219.       193.       246.
```

```
   41   78    3.576E+03 1.0000     32     29     29
Point  6.796E+00  1.333E+00  3.465E+01  1.133E-03  2.223E-04  5.777E-03
Line   6.989E+00  3.700E+00  1.320E+01  4.414E-05  2.337E-05  8.337E-05
Strike Probability, 1/yr               1.177E-03  2.456E-04  5.861E-03
1.0E-5 1/yr design speed                    160.       135.       186.
1.0E-6 1/yr design speed                    195.       172.       220.
1.0E-7 1/yr design speed                    227.       204.       253.

   41   79    3.576E+03 1.0000     47     40     40
Point  2.206E+00  7.253E-01  6.710E+00  5.403E-04  1.776E-04  1.643E-03
Line   6.087E+00  3.825E+00  9.688E+00  5.647E-05  3.548E-05  8.987E-05
Strike Probability, 1/yr               5.967E-04  2.131E-04  1.733E-03
1.0E-5 1/yr design speed                    151.       134.       168.
1.0E-6 1/yr design speed                    186.       171.       203.
1.0E-7 1/yr design speed                    219.       204.       236.

   41   80    3.218E+03 0.9000     89     74     74
Point  1.754E+00  7.118E-01  4.323E+00  9.039E-04  3.668E-04  2.228E-03
Line   6.998E+00  4.591E+00  1.067E+01  1.366E-04  8.960E-05  2.082E-04
Strike Probability, 1/yr               1.040E-03  4.564E-04  2.436E-03
1.0E-5 1/yr design speed                    160.       148.       174.
1.0E-6 1/yr design speed                    195.       183.       209.
1.0E-7 1/yr design speed                    227.       215.       242.

   41   81    2.146E+03 0.6000     60     51     51
Point  3.885E-01  1.858E-01  8.123E-01  2.024E-04  9.681E-05  4.233E-04
Line   3.466E+00  2.262E+00  5.311E+00  6.841E-05  4.464E-05  1.048E-04
Strike Probability, 1/yr               2.708E-04  1.415E-04  5.281E-04
1.0E-5 1/yr design speed                    141.       130.       152.
1.0E-6 1/yr design speed                    178.       169.       189.
1.0E-7 1/yr design speed                    211.       202.       222.

   41   82    1.430E+03 0.4000     75     65     65
Point  7.831E-01  3.074E-01  1.995E+00  7.651E-04  3.003E-04  1.949E-03
Line   5.865E+00  3.400E+00  1.012E+01  2.171E-04  1.258E-04  3.745E-04
Strike Probability, 1/yr               9.821E-04  4.261E-04  2.324E-03
1.0E-5 1/yr design speed                    162.       149.       175.
1.0E-6 1/yr design speed                    197.       185.       210.
1.0E-7 1/yr design speed                    228.       216.       242.

   41   83    3.218E+03 0.9000     90     79     79
Point  7.236E-01  3.048E-01  1.718E+00  3.770E-04  1.588E-04  8.950E-04
Line   5.643E+00  3.424E+00  9.300E+00  1.114E-04  6.758E-05  1.836E-04
Strike Probability, 1/yr               4.884E-04  2.264E-04  1.079E-03
1.0E-5 1/yr design speed                    151.       138.       163.
1.0E-6 1/yr design speed                    187.       176.       199.
1.0E-7 1/yr design speed                    219.       208.       232.

   41   84    3.576E+03 1.0000     97     77     77
Point  1.956E+00  7.749E-01  4.939E+00  9.888E-04  3.917E-04  2.496E-03
Line   6.973E+00  4.579E+00  1.062E+01  1.335E-04  8.767E-05  2.033E-04
Strike Probability, 1/yr               1.122E-03  4.793E-04  2.699E-03
1.0E-5 1/yr design speed                    161.       148.       175.
1.0E-6 1/yr design speed                    196.       184.       210.
1.0E-7 1/yr design speed                    228.       215.       243.
```

```
   41   85    3.576E+03 1.0000    134    101    101
Point  2.646E+00  9.825E-01  7.125E+00  1.847E-03  6.860E-04  4.975E-03
Line   7.392E+00  4.729E+00  1.155E+01  1.955E-04  1.251E-04  3.056E-04
Strike Probability, 1/yr               2.043E-03  8.111E-04  5.281E-03
1.0E-5 1/yr design speed                    170.       156.       185.
1.0E-6 1/yr design speed                    204.       190.       220.
1.0E-7 1/yr design speed                    236.       222.       252.

   41   86    3.218E+03 0.9000    139     95     95
Point  2.633E+00  9.680E-01  7.161E+00  2.119E-03  7.790E-04  5.763E-03
Line   6.067E+00  3.939E+00  9.345E+00  1.849E-04  1.201E-04  2.849E-04
Strike Probability, 1/yr               2.304E-03  8.991E-04  6.048E-03
1.0E-5 1/yr design speed                    172.       157.       187.
1.0E-6 1/yr design speed                    205.       191.       221.
1.0E-7 1/yr design speed                    237.       223.       254.

   41   87    2.861E+03 0.8000    113     81     81
Point  8.661E-01  4.239E-01  1.770E+00  6.375E-04  3.120E-04  1.302E-03
Line   6.664E+00  4.517E+00  9.832E+00  1.858E-04  1.259E-04  2.741E-04
Strike Probability, 1/yr               8.233E-04  4.379E-04  1.577E-03
1.0E-5 1/yr design speed                    159.       150.       169.
1.0E-6 1/yr design speed                    194.       185.       205.
1.0E-7 1/yr design speed                    226.       216.       237.

   41   88    3.576E+03 1.0000    134    114    114
Point  4.329E-01  2.495E-01  7.510E-01  3.022E-04  1.742E-04  5.244E-04
Line   4.804E+00  3.465E+00  6.661E+00  1.271E-04  9.164E-05  1.762E-04
Strike Probability, 1/yr               4.293E-04  2.658E-04  7.006E-04
1.0E-5 1/yr design speed                    150.       142.       158.
1.0E-6 1/yr design speed                    186.       179.       194.
1.0E-7 1/yr design speed                    218.       211.       227.

   41   89    3.576E+03 1.0000     94     77     77
Point  1.165E+00  3.590E-01  3.779E+00  5.705E-04  1.758E-04  1.851E-03
Line   7.313E+00  3.928E+00  1.362E+01  1.357E-04  7.288E-05  2.526E-04
Strike Probability, 1/yr               7.062E-04  2.487E-04  2.104E-03
1.0E-5 1/yr design speed                    156.       140.       173.
1.0E-6 1/yr design speed                    191.       177.       208.
1.0E-7 1/yr design speed                    223.       209.       240.

   41   90    3.576E+03 1.0000    166    138    138
Point  8.888E-01  4.106E-01  1.924E+00  7.688E-04  3.551E-04  1.664E-03
Line   5.318E+00  3.582E+00  7.895E+00  1.742E-04  1.174E-04  2.587E-04
Strike Probability, 1/yr               9.430E-04  4.725E-04  1.923E-03
1.0E-5 1/yr design speed                    160.       150.       172.
1.0E-6 1/yr design speed                    195.       185.       207.
1.0E-7 1/yr design speed                    227.       217.       239.

   41   91    3.576E+03 1.0000    140    117    119
Point  2.004E+00  8.558E-01  4.695E+00  1.462E-03  6.243E-04  3.425E-03
Line   9.465E+00  6.132E+00  1.461E+01  2.615E-04  1.695E-04  4.037E-04
Strike Probability, 1/yr               1.724E-03  7.937E-04  3.829E-03
1.0E-5 1/yr design speed                    169.       157.       182.
1.0E-6 1/yr design speed                    203.       192.       216.
1.0E-7 1/yr design speed                    234.       223.       248.
```

```
   41   92    3.576E+03 1.0000    116     98     98
Point  1.020E+00  4.189E-01  2.482E+00  6.163E-04  2.532E-04  1.500E-03
Line   6.247E+00  3.919E+00  9.957E+00  1.430E-04  8.973E-05  2.280E-04
Strike Probability, 1/yr                7.593E-04  3.429E-04  1.728E-03
1.0E-5 1/yr design speed                     157.       145.       170.
1.0E-6 1/yr design speed                     192.       181.       205.
1.0E-7 1/yr design speed                     224.       213.       238.

   41   93    3.576E+03 1.0000    163    143    143
Point  1.539E+00  6.822E-01  3.472E+00  1.307E-03  5.794E-04  2.949E-03
Line   7.468E+00  4.906E+00  1.137E+01  2.402E-04  1.578E-04  3.657E-04
Strike Probability, 1/yr                1.547E-03  7.373E-04  3.315E-03
1.0E-5 1/yr design speed                     167.       156.       180.
1.0E-6 1/yr design speed                     202.       191.       214.
1.0E-7 1/yr design speed                     233.       222.       246.

   41   94    3.576E+03 1.0000    112     97     97
Point  1.714E+00  6.450E-01  4.555E+00  1.000E-03  3.764E-04  2.658E-03
Line   5.200E+00  3.375E+00  8.012E+00  1.149E-04  7.460E-05  1.771E-04
Strike Probability, 1/yr                1.115E-03  4.510E-04  2.835E-03
1.0E-5 1/yr design speed                     161.       147.       176.
1.0E-6 1/yr design speed                     196.       182.       211.
1.0E-7 1/yr design speed                     228.       214.       244.

   41   95    3.576E+03 1.0000    109     93     93
Point  6.071E-01  2.830E-01  1.303E+00  3.448E-04  1.607E-04  7.398E-04
Line   5.734E+00  3.711E+00  8.860E+00  1.234E-04  7.983E-05  1.906E-04
Strike Probability, 1/yr                4.682E-04  2.406E-04  9.304E-04
1.0E-5 1/yr design speed                     151.       140.       162.
1.0E-6 1/yr design speed                     187.       177.       198.
1.0E-7 1/yr design speed                     219.       209.       230.

   41   96    3.576E+03 1.0000    128    107    107
Point  7.172E-01  3.172E-01  1.622E+00  4.784E-04  2.116E-04  1.082E-03
Line   4.755E+00  3.058E+00  7.393E+00  1.201E-04  7.726E-05  1.868E-04
Strike Probability, 1/yr                5.985E-04  2.888E-04  1.268E-03
1.0E-5 1/yr design speed                     153.       142.       165.
1.0E-6 1/yr design speed                     189.       178.       201.
1.0E-7 1/yr design speed                     221.       210.       234.

   41   97    3.576E+03 1.0000    179    143    143
Point  1.141E+00  5.494E-01  2.370E+00  1.064E-03  5.124E-04  2.210E-03
Line   5.468E+00  3.787E+00  7.894E+00  1.932E-04  1.338E-04  2.789E-04
Strike Probability, 1/yr                1.257E-03  6.462E-04  2.489E-03
1.0E-5 1/yr design speed                     164.       154.       175.
1.0E-6 1/yr design speed                     199.       189.       210.
1.0E-7 1/yr design speed                     230.       220.       242.

   41   98    3.576E+03 1.0000    152    127    127
Point  5.175E-01  2.649E-01  1.011E+00  4.099E-04  2.098E-04  8.008E-04
Line   7.650E+00  4.942E+00  1.184E+01  2.295E-04  1.483E-04  3.552E-04
Strike Probability, 1/yr                6.394E-04  3.581E-04  1.156E-03
1.0E-5 1/yr design speed                     158.       149.       167.
1.0E-6 1/yr design speed                     193.       184.       203.
1.0E-7 1/yr design speed                     225.       216.       234.
```

```
   41   99    3.576E+03 1.0000    112     90     90
Point  2.313E+00  8.033E-01  6.660E+00  1.350E-03  4.688E-04  3.887E-03
Line   1.064E+01  6.129E+00  1.846E+01  2.352E-04  1.355E-04  4.082E-04
Strike Probability, 1/yr               1.585E-03  6.043E-04  4.295E-03
1.0E-5 1/yr design speed                    168.       153.       183.
1.0E-6 1/yr design speed                    202.       188.       217.
1.0E-7 1/yr design speed                    233.       219.       250.

   41  100    3.576E+03 1.0000     72     57     57
Point  9.083E-01  2.614E-01  3.156E+00  3.408E-04  9.806E-05  1.184E-03
Line   8.681E+00  4.022E+00  1.874E+01  1.234E-04  5.715E-05  2.663E-04
Strike Probability, 1/yr               4.641E-04  1.552E-04  1.450E-03
1.0E-5 1/yr design speed                    151.       133.       168.
1.0E-6 1/yr design speed                    187.       171.       204.
1.0E-7 1/yr design speed                    219.       204.       236.

   41  101    3.576E+03 1.0000     67     58     58
Point  7.600E-02  3.180E-02  1.816E-01  2.653E-05  1.110E-05  6.341E-05
Line   1.177E+00  7.399E-01  1.874E+00  1.557E-05  9.785E-06  2.478E-05
Strike Probability, 1/yr               4.210E-05  2.089E-05  8.819E-05
1.0E-5 1/yr design speed                    107.        90.       121.
1.0E-6 1/yr design speed                    151.       140.       162.
1.0E-7 1/yr design speed                    187.       178.       198.

   41  102    3.576E+03 1.0000     74     51     51
Point  1.833E-01  6.564E-02  5.120E-01  7.069E-05  2.531E-05  1.974E-04
Line   3.943E+00  1.962E+00  7.925E+00  5.759E-05  2.865E-05  1.158E-04
Strike Probability, 1/yr               1.283E-04  5.396E-05  3.132E-04
1.0E-5 1/yr design speed                    125.       104.       145.
1.0E-6 1/yr design speed                    165.       146.       185.
1.0E-7 1/yr design speed                    202.       183.       221.

   41  103    3.576E+03 1.0000    155    115    115
Point  2.073E-01  9.462E-02  4.540E-01  1.674E-04  7.642E-05  3.666E-04
Line   3.104E+00  1.922E+00  5.014E+00  9.497E-05  5.880E-05  1.534E-04
Strike Probability, 1/yr               2.624E-04  1.352E-04  5.200E-04
1.0E-5 1/yr design speed                    137.       121.       154.
1.0E-6 1/yr design speed                    177.       160.       193.
1.0E-7 1/yr design speed                    213.       197.       228.

   41  104    3.576E+03 1.0000    123     98     98
Point  5.754E-02  3.142E-02  1.054E-01  3.688E-05  2.014E-05  6.754E-05
Line   1.556E+00  1.074E+00  2.255E+00  3.778E-05  2.607E-05  5.476E-05
Strike Probability, 1/yr               7.466E-05  4.621E-05  1.223E-04
1.0E-5 1/yr design speed                    114.       101.       128.
1.0E-6 1/yr design speed                    157.       143.       170.
1.0E-7 1/yr design speed                    194.       181.       207.

   41  105    3.576E+03 1.0000     30     21     21
Point  4.226E-02  1.038E-02  1.720E-01  6.606E-06  1.622E-06  2.689E-05
Line   8.137E-01  4.080E-01  1.623E+00  4.818E-06  2.416E-06  9.609E-06
Strike Probability, 1/yr               1.142E-05  4.038E-06  3.650E-05
1.0E-5 1/yr design speed                     70.        60.       102.
1.0E-6 1/yr design speed                    122.        99.       148.
1.0E-7 1/yr design speed                    163.       141.       187.
```

```
   41  106    3.576E+03 1.0000      9      7      7
Point  1.462E+01  3.388E-02  6.306E+03  6.855E-04  1.589E-06  2.957E-01
Line   2.669E+00  6.484E-01  1.099E+01  4.742E-06  1.152E-06  1.952E-05
Strike Probability, 1/yr                6.903E-04  2.741E-06  2.958E-01
1.0E-5 1/yr design speed                     151.        60.       253.
1.0E-6 1/yr design speed                     189.        89.       286.
1.0E-7 1/yr design speed                     225.       133.       318.

   41  107    3.576E+03 1.0000      7      4      4
Point  8.762E-02  3.683E-04  2.085E+01  3.196E-06  1.343E-08  7.603E-04
Line   6.135E-01  1.673E-01  2.250E+00  8.476E-07  2.311E-07  3.109E-06
Strike Probability, 1/yr                4.043E-06  2.445E-07  7.634E-04
1.0E-5 1/yr design speed                      60.        60.       159.
1.0E-6 1/yr design speed                     100.        60.       197.
1.0E-7 1/yr design speed                     144.        90.       233.

   41  108    3.576E+03 1.0000      3      2      2
Point  1.420E-02  0.000E+00  0.000E+00  2.220E-07  0.000E+00  0.000E+00
Line   5.000E-01  0.000E+00  0.000E+00  2.961E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                5.181E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     107.        50.        50.

   41  109    3.576E+03 1.0000      8      7      7
Point  1.695E-02  3.750E-03  7.662E-02  7.066E-07  1.563E-07  3.194E-06
Line   3.585E-01  1.851E-01  6.945E-01  5.661E-07  2.922E-07  1.097E-06
Strike Probability, 1/yr                1.273E-06  4.485E-07  4.291E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      73.        60.       105.
1.0E-7 1/yr design speed                     124.       101.       150.

   41  110    3.576E+03 1.0000      5      4      4
Point  8.160E-02  2.159E-02  3.083E-01  2.126E-06  5.626E-07  8.033E-06
Line   2.027E+00  7.248E-01  5.671E+00  2.001E-06  7.153E-07  5.597E-06
Strike Probability, 1/yr                4.127E-06  1.278E-06  1.363E-05
1.0E-5 1/yr design speed                      60.        60.        77.
1.0E-6 1/yr design speed                     102.        72.       130.
1.0E-7 1/yr design speed                     146.       121.       171.

   41  111    3.576E+03 1.0000     10      9      9
Point  1.188E-02  3.357E-03  4.205E-02  6.190E-07  1.749E-07  2.191E-06
Line   3.648E-01  2.180E-01  6.103E-01  7.200E-07  4.303E-07  1.205E-06
Strike Probability, 1/yr                1.339E-06  6.052E-07  3.396E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      75.        60.       101.
1.0E-7 1/yr design speed                     126.       108.       147.

   41  112    3.576E+03 1.0000     13     11     11
Point  2.239E-02  5.490E-03  9.134E-02  1.517E-06  3.719E-07  6.187E-06
Line   1.023E+00  4.244E-01  2.464E+00  2.624E-06  1.089E-06  6.321E-06
Strike Probability, 1/yr                4.141E-06  1.461E-06  1.251E-05
1.0E-5 1/yr design speed                      60.        60.        75.
1.0E-6 1/yr design speed                     103.        77.       129.
1.0E-7 1/yr design speed                     147.       125.       171.

   41  113    3.576E+03 1.0000      2      0      0
```

```
   41  114    3.576E+03 1.0000      1      1      1
Point  8.523E-03  0.000E+00  0.000E+00  4.441E-08  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  1.974E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.418E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      91.        50.        50.

   41  115    3.576E+03 1.0000      3      1      1
Point  2.273E-01  0.000E+00  0.000E+00  3.553E-06  0.000E+00  0.000E+00
Line   8.000E+00  0.000E+00  0.000E+00  4.737E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                8.290E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                     117.        50.        50.
1.0E-7 1/yr design speed                     159.        50.        50.

   41  116    3.576E+03 1.0000      0      0      0

   41  117    3.576E+03 1.0000      1      1      1
Point  5.682E-04  0.000E+00  0.000E+00  2.961E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  1.974E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.270E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   41  118    3.576E+03 1.0000      0      0      0

   41  119    3.576E+03 1.0000      2      2      2
Point  1.136E-03  0.000E+00  0.000E+00  1.184E-08  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  7.895E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                9.079E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   41  120    3.576E+03 1.0000      0      0      0

   41  121    3.576E+03 1.0000      1      1      1
Point  7.670E-02  0.000E+00  0.000E+00  3.997E-07  0.000E+00  0.000E+00
Line   2.700E+00  0.000E+00  0.000E+00  5.329E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                9.326E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     119.        50.        50.

   41  122    3.576E+03 1.0000      0      0      0

   41  123    3.576E+03 1.0000      0      0      0

   41  124    3.576E+02 0.1000      6      5      5
Point  7.145E-03  2.559E-03  1.995E-02  2.234E-06  8.002E-07  6.237E-06
Line   3.144E-01  1.778E-01  5.559E-01  3.723E-06  2.105E-06  6.583E-06
Strike Probability, 1/yr                5.957E-06  2.906E-06  1.282E-05
1.0E-5 1/yr design speed                      60.        60.        76.
1.0E-6 1/yr design speed                     110.        92.       129.
1.0E-7 1/yr design speed                     154.       137.       171.
```

```
   42   70    7.040E+02 0.2000     11     10     10
Point  1.417E-01  3.628E-02  5.536E-01  4.126E-05  1.056E-05  1.612E-04
Line   2.003E+00  8.007E-01  5.013E+00  2.209E-05  8.829E-06  5.528E-05
Strike Probability, 1/yr               6.335E-05  1.939E-05  2.165E-04
1.0E-5 1/yr design speed                    112.        85.       135.
1.0E-6 1/yr design speed                    153.       133.       174.
1.0E-7 1/yr design speed                    189.       170.       209.

   42   71    3.520E+03 1.0000     81     76     76
Point  3.255E-01  1.430E-01  7.408E-01  1.395E-04  6.131E-05  3.176E-04
Line   3.261E+00  2.053E+00  5.179E+00  5.295E-05  3.333E-05  8.412E-05
Strike Probability, 1/yr               1.925E-04  9.464E-05  4.017E-04
1.0E-5 1/yr design speed                    132.       118.       146.
1.0E-6 1/yr design speed                    170.       158.       183.
1.0E-7 1/yr design speed                    205.       193.       218.

   42   72    3.520E+03 1.0000     76     69     69
Point  2.230E-01  1.040E-01  4.785E-01  8.972E-05  4.182E-05  1.925E-04
Line   2.900E+00  1.913E+00  4.396E+00  4.418E-05  2.915E-05  6.698E-05
Strike Probability, 1/yr               1.339E-04  7.097E-05  2.595E-04
1.0E-5 1/yr design speed                    126.       113.       138.
1.0E-6 1/yr design speed                    165.       154.       177.
1.0E-7 1/yr design speed                    200.       189.       211.

   42   73    3.520E+03 1.0000     59     55     55
Point  7.627E-01  3.250E-01  1.790E+00  2.382E-04  1.015E-04  5.589E-04
Line   4.261E+00  2.733E+00  6.643E+00  5.040E-05  3.232E-05  7.858E-05
Strike Probability, 1/yr               2.886E-04  1.338E-04  6.375E-04
1.0E-5 1/yr design speed                    138.       123.       152.
1.0E-6 1/yr design speed                    176.       162.       190.
1.0E-7 1/yr design speed                    211.       197.       225.

   42   74    3.520E+03 1.0000     26     24     24
Point  5.403E+00  4.785E-01  6.101E+01  7.436E-04  6.585E-05  8.396E-03
Line   3.652E+00  1.888E+00  7.065E+00  1.904E-05  9.840E-06  3.683E-05
Strike Probability, 1/yr               7.626E-04  7.569E-05  8.433E-03
1.0E-5 1/yr design speed                    152.       111.       194.
1.0E-6 1/yr design speed                    190.       152.       230.
1.0E-7 1/yr design speed                    227.       188.       265.

   42   75    3.520E+03 1.0000     30     28     28
Point  4.578E-01  1.397E-01  1.500E+00  7.269E-05  2.218E-05  2.382E-04
Line   2.435E+00  1.305E+00  4.544E+00  1.465E-05  7.850E-06  2.733E-05
Strike Probability, 1/yr               8.734E-05  3.003E-05  2.656E-04
1.0E-5 1/yr design speed                    115.        94.       137.
1.0E-6 1/yr design speed                    156.       138.       176.
1.0E-7 1/yr design speed                    193.       175.       212.

   42   76    3.520E+03 1.0000     22     21     21
Point  2.503E+00  5.373E-01  1.166E+01  2.914E-04  6.257E-05  1.357E-03
Line   4.448E+00  2.555E+00  7.744E+00  1.962E-05  1.127E-05  3.416E-05
Strike Probability, 1/yr               3.111E-04  7.384E-05  1.392E-03
1.0E-5 1/yr design speed                    137.       110.       164.
1.0E-6 1/yr design speed                    176.       152.       202.
1.0E-7 1/yr design speed                    212.       188.       238.
```

```
   42   77    3.520E+03 1.0000     13     12     12
Point  1.450E-01  3.455E-02  6.082E-01  9.975E-06  2.378E-06  4.185E-05
Line   1.320E+00  8.238E-01  2.116E+00  3.441E-06  2.147E-06  5.516E-06
Strike Probability, 1/yr               1.342E-05  4.525E-06  4.737E-05
1.0E-5 1/yr design speed                     75.        60.       104.
1.0E-6 1/yr design speed                    125.       105.       147.
1.0E-7 1/yr design speed                    164.       147.       185.

   42   78    3.520E+03 1.0000     28     27     27
Point  9.737E-01  2.226E-01  4.259E+00  1.443E-04  3.299E-05  6.313E-04
Line   6.546E+00  2.965E+00  1.445E+01  3.675E-05  1.665E-05  8.113E-05
Strike Probability, 1/yr               1.811E-04  4.963E-05  7.124E-04
1.0E-5 1/yr design speed                    132.       109.       155.
1.0E-6 1/yr design speed                    171.       153.       191.
1.0E-7 1/yr design speed                    205.       188.       225.

   42   79    1.056E+03 0.3000     22     19     19
Point  2.952E+00  2.545E-01  3.424E+01  1.146E-03  9.878E-05  1.329E-02
Line   6.862E+00  2.504E+00  1.880E+01  1.009E-04  3.682E-05  2.765E-04
Strike Probability, 1/yr               1.247E-03  1.356E-04  1.357E-02
1.0E-5 1/yr design speed                    162.       128.       199.
1.0E-6 1/yr design speed                    197.       167.       232.
1.0E-7 1/yr design speed                    229.       201.       265.

   42   80    1.760E+02 0.0500      6      4      4
Point  5.741E-02  6.458E-03  5.104E-01  3.647E-05  4.102E-06  3.242E-04
Line   1.502E+00  3.696E-01  6.104E+00  3.614E-05  8.894E-06  1.469E-04
Strike Probability, 1/yr               7.261E-05  1.300E-05  4.711E-04
1.0E-5 1/yr design speed                    121.        78.       153.
1.0E-6 1/yr design speed                    162.       135.       189.
1.0E-7 1/yr design speed                    197.       174.       222.

   42   82    1.056E+03 0.3000     23     21     21
Point  1.223E+00  2.090E-01  7.156E+00  4.963E-04  8.483E-05  2.904E-03
Line   4.782E+00  2.300E+00  9.943E+00  7.351E-05  3.535E-05  1.528E-04
Strike Probability, 1/yr               5.698E-04  1.202E-04  3.057E-03
1.0E-5 1/yr design speed                    151.       127.       177.
1.0E-6 1/yr design speed                    186.       166.       211.
1.0E-7 1/yr design speed                    219.       199.       244.

   42   83    3.520E+03 1.0000    127    109    109
Point  4.703E-01  2.430E-01  9.099E-01  3.161E-04  1.634E-04  6.117E-04
Line   4.592E+00  3.125E+00  6.748E+00  1.169E-04  7.958E-05  1.718E-04
Strike Probability, 1/yr               4.331E-04  2.430E-04  7.835E-04
1.0E-5 1/yr design speed                    150.       140.       159.
1.0E-6 1/yr design speed                    186.       177.       195.
1.0E-7 1/yr design speed                    218.       209.       228.

   42   84    3.520E+03 1.0000    116    102    102
Point  1.040E+00  4.497E-01  2.404E+00  6.384E-04  2.761E-04  1.476E-03
Line   5.736E+00  3.849E+00  8.548E+00  1.334E-04  8.951E-05  1.988E-04
Strike Probability, 1/yr               7.718E-04  3.656E-04  1.675E-03
1.0E-5 1/yr design speed                    157.       145.       169.
1.0E-6 1/yr design speed                    192.       181.       204.
1.0E-7 1/yr design speed                    224.       213.       237.
```

```
   42   85    3.520E+03 1.0000    104     90     90
Point  1.956E+00  8.004E-01  4.780E+00  1.077E-03  4.406E-04  2.631E-03
Line   6.442E+00  4.278E+00  9.700E+00  1.343E-04  8.920E-05  2.023E-04
Strike Probability, 1/yr                1.211E-03  5.298E-04  2.833E-03
1.0E-5 1/yr design speed                     162.       150.       176.
1.0E-6 1/yr design speed                     197.       185.       211.
1.0E-7 1/yr design speed                     229.       216.       244.

   42   86    1.056E+03 0.3000     36     34     34
Point  9.354E-01  2.957E-01  2.959E+00  5.941E-04  1.878E-04  1.879E-03
Line   7.270E+00  4.029E+00  1.312E+01  1.749E-04  9.693E-05  3.156E-04
Strike Probability, 1/yr                7.690E-04  2.848E-04  2.195E-03
1.0E-5 1/yr design speed                     158.       143.       174.
1.0E-6 1/yr design speed                     193.       180.       209.
1.0E-7 1/yr design speed                     225.       212.       241.

   42   87    7.040E+02 0.2000     38     34     34
Point  3.446E-01  1.366E-01  8.692E-01  3.466E-04  1.374E-04  8.741E-04
Line   4.450E+00  2.585E+00  7.661E+00  1.695E-04  9.847E-05  2.919E-04
Strike Probability, 1/yr                5.161E-04  2.359E-04  1.166E-03
1.0E-5 1/yr design speed                     154.       141.       166.
1.0E-6 1/yr design speed                     189.       179.       202.
1.0E-7 1/yr design speed                     221.       210.       234.

   42   88    3.520E+03 1.0000     99     84     84
Point  6.690E-01  3.199E-01  1.399E+00  3.506E-04  1.676E-04  7.333E-04
Line   5.801E+00  3.830E+00  8.788E+00  1.152E-04  7.602E-05  1.744E-04
Strike Probability, 1/yr                4.657E-04  2.436E-04  9.077E-04
1.0E-5 1/yr design speed                     150.       140.       161.
1.0E-6 1/yr design speed                     186.       177.       197.
1.0E-7 1/yr design speed                     219.       209.       230.

   42   89    3.520E+03 1.0000     91     80     81
Point  1.008E+00  3.890E-01  2.611E+00  4.855E-04  1.874E-04  1.258E-03
Line   6.050E+00  3.621E+00  1.011E+01  1.104E-04  6.607E-05  1.844E-04
Strike Probability, 1/yr                5.959E-04  2.534E-04  1.442E-03
1.0E-5 1/yr design speed                     153.       139.       167.
1.0E-6 1/yr design speed                     189.       176.       202.
1.0E-7 1/yr design speed                     221.       209.       235.

   42   90    3.520E+03 1.0000     99     89     89
Point  1.679E+00  7.230E-01  3.900E+00  8.799E-04  3.789E-04  2.044E-03
Line   6.164E+00  4.212E+00  9.019E+00  1.223E-04  8.361E-05  1.790E-04
Strike Probability, 1/yr                1.002E-03  4.625E-04  2.223E-03
1.0E-5 1/yr design speed                     160.       148.       173.
1.0E-6 1/yr design speed                     195.       183.       208.
1.0E-7 1/yr design speed                     227.       215.       240.

   42   91    3.520E+03 1.0000    133    118    118
Point  7.340E+00  2.029E+00  2.655E+01  5.167E-03  1.428E-03  1.869E-02
Line   8.370E+00  4.993E+00  1.403E+01  2.232E-04  1.331E-04  3.742E-04
Strike Probability, 1/yr                5.391E-03  1.562E-03  1.907E-02
1.0E-5 1/yr design speed                     183.       164.       204.
1.0E-6 1/yr design speed                     216.       198.       237.
1.0E-7 1/yr design speed                     248.       229.       269.
```

```
   42   92    3.520E+03 1.0000    158    138    138
Point  1.478E+00  6.869E-01  3.182E+00  1.236E-03  5.745E-04  2.661E-03
Line   5.295E+00  3.733E+00  7.510E+00  1.677E-04  1.183E-04  2.379E-04
Strike Probability, 1/yr                1.404E-03  6.928E-04  2.899E-03
1.0E-5 1/yr design speed                     165.       154.       177.
1.0E-6 1/yr design speed                     200.       189.       211.
1.0E-7 1/yr design speed                     231.       220.       244.

   42   93    3.520E+03 1.0000    138    119    119
Point  1.193E+00  5.738E-01  2.480E+00  8.713E-04  4.192E-04  1.811E-03
Line   5.929E+00  4.083E+00  8.611E+00  1.641E-04  1.130E-04  2.382E-04
Strike Probability, 1/yr                1.035E-03  5.321E-04  2.050E-03
1.0E-5 1/yr design speed                     161.       151.       172.
1.0E-6 1/yr design speed                     196.       186.       207.
1.0E-7 1/yr design speed                     228.       217.       240.

   42   94    3.520E+03 1.0000    120    108    108
Point  9.929E-01  4.467E-01  2.207E+00  6.307E-04  2.838E-04  1.402E-03
Line   6.059E+00  3.964E+00  9.261E+00  1.458E-04  9.536E-05  2.228E-04
Strike Probability, 1/yr                7.764E-04  3.791E-04  1.624E-03
1.0E-5 1/yr design speed                     157.       146.       169.
1.0E-6 1/yr design speed                     192.       182.       204.
1.0E-7 1/yr design speed                     225.       214.       237.

   42   95    3.520E+03 1.0000    100     89     89
Point  1.198E+00  4.869E-01  2.950E+00  6.344E-04  2.577E-04  1.562E-03
Line   6.125E+00  3.776E+00  9.935E+00  1.228E-04  7.570E-05  1.992E-04
Strike Probability, 1/yr                7.572E-04  3.334E-04  1.761E-03
1.0E-5 1/yr design speed                     156.       143.       170.
1.0E-6 1/yr design speed                     192.       180.       205.
1.0E-7 1/yr design speed                     224.       212.       238.

   42   96    3.520E+03 1.0000    146    124    124
Point  4.107E-01  2.076E-01  8.123E-01  3.174E-04  1.604E-04  6.278E-04
Line   4.225E+00  2.752E+00  6.486E+00  1.237E-04  8.056E-05  1.899E-04
Strike Probability, 1/yr                4.410E-04  2.410E-04  8.176E-04
1.0E-5 1/yr design speed                     150.       140.       160.
1.0E-6 1/yr design speed                     186.       177.       196.
1.0E-7 1/yr design speed                     219.       209.       229.

   42   97    3.520E+03 1.0000    133    101    101
Point  1.696E+00  6.417E-01  4.481E+00  1.194E-03  4.517E-04  3.155E-03
Line   9.588E+00  5.676E+00  1.620E+01  2.557E-04  1.514E-04  4.319E-04
Strike Probability, 1/yr                1.449E-03  6.031E-04  3.587E-03
1.0E-5 1/yr design speed                     167.       154.       181.
1.0E-6 1/yr design speed                     201.       189.       215.
1.0E-7 1/yr design speed                     233.       220.       248.

   42   98    3.520E+03 1.0000    113     94     94
Point  3.151E-01  1.508E-01  6.586E-01  1.885E-04  9.018E-05  3.939E-04
Line   5.153E+00  3.222E+00  8.240E+00  1.167E-04  7.301E-05  1.867E-04
Strike Probability, 1/yr                3.052E-04  1.632E-04  5.806E-04
1.0E-5 1/yr design speed                     146.       135.       156.
1.0E-6 1/yr design speed                     183.       174.       193.
1.0E-7 1/yr design speed                     215.       206.       225.
```

```
   42   99    3.520E+03 1.0000     53     47     47
Point  8.849E-01  1.899E-01  4.122E+00  2.482E-04  5.329E-05  1.156E-03
Line   4.836E+00  2.206E+00  1.060E+01  5.139E-05  2.345E-05  1.126E-04
Strike Probability, 1/yr               2.996E-04  7.673E-05  1.269E-03
1.0E-5 1/yr design speed                    141.       118.       164.
1.0E-6 1/yr design speed                    178.       159.       200.
1.0E-7 1/yr design speed                    211.       193.       233.

   42  100    3.520E+03 1.0000     45     35     35
Point  5.296E-01  1.567E-01  1.789E+00  1.261E-04  3.734E-05  4.262E-04
Line   6.598E+00  3.172E+00  1.372E+01  5.953E-05  2.862E-05  1.238E-04
Strike Probability, 1/yr               1.857E-04  6.596E-05  5.500E-04
1.0E-5 1/yr design speed                    135.       117.       153.
1.0E-6 1/yr design speed                    174.       159.       190.
1.0E-7 1/yr design speed                    207.       193.       223.

   42  101    3.520E+03 1.0000     31     22     22
Point  1.042E+00  1.418E-01  7.654E+00  1.709E-04  2.327E-05  1.256E-03
Line   1.445E+01  3.766E+00  5.547E+01  8.984E-05  2.341E-05  3.448E-04
Strike Probability, 1/yr               2.608E-04  4.667E-05  1.601E-03
1.0E-5 1/yr design speed                    142.       111.       171.
1.0E-6 1/yr design speed                    180.       155.       206.
1.0E-7 1/yr design speed                    212.       190.       238.

   42  102    3.520E+03 1.0000     60     53     53
Point  2.912E-01  9.477E-02  8.947E-01  9.248E-05  3.010E-05  2.842E-04
Line   2.991E+00  1.581E+00  5.656E+00  3.598E-05  1.902E-05  6.804E-05
Strike Probability, 1/yr               1.285E-04  4.912E-05  3.522E-04
1.0E-5 1/yr design speed                    123.       101.       146.
1.0E-6 1/yr design speed                    164.       143.       186.
1.0E-7 1/yr design speed                    201.       180.       222.

   42  103    3.520E+03 1.0000     64     55     55
Point  4.803E-02  2.210E-02  1.044E-01  1.627E-05  7.488E-06  3.535E-05
Line   1.596E+00  9.131E-01  2.790E+00  2.048E-05  1.172E-05  3.580E-05
Strike Probability, 1/yr               3.675E-05  1.920E-05  7.115E-05
1.0E-5 1/yr design speed                    100.        82.       117.
1.0E-6 1/yr design speed                    145.       129.       161.
1.0E-7 1/yr design speed                    183.       167.       199.

   42  104    3.520E+03 1.0000     65     52     52
Point  4.469E-02  1.945E-02  1.026E-01  1.537E-05  6.693E-06  3.531E-05
Line   8.610E-01  5.898E-01  1.257E+00  1.122E-05  7.687E-06  1.638E-05
Strike Probability, 1/yr               2.660E-05  1.438E-05  5.169E-05
1.0E-5 1/yr design speed                     92.        76.       109.
1.0E-6 1/yr design speed                    138.       123.       154.
1.0E-7 1/yr design speed                    177.       162.       193.

   42  105    3.520E+03 1.0000     27     21     21
Point  1.333E-01  2.471E-02  7.187E-01  1.905E-05  3.532E-06  1.027E-04
Line   1.532E+00  7.320E-01  3.207E+00  8.295E-06  3.963E-06  1.736E-05
Strike Probability, 1/yr               2.734E-05  7.495E-06  1.201E-04
1.0E-5 1/yr design speed                     92.        60.       126.
1.0E-6 1/yr design speed                    137.       110.       167.
1.0E-7 1/yr design speed                    177.       151.       205.
```

```
   42  106    3.520E+03 1.0000     18     15     15
Point  4.006E-02  1.408E-02  1.140E-01  3.817E-06  1.341E-06  1.086E-05
Line   1.156E+00  6.515E-01  2.051E+00  4.171E-06  2.351E-06  7.401E-06
Strike Probability, 1/yr                7.988E-06  3.692E-06  1.826E-05
1.0E-5 1/yr design speed                      60.        60.        85.
1.0E-6 1/yr design speed                     116.        97.       135.
1.0E-7 1/yr design speed                     158.       140.       176.

   42  107    3.520E+03 1.0000      3      3      3
Point  1.793E-02  9.163E-03  3.510E-02  2.848E-07  1.455E-07  5.574E-07
Line   1.141E+00  6.434E-01  2.022E+00  6.860E-07  3.870E-07  1.216E-06
Strike Probability, 1/yr                9.708E-07  5.325E-07  1.774E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        85.
1.0E-7 1/yr design speed                     121.       105.       137.

   42  108    3.520E+03 1.0000      4      4      4
Point  3.526E-02  1.278E-02  9.726E-02  7.466E-07  2.707E-07  2.059E-06
Line   8.467E-01  4.886E-01  1.467E+00  6.791E-07  3.918E-07  1.177E-06
Strike Probability, 1/yr                1.426E-06  6.625E-07  3.236E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      77.        60.       100.
1.0E-7 1/yr design speed                     127.       108.       146.

   42  109    3.520E+03 1.0000      5      5      5
Point  8.820E-03  1.138E-03  6.837E-02  2.334E-07  3.012E-08  1.809E-06
Line   2.389E-01  1.275E-01  4.475E-01  2.395E-07  1.278E-07  4.486E-07
Strike Probability, 1/yr                4.729E-07  1.580E-07  2.258E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        89.
1.0E-7 1/yr design speed                     105.        79.       138.

   42  110    3.520E+03 1.0000      7      6      6
Point  2.588E-02  3.772E-03  1.775E-01  9.588E-07  1.398E-07  6.578E-06
Line   6.004E-01  1.999E-01  1.803E+00  8.427E-07  2.806E-07  2.531E-06
Strike Probability, 1/yr                1.802E-06  4.204E-07  9.109E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      82.        60.       121.
1.0E-7 1/yr design speed                     131.       100.       164.

   42  111    3.520E+03 1.0000      3      3      3
Point  5.127E-03  2.472E-03  1.063E-02  8.141E-08  3.925E-08  1.689E-07
Line   6.648E-01  1.795E-01  2.462E+00  3.999E-07  1.080E-07  1.481E-06
Strike Probability, 1/yr                4.813E-07  1.472E-07  1.650E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        84.
1.0E-7 1/yr design speed                     107.        77.       136.

   42  112    3.520E+03 1.0000     19     18     18
Point  1.537E-01  3.020E-02  7.820E-01  1.546E-05  3.038E-06  7.865E-05
Line   2.179E+00  8.714E-01  5.448E+00  8.300E-06  3.319E-06  2.075E-05
Strike Probability, 1/yr                2.376E-05  6.357E-06  9.940E-05
1.0E-5 1/yr design speed                      89.        60.       123.
1.0E-6 1/yr design speed                     135.       107.       165.
1.0E-7 1/yr design speed                     175.       149.       202.
```

```
   42  113    3.520E+03 1.0000     12      9     10
Point  1.791E-02  6.381E-03  5.026E-02  1.138E-06  4.053E-07  3.192E-06
Line   3.570E-01  2.624E-01  4.856E-01  8.589E-07  6.314E-07  1.168E-06
Strike Probability, 1/yr                1.996E-06  1.037E-06  4.361E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      85.        66.       106.
1.0E-7 1/yr design speed                     133.       117.       151.

   42  114    3.520E+03 1.0000     17     15     15
Point  1.049E-02  3.673E-03  2.996E-02  9.440E-07  3.305E-07  2.696E-06
Line   3.944E-01  2.468E-01  6.302E-01  1.344E-06  8.414E-07  2.148E-06
Strike Probability, 1/yr                2.288E-06  1.172E-06  4.844E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      89.        70.       109.
1.0E-7 1/yr design speed                     136.       120.       154.

   42  115    3.520E+03 1.0000      2      2      2
Point  1.847E-02  1.395E-02  2.446E-02  1.955E-07  1.477E-07  2.589E-07
Line   1.272E+00  4.767E-01  3.391E+00  5.099E-07  1.912E-07  1.360E-06
Strike Probability, 1/yr                7.054E-07  3.388E-07  1.619E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        83.
1.0E-7 1/yr design speed                     114.        95.       136.

   42  116    3.520E+03 1.0000      0      0      0

   42  117    3.520E+03 1.0000      1      1      1
Point  5.682E-03  0.000E+00  0.000E+00  3.007E-08  0.000E+00  0.000E+00
Line   1.000E+00  0.000E+00  0.000E+00  2.005E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.306E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      90.        50.        50.

   42  118    3.520E+03 1.0000      0      0      0

   42  119    3.520E+03 1.0000      1      0      0

   42  120    3.520E+03 1.0000      0      0      0

   42  121    3.520E+03 1.0000      2      2      2
Point  3.486E-03  4.523E-04  2.687E-02  3.690E-08  4.788E-09  2.844E-07
Line   3.091E-01  9.296E-02  1.028E+00  1.239E-07  3.728E-08  4.121E-07
Strike Probability, 1/yr                1.609E-07  4.207E-08  6.966E-07
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.        60.
1.0E-7 1/yr design speed                      81.        50.       117.

   42  122    3.520E+03 1.0000      0      0      0

   42  123    3.520E+03 1.0000      0      0      0
```

```
   42  124    1.056E+03 0.3000      2      1      2
Point  2.841E-03  0.000E+00  0.000E+00  1.002E-07  0.000E+00  0.000E+00
Line   3.091E-01  9.296E-02  1.028E+00  4.132E-07  1.243E-07  1.374E-06
Strike Probability, 1/yr                5.134E-07  1.243E-07  1.374E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        79.
1.0E-7 1/yr design speed                     108.        73.       134.

   43   69    3.463E+02 0.1000      0      0      0

   43   70    2.424E+03 0.7000     20     19     19
Point  6.914E-02  2.303E-02  2.075E-01  1.063E-05  3.540E-06  3.190E-05
Line   1.564E+00  7.829E-01  3.123E+00  9.105E-06  4.559E-06  1.819E-05
Strike Probability, 1/yr                1.973E-05  8.099E-06  5.009E-05
1.0E-5 1/yr design speed                      86.        60.       108.
1.0E-6 1/yr design speed                     135.       118.       151.
1.0E-7 1/yr design speed                     172.       157.       187.

   43   71    3.463E+03 1.0000     28     25     25
Point  8.684E-02  3.619E-02  2.084E-01  1.308E-05  5.452E-06  3.139E-05
Line   1.989E+00  1.073E+00  3.689E+00  1.135E-05  6.120E-06  2.105E-05
Strike Probability, 1/yr                2.443E-05  1.157E-05  5.244E-05
1.0E-5 1/yr design speed                      92.        71.       110.
1.0E-6 1/yr design speed                     138.       125.       153.
1.0E-7 1/yr design speed                     176.       163.       188.

   43   72    3.463E+03 1.0000     18     17     17
Point  1.725E-01  5.197E-02  5.727E-01  1.671E-05  5.032E-06  5.546E-05
Line   4.399E+00  1.784E+00  1.085E+01  1.614E-05  6.545E-06  3.978E-05
Strike Probability, 1/yr                3.284E-05  1.158E-05  9.524E-05
1.0E-5 1/yr design speed                     100.        71.       122.
1.0E-6 1/yr design speed                     144.       125.       162.
1.0E-7 1/yr design speed                     180.       163.       197.

   43   73    3.463E+03 1.0000     12      9      9
Point  1.051E-01  1.458E-02  7.576E-01  6.784E-06  9.410E-07  4.891E-05
Line   1.679E+00  4.857E-01  5.801E+00  4.105E-06  1.188E-06  1.419E-05
Strike Probability, 1/yr                1.089E-05  2.129E-06  6.310E-05
1.0E-5 1/yr design speed                      68.        60.       111.
1.0E-6 1/yr design speed                     123.        88.       153.
1.0E-7 1/yr design speed                     162.       136.       190.

   43   74    3.463E+03 1.0000     13     11     11
Point  1.052E+00  7.768E-02  1.424E+01  7.357E-05  5.433E-06  9.962E-04
Line   2.691E+00  1.012E+00  7.158E+00  7.130E-06  2.681E-06  1.896E-05
Strike Probability, 1/yr                8.070E-05  8.114E-06  1.015E-03
1.0E-5 1/yr design speed                     113.        60.       159.
1.0E-6 1/yr design speed                     154.       115.       197.
1.0E-7 1/yr design speed                     191.       155.       233.

   43   75    3.463E+03 1.0000     16     15     15
Point  3.167E-01  6.522E-02  1.538E+00  2.726E-05  5.614E-06  1.324E-04
Line   2.522E+00  1.064E+00  5.977E+00  8.223E-06  3.470E-06  1.949E-05
Strike Probability, 1/yr                3.548E-05  9.084E-06  1.518E-04
1.0E-5 1/yr design speed                      98.        60.       127.
1.0E-6 1/yr design speed                     142.       118.       167.
1.0E-7 1/yr design speed                     179.       158.       203.
```

```
   43   76    1.385E+03 0.4000     18     15     15
Point  6.878E-01  1.320E-01  3.583E+00  1.665E-04  3.197E-05  8.674E-04
Line   6.874E+00  3.037E+00  1.556E+01  6.304E-05  2.785E-05  1.427E-04
Strike Probability, 1/yr               2.296E-04  5.981E-05  1.010E-03
1.0E-5 1/yr design speed                    135.       111.       160.
1.0E-6 1/yr design speed                    173.       152.       197.
1.0E-7 1/yr design speed                    208.       186.       232.

   43   77    6.926E+02 0.2000      4      4      4
Point  3.847E-01  1.190E-01  1.243E+00  4.140E-05  1.281E-05  1.338E-04
Line   7.283E+00  3.062E+00  1.732E+01  2.968E-05  1.248E-05  7.060E-05
Strike Probability, 1/yr               7.108E-05  2.529E-05  2.044E-04
1.0E-5 1/yr design speed                    115.        92.       135.
1.0E-6 1/yr design speed                    156.       138.       174.
1.0E-7 1/yr design speed                    191.       174.       208.

   43   78    1.039E+03 0.3000      5      4      4
Point  2.861E-01  3.570E-02  2.294E+00  2.566E-05  3.201E-06  2.057E-04
Line   4.042E+00  1.348E+00  1.212E+01  1.373E-05  4.579E-06  4.117E-05
Strike Probability, 1/yr               3.939E-05  7.779E-06  2.468E-04
1.0E-5 1/yr design speed                    105.        60.       138.
1.0E-6 1/yr design speed                    150.       124.       177.
1.0E-7 1/yr design speed                    186.       164.       211.

   43   79    1.732E+02 0.0500      0      0      0

   43   82    1.732E+03 0.5000     29     24     24
Point  1.332E+00  1.820E-01  9.743E+00  4.156E-04  5.680E-05  3.040E-03
Line   4.224E+00  1.669E+00  1.069E+01  4.992E-05  1.972E-05  1.264E-04
Strike Probability, 1/yr               4.655E-04  7.653E-05  3.166E-03
1.0E-5 1/yr design speed                    147.       117.       177.
1.0E-6 1/yr design speed                    183.       158.       212.
1.0E-7 1/yr design speed                    216.       192.       245.

   43   83    2.771E+03 0.8000     79     72     72
Point  8.126E-01  3.069E-01  2.152E+00  4.317E-04  1.630E-04  1.143E-03
Line   3.895E+00  2.487E+00  6.099E+00  7.838E-05  5.006E-05  1.227E-04
Strike Probability, 1/yr               5.101E-04  2.131E-04  1.266E-03
1.0E-5 1/yr design speed                    150.       136.       164.
1.0E-6 1/yr design speed                    185.       173.       200.
1.0E-7 1/yr design speed                    218.       206.       233.

   43   84    3.463E+03 1.0000     71     62     62
Point  4.389E-01  1.873E-01  1.028E+00  1.676E-04  7.156E-05  3.927E-04
Line   5.997E+00  3.593E+00  1.001E+01  8.677E-05  5.199E-05  1.448E-04
Strike Probability, 1/yr               2.544E-04  1.236E-04  5.375E-04
1.0E-5 1/yr design speed                    142.       130.       154.
1.0E-6 1/yr design speed                    179.       169.       191.
1.0E-7 1/yr design speed                    212.       202.       224.

   43   85    3.463E+03 1.0000     61     55     55
Point  8.119E-01  2.722E-01  2.422E+00  2.665E-04  8.933E-05  7.948E-04
Line   6.048E+00  3.254E+00  1.124E+01  7.519E-05  4.045E-05  1.398E-04
Strike Probability, 1/yr               3.416E-04  1.298E-04  9.346E-04
1.0E-5 1/yr design speed                    144.       128.       160.
1.0E-6 1/yr design speed                    181.       167.       196.
1.0E-7 1/yr design speed                    214.       201.       229.
```

```
   43   86    1.385E+03 0.4000     19     11     11
Point  2.597E-01  4.484E-02  1.504E+00  6.636E-05  1.146E-05  3.843E-04
Line   2.118E+00  8.365E-01  5.364E+00  2.050E-05  8.098E-06  5.192E-05
Strike Probability, 1/yr               8.686E-05  1.956E-05  4.362E-04
1.0E-5 1/yr design speed                   119.        88.       147.
1.0E-6 1/yr design speed                   160.       138.       184.
1.0E-7 1/yr design speed                   195.       176.       218.

   43   87    6.926E+02 0.2000     12     10     10
Point  8.827E-01  4.237E-02  1.839E+01  2.849E-04  1.368E-05  5.936E-03
Line   5.264E+00  9.707E-01  2.854E+01  6.436E-05  1.187E-05  3.490E-04
Strike Probability, 1/yr               3.493E-04  2.555E-05  6.285E-03
1.0E-5 1/yr design speed                   144.        96.       188.
1.0E-6 1/yr design speed                   181.       144.       222.
1.0E-7 1/yr design speed                   214.       180.       254.

   43   88    3.463E+03 1.0000    159    144    144
Point  6.221E-01  3.400E-01  1.138E+00  5.322E-04  2.908E-04  9.739E-04
Line   5.621E+00  3.909E+00  8.084E+00  1.821E-04  1.267E-04  2.619E-04
Strike Probability, 1/yr               7.143E-04  4.175E-04  1.236E-03
1.0E-5 1/yr design speed                   157.       149.       166.
1.0E-6 1/yr design speed                   193.       184.       202.
1.0E-7 1/yr design speed                   225.       216.       234.

   43   89    3.463E+03 1.0000     97     89     89
Point  7.994E-01  3.354E-01  1.905E+00  4.172E-04  1.750E-04  9.942E-04
Line   6.083E+00  3.743E+00  9.886E+00  1.202E-04  7.398E-05  1.954E-04
Strike Probability, 1/yr               5.374E-04  2.490E-04  1.190E-03
1.0E-5 1/yr design speed                   152.       140.       165.
1.0E-6 1/yr design speed                   188.       177.       200.
1.0E-7 1/yr design speed                   220.       209.       233.

   43   90    3.463E+03 1.0000     63     54     54
Point  1.233E+00  5.493E-01  2.769E+00  4.180E-04  1.862E-04  9.385E-04
Line   7.414E+00  5.023E+00  1.094E+01  9.518E-05  6.449E-05  1.405E-04
Strike Probability, 1/yr               5.132E-04  2.507E-04  1.079E-03
1.0E-5 1/yr design speed                   150.       139.       162.
1.0E-6 1/yr design speed                   186.       176.       198.
1.0E-7 1/yr design speed                   219.       208.       231.

   43   91    3.463E+03 1.0000     61     53     53
Point  6.830E-01  2.564E-01  1.819E+00  2.242E-04  8.416E-05  5.970E-04
Line   7.960E+00  4.219E+00  1.502E+01  9.895E-05  5.245E-05  1.867E-04
Strike Probability, 1/yr               3.231E-04  1.366E-04  7.837E-04
1.0E-5 1/yr design speed                   145.       131.       159.
1.0E-6 1/yr design speed                   182.       170.       196.
1.0E-7 1/yr design speed                   215.       203.       228.

   43   92    3.463E+03 1.0000    115    106    106
Point  1.283E+00  5.607E-01  2.937E+00  7.940E-04  3.469E-04  1.817E-03
Line   4.813E+00  3.271E+00  7.080E+00  1.128E-04  7.666E-05  1.659E-04
Strike Probability, 1/yr               9.068E-04  4.236E-04  1.983E-03
1.0E-5 1/yr design speed                   158.       146.       171.
1.0E-6 1/yr design speed                   193.       182.       206.
1.0E-7 1/yr design speed                   226.       214.       239.
```

```
   43   93    3.463E+03 1.0000    137    123    123
Point  9.237E-01  4.479E-01  1.905E+00  6.809E-04  3.301E-04  1.404E-03
Line   5.952E+00  4.008E+00  8.839E+00  1.662E-04  1.119E-04  2.468E-04
Strike Probability, 1/yr                8.470E-04  4.420E-04  1.651E-03
1.0E-5 1/yr design speed                     159.       149.       170.
1.0E-6 1/yr design speed                     194.       184.       205.
1.0E-7 1/yr design speed                     226.       216.       237.

   43   94    3.463E+03 1.0000     93     79     79
Point  8.996E-01  3.592E-01  2.253E+00  4.501E-04  1.797E-04  1.127E-03
Line   6.740E+00  4.087E+00  1.112E+01  1.277E-04  7.746E-05  2.107E-04
Strike Probability, 1/yr                5.778E-04  2.572E-04  1.338E-03
1.0E-5 1/yr design speed                     153.       140.       166.
1.0E-6 1/yr design speed                     189.       178.       202.
1.0E-7 1/yr design speed                     221.       210.       234.

   43   95    3.463E+03 1.0000    120    107    107
Point  1.145E+00  5.058E-01  2.590E+00  7.390E-04  3.266E-04  1.672E-03
Line   5.556E+00  3.539E+00  8.725E+00  1.359E-04  8.653E-05  2.134E-04
Strike Probability, 1/yr                8.749E-04  4.131E-04  1.886E-03
1.0E-5 1/yr design speed                     158.       147.       171.
1.0E-6 1/yr design speed                     193.       182.       206.
1.0E-7 1/yr design speed                     226.       214.       239.

   43   96    3.463E+03 1.0000    140    112    112
Point  3.543E-01  1.850E-01  6.787E-01  2.669E-04  1.393E-04  5.112E-04
Line   3.007E+00  2.063E+00  4.382E+00  8.579E-05  5.887E-05  1.250E-04
Strike Probability, 1/yr                3.527E-04  1.982E-04  6.362E-04
1.0E-5 1/yr design speed                     145.       136.       155.
1.0E-6 1/yr design speed                     182.       174.       192.
1.0E-7 1/yr design speed                     215.       206.       225.

   43   97    3.463E+03 1.0000    142    102    102
Point  7.372E-01  3.257E-01  1.669E+00  5.632E-04  2.488E-04  1.275E-03
Line   4.062E+00  2.686E+00  6.143E+00  1.175E-04  7.773E-05  1.778E-04
Strike Probability, 1/yr                6.808E-04  3.265E-04  1.453E-03
1.0E-5 1/yr design speed                     155.       143.       167.
1.0E-6 1/yr design speed                     190.       180.       202.
1.0E-7 1/yr design speed                     223.       212.       235.

   43   98    3.463E+03 1.0000    107     72     72
Point  9.579E-01  2.927E-01  3.135E+00  5.514E-04  1.685E-04  1.805E-03
Line   3.602E+00  2.123E+00  6.110E+00  7.854E-05  4.630E-05  1.332E-04
Strike Probability, 1/yr                6.300E-04  2.148E-04  1.938E-03
1.0E-5 1/yr design speed                     152.       135.       170.
1.0E-6 1/yr design speed                     188.       173.       205.
1.0E-7 1/yr design speed                     220.       206.       238.

   43   99    3.463E+03 1.0000     71     50     50
Point  1.868E+00  3.572E-01  9.771E+00  7.136E-04  1.364E-04  3.732E-03
Line   4.813E+00  2.206E+00  1.050E+01  6.964E-05  3.191E-05  1.520E-04
Strike Probability, 1/yr                7.832E-04  1.684E-04  3.884E-03
1.0E-5 1/yr design speed                     155.       130.       180.
1.0E-6 1/yr design speed                     190.       168.       215.
1.0E-7 1/yr design speed                     223.       202.       248.
```

```
   43  100    3.463E+03 1.0000     52     35     36
Point  1.405E-01  2.380E-02  8.289E-01  3.929E-05  6.658E-06  2.319E-04
Line   1.151E+00  6.199E-01  2.137E+00  1.220E-05  6.569E-06  2.264E-05
Strike Probability, 1/yr               5.149E-05  1.323E-05  2.545E-04
1.0E-5 1/yr design speed                    109.        77.       136.
1.0E-6 1/yr design speed                    152.       132.       175.
1.0E-7 1/yr design speed                    188.       171.       210.

   43  101    3.463E+03 1.0000     45     29     29
Point  2.279E+00  2.048E-01  2.536E+01  5.518E-04  4.958E-05  6.140E-03
Line   6.250E+00  2.260E+00  1.728E+01  5.732E-05  2.073E-05  1.585E-04
Strike Probability, 1/yr               6.091E-04  7.031E-05  6.299E-03
1.0E-5 1/yr design speed                    151.       116.       187.
1.0E-6 1/yr design speed                    187.       157.       221.
1.0E-7 1/yr design speed                    219.       192.       254.

   43  102    3.463E+03 1.0000     15     11     11
Point  5.617E+00  1.246E-01  2.532E+02  4.533E-04  1.006E-05  2.043E-02
Line   6.600E+00  1.721E+00  2.531E+01  2.017E-05  5.261E-06  7.736E-05
Strike Probability, 1/yr               4.735E-04  1.532E-05  2.051E-02
1.0E-5 1/yr design speed                    145.        76.       213.
1.0E-6 1/yr design speed                    184.       122.       247.
1.0E-7 1/yr design speed                    220.       161.       281.

   43  103    3.463E+03 1.0000     39     22     24
Point  2.388E-01  3.865E-02  1.476E+00  5.011E-05  8.109E-06  3.097E-04
Line   2.259E+00  9.698E-01  5.261E+00  1.795E-05  7.708E-06  4.181E-05
Strike Probability, 1/yr               6.806E-05  1.582E-05  3.515E-04
1.0E-5 1/yr design speed                    111.        78.       146.
1.0E-6 1/yr design speed                    153.       124.       185.
1.0E-7 1/yr design speed                    191.       163.       221.

   43  104    3.463E+03 1.0000     31     26     27
Point  3.824E-01  8.789E-02  1.664E+00  6.378E-05  1.466E-05  2.775E-04
Line   4.554E+00  2.112E+00  9.823E+00  2.877E-05  1.334E-05  6.206E-05
Strike Probability, 1/yr               9.255E-05  2.800E-05  3.396E-04
1.0E-5 1/yr design speed                    117.        90.       146.
1.0E-6 1/yr design speed                    159.       134.       185.
1.0E-7 1/yr design speed                    196.       172.       221.

   43  105    3.463E+03 1.0000     27     26     26
Point  3.654E-01  7.171E-02  1.862E+00  5.308E-05  1.042E-05  2.705E-04
Line   3.855E+00  1.618E+00  9.183E+00  2.121E-05  8.905E-06  5.053E-05
Strike Probability, 1/yr               7.429E-05  1.932E-05  3.210E-04
1.0E-5 1/yr design speed                    113.        82.       144.
1.0E-6 1/yr design speed                    155.       127.       184.
1.0E-7 1/yr design speed                    193.       166.       220.

   43  106    3.463E+03 1.0000     14     10     10
Point  3.442E-01  3.611E-02  3.281E+00  2.593E-05  2.720E-06  2.471E-04
Line   4.834E+00  1.141E+00  2.049E+01  1.379E-05  3.254E-06  5.846E-05
Strike Probability, 1/yr               3.972E-05  5.974E-06  3.056E-04
1.0E-5 1/yr design speed                    101.        60.       144.
1.0E-6 1/yr design speed                    144.       106.       183.
1.0E-7 1/yr design speed                    183.       148.       220.
```

```
   43  107    3.463E+03 1.0000      9      6      6
Point  3.423E-02  9.105E-03  1.287E-01  1.658E-06  4.408E-07  6.232E-06
Line   7.918E-01  3.522E-01  1.780E+00  1.452E-06  6.459E-07  3.265E-06
Strike Probability, 1/yr                3.110E-06  1.087E-06  9.497E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      96.        68.       123.
1.0E-7 1/yr design speed                     141.       118.       165.

   43  108    3.463E+03 1.0000      9      7      7
Point  6.928E-02  1.607E-02  2.987E-01  3.354E-06  7.779E-07  1.446E-05
Line   2.250E+00  8.500E-01  5.953E+00  4.126E-06  1.559E-06  1.092E-05
Strike Probability, 1/yr                7.480E-06  2.337E-06  2.538E-05
1.0E-5 1/yr design speed                      60.        60.        94.
1.0E-6 1/yr design speed                     115.        87.       142.
1.0E-7 1/yr design speed                     157.       132.       182.

   43  109    3.463E+03 1.0000      2      2      2
Point  8.089E-01  8.617E-03  7.593E+01  8.704E-06  9.272E-08  8.171E-04
Line   1.330E+00  6.200E-01  2.855E+00  5.422E-07  2.527E-07  1.164E-06
Strike Probability, 1/yr                9.246E-06  3.454E-07  8.182E-04
1.0E-5 1/yr design speed                      60.        60.       160.
1.0E-6 1/yr design speed                     115.        60.       198.
1.0E-7 1/yr design speed                     157.        96.       234.

   43  110    3.463E+03 1.0000      2      1      1
Point  1.668E+01  0.000E+00  0.000E+00  1.795E-04  0.000E+00  0.000E+00
Line   1.151E+01  0.000E+00  0.000E+00  4.692E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.841E-04  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     128.        50.        50.
1.0E-6 1/yr design speed                     168.        50.        50.
1.0E-7 1/yr design speed                     205.        50.        50.

   43  111    3.463E+03 1.0000     18     16     16
Point  2.209E-02  6.474E-03  7.539E-02  2.139E-06  6.270E-07  7.301E-06
Line   1.325E+00  5.938E-01  2.957E+00  4.861E-06  2.178E-06  1.085E-05
Strike Probability, 1/yr                7.000E-06  2.805E-06  1.815E-05
1.0E-5 1/yr design speed                      60.        60.        85.
1.0E-6 1/yr design speed                     114.        92.       137.
1.0E-7 1/yr design speed                     157.       136.       177.

   43  112    3.463E+03 1.0000     20     17     17
Point  4.600E-01  1.094E-01  1.934E+00  4.950E-05  1.177E-05  2.081E-04
Line   3.581E+00  1.926E+00  6.661E+00  1.460E-05  7.848E-06  2.715E-05
Strike Probability, 1/yr                6.409E-05  1.962E-05  2.353E-04
1.0E-5 1/yr design speed                     109.        82.       138.
1.0E-6 1/yr design speed                     152.       127.       179.
1.0E-7 1/yr design speed                     190.       166.       215.

   43  113    3.463E+03 1.0000      5      4      5
Point  7.135E-03  3.448E-03  1.476E-02  1.919E-07  9.276E-08  3.972E-07
Line   7.071E-01  1.998E-01  2.502E+00  7.205E-07  2.036E-07  2.550E-06
Strike Probability, 1/yr                9.124E-07  2.964E-07  2.947E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.       100.
1.0E-7 1/yr design speed                     120.        93.       147.
```

```
   43  114    3.463E+03 1.0000      8      8      8
Point  1.364E-02  3.572E-03  5.209E-02  5.871E-07  1.537E-07  2.242E-06
Line   7.796E-01  3.169E-01  1.918E+00  1.271E-06  5.166E-07  3.127E-06
Strike Probability, 1/yr               1.858E-06  6.704E-07  5.369E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     84.        60.       112.
1.0E-7 1/yr design speed                    133.       110.       156.

   43  115    3.463E+03 1.0000      1      0      0

   43  116    3.463E+03 1.0000     23     21     21
Point  1.615E-02  5.987E-03  4.358E-02  1.999E-06  7.409E-07  5.392E-06
Line   6.467E-01  3.609E-01  1.159E+00  3.031E-06  1.691E-06  5.433E-06
Strike Probability, 1/yr               5.030E-06  2.432E-06  1.083E-05
1.0E-5 1/yr design speed                     60.        60.        68.
1.0E-6 1/yr design speed                    107.        88.       126.
1.0E-7 1/yr design speed                    151.       133.       168.

   43  117    3.463E+03 1.0000      6      6      6
Point  2.568E-01  1.680E-02  3.923E+00  8.288E-06  5.424E-07  1.266E-04
Line   3.178E+00  8.231E-01  1.227E+01  3.886E-06  1.006E-06  1.500E-05
Strike Probability, 1/yr               1.217E-05  1.549E-06  1.416E-04
1.0E-5 1/yr design speed                     72.        60.       129.
1.0E-6 1/yr design speed                    123.        78.       170.
1.0E-7 1/yr design speed                    163.       125.       207.

   43  118    3.463E+03 1.0000      2      2      2
Point  3.486E-03  4.523E-04  2.687E-02  3.751E-08  4.867E-09  2.891E-07
Line   1.502E-01  9.802E-02  2.301E-01  6.121E-08  3.995E-08  9.378E-08
Strike Probability, 1/yr               9.872E-08  4.482E-08  3.829E-07
1.0E-5 1/yr design speed                     50.        50.        60.
1.0E-6 1/yr design speed                     50.        50.        60.
1.0E-7 1/yr design speed                     50.        50.       103.

   43  119    3.463E+03 1.0000      2      2      2
Point  1.756E-02  5.282E-03  5.840E-02  1.890E-07  5.683E-08  6.284E-07
Line   3.512E-01  1.954E-01  6.312E-01  1.431E-07  7.966E-08  2.573E-07
Strike Probability, 1/yr               3.321E-07  1.365E-07  8.856E-07
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     60.        60.        60.
1.0E-7 1/yr design speed                     97.        75.       121.

   43  120    3.463E+03 1.0000      2      2      2
Point  4.266E-02  2.785E-02  6.537E-02  4.591E-07  2.996E-07  7.033E-07
Line   1.502E+00  9.802E-01  2.301E+00  6.121E-07  3.995E-07  9.378E-07
Strike Probability, 1/yr               1.071E-06  6.991E-07  1.641E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     68.        60.        82.
1.0E-7 1/yr design speed                    122.       109.       135.

   43  121    3.463E+03 1.0000      0      0      0

   43  122    3.463E+03 1.0000      0      0      0
```

```
   43  123    3.463E+03 1.0000      1      1      1
Point  3.267E-02  0.000E+00  0.000E+00  1.758E-07  0.000E+00  0.000E+00
Line   2.300E+00  0.000E+00  0.000E+00  4.687E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                6.445E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     113.        50.        50.

   43  124    6.926E+02 0.2000      0      0      0

   44   66    1.703E+02 0.0500      0      0      0

   44   67    1.703E+03 0.5000      2      2      2
Point  2.484E-01  1.333E-01  4.629E-01  5.436E-06  2.917E-06  1.013E-05
Line   1.402E+01  8.718E+00  2.256E+01  1.163E-05  7.227E-06  1.870E-05
Strike Probability, 1/yr                1.706E-05  1.014E-05  2.883E-05
1.0E-5 1/yr design speed                      84.        66.       100.
1.0E-6 1/yr design speed                     135.       125.       145.
1.0E-7 1/yr design speed                     172.       162.       181.

   44   68    2.384E+03 0.7000      5      5      5
Point  4.155E-02  1.378E-02  1.253E-01  1.624E-06  5.384E-07  4.898E-06
Line   1.012E+00  4.908E-01  2.088E+00  1.499E-06  7.266E-07  3.091E-06
Strike Probability, 1/yr                3.123E-06  1.265E-06  7.990E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      99.        75.       118.
1.0E-7 1/yr design speed                     143.       127.       159.

   44   69    3.405E+03 1.0000     19     18     18
Point  1.900E-01  6.780E-02  5.325E-01  1.975E-05  7.049E-06  5.535E-05
Line   4.016E+00  1.945E+00  8.290E+00  1.581E-05  7.659E-06  3.265E-05
Strike Probability, 1/yr                3.557E-05  1.471E-05  8.800E-05
1.0E-5 1/yr design speed                     101.        78.       120.
1.0E-6 1/yr design speed                     145.       129.       160.
1.0E-7 1/yr design speed                     181.       166.       196.

   44   70    3.405E+03 1.0000     20     19     19
Point  9.725E-02  3.012E-02  3.139E-01  1.064E-05  3.296E-06  3.435E-05
Line   1.123E+00  6.473E-01  1.947E+00  4.653E-06  2.683E-06  8.069E-06
Strike Probability, 1/yr                1.529E-05  5.980E-06  4.242E-05
1.0E-5 1/yr design speed                      79.        60.       103.
1.0E-6 1/yr design speed                     128.       111.       146.
1.0E-7 1/yr design speed                     167.       152.       184.

   44   71    3.405E+03 1.0000      5      5      5
Point  2.720E-01  6.277E-03  1.179E+01  7.441E-06  1.717E-07  3.225E-04
Line   1.544E+00  2.876E-01  8.296E+00  1.600E-06  2.980E-07  8.597E-06
Strike Probability, 1/yr                9.042E-06  4.697E-07  3.311E-04
1.0E-5 1/yr design speed                      60.        60.       139.
1.0E-6 1/yr design speed                     116.        60.       179.
1.0E-7 1/yr design speed                     157.       108.       216.
```

```
   44   72    3.405E+03 1.0000     11     10     10
Point  2.574E-01  1.024E-01  6.468E-01  1.549E-05  6.165E-06  3.893E-05
Line   2.827E+00  1.768E+00  4.519E+00  6.445E-06  4.031E-06  1.030E-05
Strike Probability, 1/yr               2.194E-05  1.020E-05  4.923E-05
1.0E-5 1/yr design speed                     87.        66.       106.
1.0E-6 1/yr design speed                    134.       120.       149.
1.0E-7 1/yr design speed                    173.       159.       186.

   44   73    3.405E+03 1.0000     14     11     11
Point  1.092E+00  5.045E-02  2.363E+01  8.364E-05  3.865E-06  1.810E-03
Line   2.811E+00  8.745E-01  9.037E+00  8.157E-06  2.537E-06  2.622E-05
Strike Probability, 1/yr               9.180E-05  6.402E-06  1.836E-03
1.0E-5 1/yr design speed                    115.        60.       169.
1.0E-6 1/yr design speed                    156.       111.       206.
1.0E-7 1/yr design speed                    193.       152.       242.

   44   74    3.405E+03 1.0000      5      4      4
Point  3.144E-01  2.602E-02  3.799E+00  8.601E-06  7.118E-07  1.039E-04
Line   1.828E+00  9.099E-01  3.671E+00  1.894E-06  9.429E-07  3.804E-06
Strike Probability, 1/yr               1.049E-05  1.655E-06  1.077E-04
1.0E-5 1/yr design speed                     67.        60.       119.
1.0E-6 1/yr design speed                    119.        82.       160.
1.0E-7 1/yr design speed                    160.       131.       198.

   44   75    2.384E+03 0.7000      6      6      6
Point  6.684E-02  4.172E-03  1.071E+00  3.135E-06  1.956E-07  5.022E-05
Line   1.839E+00  4.773E-01  7.087E+00  3.267E-06  8.479E-07  1.259E-05
Strike Probability, 1/yr               6.402E-06  1.044E-06  6.281E-05
1.0E-5 1/yr design speed                     60.        60.       111.
1.0E-6 1/yr design speed                    114.        67.       153.
1.0E-7 1/yr design speed                    155.       126.       190.

   44   82    1.703E+02 0.0500      0      0      0

   44   83    2.384E+03 0.7000     35     33     33
Point  6.564E-01  2.219E-01  1.942E+00  1.796E-04  6.072E-05  5.311E-04
Line   4.661E+00  2.797E+00  7.770E+00  4.831E-05  2.898E-05  8.052E-05
Strike Probability, 1/yr               2.279E-04  8.970E-05  6.117E-04
1.0E-5 1/yr design speed                    137.       122.       153.
1.0E-6 1/yr design speed                    175.       162.       189.
1.0E-7 1/yr design speed                    208.       196.       223.

   44   84    3.405E+03 1.0000     45     42     42
Point  3.595E-01  1.173E-01  1.102E+00  8.852E-05  2.888E-05  2.714E-04
Line   4.289E+00  2.170E+00  8.477E+00  4.000E-05  2.024E-05  7.906E-05
Strike Probability, 1/yr               1.285E-04  4.912E-05  3.504E-04
1.0E-5 1/yr design speed                    129.       110.       145.
1.0E-6 1/yr design speed                    168.       154.       183.
1.0E-7 1/yr design speed                    202.       189.       217.

   44   85    3.065E+03 0.9000     34     29     29
Point  1.734E+00  3.481E-01  8.640E+00  3.585E-04  7.196E-05  1.786E-03
Line   8.239E+00  3.636E+00  1.867E+01  6.451E-05  2.847E-05  1.461E-04
Strike Probability, 1/yr               4.230E-04  1.004E-04  1.932E-03
1.0E-5 1/yr design speed                    146.       123.       170.
1.0E-6 1/yr design speed                    183.       163.       205.
1.0E-7 1/yr design speed                    216.       197.       238.
```

```
   44   86    6.811E+02 0.2000      3      3      3
Point  1.820E+00  2.918E-01  1.135E+01  1.494E-04  2.395E-05  9.316E-04
Line   1.013E+01  7.079E+00  1.450E+01  3.150E-05  2.201E-05  4.508E-05
Strike Probability, 1/yr                1.809E-04  4.596E-05  9.766E-04
1.0E-5 1/yr design speed                     132.       110.       158.
1.0E-6 1/yr design speed                     170.       154.       194.
1.0E-7 1/yr design speed                     204.       189.       228.

   44   87    1.362E+03 0.4000     36     27     27
Point  1.247E+00  2.898E-01  5.368E+00  6.142E-04  1.427E-04  2.643E-03
Line   5.526E+00  2.569E+00  1.189E+01  1.031E-04  4.792E-05  2.217E-04
Strike Probability, 1/yr                7.172E-04  1.906E-04  2.865E-03
1.0E-5 1/yr design speed                     155.       134.       176.
1.0E-6 1/yr design speed                     190.       172.       211.
1.0E-7 1/yr design speed                     223.       205.       244.

   44   88    3.405E+03 1.0000     71     61     61
Point  8.064E-01  3.514E-01  1.850E+00  3.133E-04  1.365E-04  7.189E-04
Line   6.397E+00  3.933E+00  1.040E+01  9.413E-05  5.787E-05  1.531E-04
Strike Probability, 1/yr                4.074E-04  1.944E-04  8.720E-04
1.0E-5 1/yr design speed                     148.       135.       160.
1.0E-6 1/yr design speed                     184.       173.       196.
1.0E-7 1/yr design speed                     217.       206.       229.

   44   89    3.405E+03 1.0000     67     65     65
Point  1.517E+00  5.705E-01  4.034E+00  5.561E-04  2.091E-04  1.479E-03
Line   9.204E+00  5.176E+00  1.637E+01  1.278E-04  7.188E-05  2.273E-04
Strike Probability, 1/yr                6.839E-04  2.810E-04  1.706E-03
1.0E-5 1/yr design speed                     155.       141.       170.
1.0E-6 1/yr design speed                     191.       178.       205.
1.0E-7 1/yr design speed                     223.       210.       237.

   44   90    3.405E+03 1.0000     65     63     63
Point  1.398E+00  5.932E-01  3.293E+00  4.970E-04  2.110E-04  1.171E-03
Line   6.902E+00  4.399E+00  1.083E+01  9.298E-05  5.926E-05  1.459E-04
Strike Probability, 1/yr                5.900E-04  2.702E-04  1.317E-03
1.0E-5 1/yr design speed                     152.       139.       165.
1.0E-6 1/yr design speed                     188.       176.       201.
1.0E-7 1/yr design speed                     220.       209.       234.

   44   91    3.405E+03 1.0000     81     75     75
Point  1.532E+00  6.709E-01  3.499E+00  6.790E-04  2.974E-04  1.551E-03
Line   8.242E+00  5.216E+00  1.302E+01  1.384E-04  8.757E-05  2.186E-04
Strike Probability, 1/yr                8.174E-04  3.849E-04  1.769E-03
1.0E-5 1/yr design speed                     158.       146.       170.
1.0E-6 1/yr design speed                     193.       182.       205.
1.0E-7 1/yr design speed                     225.       213.       238.

   44   92    3.405E+03 1.0000     90     82     82
Point  5.394E-01  2.391E-01  1.216E+00  2.656E-04  1.178E-04  5.990E-04
Line   4.098E+00  2.571E+00  6.532E+00  7.644E-05  4.795E-05  1.218E-04
Strike Probability, 1/yr                3.420E-04  1.657E-04  7.209E-04
1.0E-5 1/yr design speed                     144.       132.       156.
1.0E-6 1/yr design speed                     181.       171.       193.
1.0E-7 1/yr design speed                     214.       204.       226.
```

```
   44   93    3.405E+03 1.0000    134    125    125
Point  1.296E+00  5.405E-01  3.105E+00  9.499E-04  3.963E-04  2.277E-03
Line   4.470E+00  2.939E+00  6.799E+00  1.241E-04  8.161E-05  1.888E-04
Strike Probability, 1/yr                1.074E-03  4.779E-04  2.466E-03
1.0E-5 1/yr design speed                     160.       148.       174.
1.0E-6 1/yr design speed                     195.       183.       209.
1.0E-7 1/yr design speed                     228.       215.       242.

   44   94    3.405E+03 1.0000    104     97     97
Point  1.397E+00  5.094E-01  3.830E+00  7.948E-04  2.899E-04  2.179E-03
Line   4.244E+00  2.646E+00  6.808E+00  9.148E-05  5.703E-05  1.467E-04
Strike Probability, 1/yr                8.863E-04  3.469E-04  2.326E-03
1.0E-5 1/yr design speed                     157.       142.       173.
1.0E-6 1/yr design speed                     192.       179.       208.
1.0E-7 1/yr design speed                     225.       211.       241.

   44   95    3.405E+03 1.0000     88     80     80
Point  6.475E-01  2.683E-01  1.563E+00  3.118E-04  1.292E-04  7.526E-04
Line   5.887E+00  3.568E+00  9.714E+00  1.074E-04  6.507E-05  1.772E-04
Strike Probability, 1/yr                4.192E-04  1.942E-04  9.298E-04
1.0E-5 1/yr design speed                     149.       136.       161.
1.0E-6 1/yr design speed                     185.       174.       197.
1.0E-7 1/yr design speed                     217.       207.       230.

   44   96    3.405E+03 1.0000     78     56     56
Point  1.929E-01  8.258E-02  4.504E-01  8.230E-05  3.524E-05  1.922E-04
Line   5.133E+00  2.679E+00  9.836E+00  8.298E-05  4.331E-05  1.590E-04
Strike Probability, 1/yr                1.653E-04  7.855E-05  3.512E-04
1.0E-5 1/yr design speed                     137.       123.       150.
1.0E-6 1/yr design speed                     176.       164.       187.
1.0E-7 1/yr design speed                     209.       198.       220.

   44   97    3.405E+03 1.0000    121     84     84
Point  3.798E-01  1.427E-01  1.010E+00  2.514E-04  9.451E-05  6.689E-04
Line   3.073E+00  1.827E+00  5.170E+00  7.706E-05  4.581E-05  1.296E-04
Strike Probability, 1/yr                3.285E-04  1.403E-04  7.986E-04
1.0E-5 1/yr design speed                     144.       130.       158.
1.0E-6 1/yr design speed                     181.       169.       194.
1.0E-7 1/yr design speed                     214.       202.       227.

   44   98    3.405E+03 1.0000     62     37     37
Point  9.722E-01  1.950E-01  4.849E+00  3.298E-04  6.613E-05  1.645E-03
Line   3.976E+00  1.910E+00  8.274E+00  5.109E-05  2.455E-05  1.063E-04
Strike Probability, 1/yr                3.809E-04  9.068E-05  1.751E-03
1.0E-5 1/yr design speed                     144.       121.       168.
1.0E-6 1/yr design speed                     181.       161.       204.
1.0E-7 1/yr design speed                     214.       195.       237.

   44   99    3.405E+03 1.0000     38     23     23
Point  4.172E-02  1.191E-02  1.461E-01  8.674E-06  2.477E-06  3.037E-05
Line   7.231E-01  4.137E-01  1.264E+00  5.695E-06  3.258E-06  9.955E-06
Strike Probability, 1/yr                1.437E-05  5.735E-06  4.033E-05
1.0E-5 1/yr design speed                      79.        60.       104.
1.0E-6 1/yr design speed                     132.       116.       149.
1.0E-7 1/yr design speed                     172.       159.       186.
```

```
   44  100    3.405E+03 1.0000     38     22     22
Point  1.370E-01  2.237E-02  8.386E-01  2.848E-05  4.650E-06  1.744E-04
Line   1.489E+00  6.326E-01  3.503E+00  1.172E-05  4.982E-06  2.759E-05
Strike Probability, 1/yr               4.020E-05  9.633E-06  2.020E-04
1.0E-5 1/yr design speed                    104.        60.       133.
1.0E-6 1/yr design speed                    149.       127.       173.
1.0E-7 1/yr design speed                    185.       167.       207.

   44  101    3.405E+03 1.0000     31     18     18
Point  9.995E-02  2.412E-02  4.141E-01  1.695E-05  4.092E-06  7.024E-05
Line   1.621E+00  8.613E-01  3.049E+00  1.041E-05  5.534E-06  1.959E-05
Strike Probability, 1/yr               2.737E-05  9.626E-06  8.983E-05
1.0E-5 1/yr design speed                     97.        60.       120.
1.0E-6 1/yr design speed                    144.       128.       161.
1.0E-7 1/yr design speed                    181.       167.       197.

   44  102    3.405E+03 1.0000     31     19     19
Point  4.174E-02  6.913E-03  2.520E-01  7.080E-06  1.172E-06  4.275E-05
Line   9.510E-01  4.295E-01  2.106E+00  6.110E-06  2.759E-06  1.353E-05
Strike Probability, 1/yr               1.319E-05  3.932E-06  5.628E-05
1.0E-5 1/yr design speed                     75.        60.       111.
1.0E-6 1/yr design speed                    125.        99.       155.
1.0E-7 1/yr design speed                    166.       142.       194.

   44  103    3.405E+03 1.0000     56     36     36
Point  4.819E-01  1.255E-01  1.850E+00  1.477E-04  3.846E-05  5.669E-04
Line   3.226E+00  1.620E+00  6.421E+00  3.744E-05  1.881E-05  7.452E-05
Strike Probability, 1/yr               1.851E-04  5.727E-05  6.415E-04
1.0E-5 1/yr design speed                    130.       104.       156.
1.0E-6 1/yr design speed                    170.       145.       195.
1.0E-7 1/yr design speed                    206.       182.       231.

   44  104    3.405E+03 1.0000     35     29     29
Point  9.902E-01  1.465E-01  6.692E+00  1.896E-04  2.806E-05  1.282E-03
Line   2.840E+00  1.426E+00  5.657E+00  2.060E-05  1.034E-05  4.103E-05
Strike Probability, 1/yr               2.102E-04  3.840E-05  1.323E-03
1.0E-5 1/yr design speed                    131.        96.       168.
1.0E-6 1/yr design speed                    171.       138.       206.
1.0E-7 1/yr design speed                    208.       176.       241.

   44  105    3.405E+03 1.0000     57     39     39
Point  1.434E-01  5.349E-02  3.846E-01  4.473E-05  1.668E-05  1.199E-04
Line   2.461E+00  1.445E+00  4.193E+00  2.908E-05  1.707E-05  4.953E-05
Strike Probability, 1/yr               7.381E-05  3.375E-05  1.695E-04
1.0E-5 1/yr design speed                    113.        94.       133.
1.0E-6 1/yr design speed                    156.       137.       174.
1.0E-7 1/yr design speed                    193.       176.       211.

   44  106    3.405E+03 1.0000     13      8      8
Point  4.093E-02  8.740E-03  1.917E-01  2.911E-06  6.217E-07  1.363E-05
Line   7.751E-01  3.441E-01  1.746E+00  2.088E-06  9.272E-07  4.704E-06
Strike Probability, 1/yr               5.000E-06  1.549E-06  1.834E-05
1.0E-5 1/yr design speed                     60.        60.        84.
1.0E-6 1/yr design speed                    106.        78.       135.
1.0E-7 1/yr design speed                    149.       125.       175.
```

```
   44  107    3.405E+03 1.0000     14     10     10
Point  1.157E-01  1.011E-02  1.325E+00  8.866E-06  7.745E-07  1.015E-04
Line   1.397E+00  4.256E-01  4.587E+00  4.054E-06  1.235E-06  1.331E-05
Strike Probability, 1/yr                1.292E-05  2.009E-06  1.148E-04
1.0E-5 1/yr design speed                      74.        60.       125.
1.0E-6 1/yr design speed                     124.        83.       166.
1.0E-7 1/yr design speed                     164.       129.       204.

   44  108    3.405E+03 1.0000     23     18     18
Point  4.399E-02  1.534E-02  1.261E-01  5.535E-06  1.931E-06  1.587E-05
Line   7.705E-01  4.689E-01  1.266E+00  3.673E-06  2.235E-06  6.035E-06
Strike Probability, 1/yr                9.208E-06  4.166E-06  2.191E-05
1.0E-5 1/yr design speed                      60.        60.        89.
1.0E-6 1/yr design speed                     118.        99.       138.
1.0E-7 1/yr design speed                     159.       141.       178.

   44  109    3.405E+03 1.0000      2      2      2
Point  1.019E+03  3.966E-06  2.616E+11  1.115E-02  4.340E-11  2.863E+06
Line   7.601E+00  7.443E-01  7.762E+01  3.151E-06  3.085E-07  3.217E-05
Strike Probability, 1/yr                1.115E-02  3.086E-07  2.863E+06
1.0E-5 1/yr design speed                     197.        60.         0.
1.0E-6 1/yr design speed                     233.        60.         0.
1.0E-7 1/yr design speed                     267.        95.         0.

   44  110    3.405E+03 1.0000      0      0      0

   44  111    3.405E+03 1.0000      0      0      0

   44  112    3.405E+03 1.0000      5      4      4
Point  1.110E-02  9.313E-04  1.323E-01  3.036E-07  2.548E-08  3.618E-06
Line   3.291E-01  1.241E-01  8.730E-01  3.411E-07  1.286E-07  9.046E-07
Strike Probability, 1/yr                6.447E-07  1.541E-07  4.523E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.       106.
1.0E-7 1/yr design speed                     111.        78.       151.

   44  113    3.405E+03 1.0000      1      1      1
Point  3.977E-04  0.000E+00  0.000E+00  2.176E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  2.073E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.290E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   44  114    3.405E+03 1.0000      0      0      0

   44  115    3.405E+03 1.0000      0      0      0

   44  116    3.405E+03 1.0000      7      7      7
Point  5.767E-02  1.183E-02  2.811E-01  2.209E-06  4.533E-07  1.076E-05
Line   3.232E+00  8.554E-01  1.221E+01  4.689E-06  1.241E-06  1.772E-05
Strike Probability, 1/yr                6.898E-06  1.694E-06  2.848E-05
1.0E-5 1/yr design speed                      60.        60.        98.
1.0E-6 1/yr design speed                     114.        80.       145.
1.0E-7 1/yr design speed                     156.       127.       185.
```

```
   44  117    3.405E+03 1.0000      4      2      2
Point  7.802E-03  3.384E-04  1.799E-01  1.707E-07  7.406E-09  3.937E-06
Line   6.135E-01  7.960E-02  4.729E+00  5.086E-07  6.599E-08  3.920E-06
Strike Probability, 1/yr                6.794E-07  7.340E-08  7.857E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.       119.
1.0E-7 1/yr design speed                     114.        50.       162.

   44  118    3.405E+03 1.0000      0      0      0

   44  119    3.405E+03 1.0000      0      0      0

   44  120    3.405E+03 1.0000      0      0      0

   44  121    3.405E+03 1.0000      4      4      4
Point  1.843E-02  1.327E-03  2.561E-01  4.034E-07  2.903E-08  5.606E-06
Line   6.135E-01  1.673E-01  2.250E+00  5.086E-07  1.387E-07  1.866E-06
Strike Probability, 1/yr                9.120E-07  1.677E-07  7.471E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.       117.
1.0E-7 1/yr design speed                     119.        80.       160.

   44  122    3.405E+03 1.0000      5      5      5
Point  1.273E-02  3.622E-03  4.472E-02  3.482E-07  9.909E-08  1.223E-06
Line   7.514E-01  3.491E-01  1.617E+00  7.787E-07  3.618E-07  1.676E-06
Strike Probability, 1/yr                1.127E-06  4.609E-07  2.899E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      70.        60.        98.
1.0E-7 1/yr design speed                     124.       103.       145.

   44  123    3.405E+03 1.0000      9      7      7
Point  1.357E-02  5.279E-03  3.489E-02  6.683E-07  2.600E-07  1.718E-06
Line   5.403E-01  3.046E-01  9.583E-01  1.008E-06  5.682E-07  1.788E-06
Strike Probability, 1/yr                1.676E-06  8.282E-07  3.506E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      81.        60.       102.
1.0E-7 1/yr design speed                     131.       113.       148.

   44  124    3.405E+02 0.1000      2      2      2
Point  1.440E-03  1.224E-04  1.694E-02  1.576E-07  1.339E-08  1.853E-06
Line   1.000E-01  0.000E+00  0.000E+00  4.145E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                5.721E-07  1.339E-08  1.853E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.        84.
1.0E-7 1/yr design speed                     110.        50.       133.

   45   67    1.339E+03 0.4000      2      2      2
Point  2.445E-01  3.517E-02  1.700E+00  6.808E-06  9.792E-07  4.733E-05
Line   6.152E+00  4.615E+00  8.200E+00  6.487E-06  4.866E-06  8.647E-06
Strike Probability, 1/yr                1.329E-05  5.846E-06  5.598E-05
1.0E-5 1/yr design speed                      76.        60.       108.
1.0E-6 1/yr design speed                     128.       115.       151.
1.0E-7 1/yr design speed                     166.       155.       188.
```

```
   45   68    3.346E+03 1.0000      6      6      6
Point  2.508E-01  2.103E-02  2.991E+00  8.379E-06  7.026E-07  9.993E-05
Line   6.212E+00  1.321E+00  2.921E+01  7.861E-06  1.672E-06  3.696E-05
Strike Probability, 1/yr                1.624E-05  2.375E-06  1.369E-04
1.0E-5 1/yr design speed                      81.        60.       127.
1.0E-6 1/yr design speed                     132.        93.       167.
1.0E-7 1/yr design speed                     169.       139.       202.

   45   69    3.346E+03 1.0000      7      5      5
Point  1.135E-02  2.834E-03  4.544E-02  4.423E-07  1.105E-07  1.771E-06
Line   2.980E-01  1.417E-01  6.268E-01  4.399E-07  2.091E-07  9.254E-07
Strike Probability, 1/yr                8.822E-07  3.196E-07  2.696E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        94.
1.0E-7 1/yr design speed                     120.       100.       140.

   45   70    2.343E+03 0.7000      1      1      1
Point  3.409E-03  0.000E+00  0.000E+00  2.712E-08  0.000E+00  0.000E+00
Line   3.000E-01  0.000E+00  0.000E+00  9.039E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.175E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      74.        50.        50.

   45   71    3.346E+02 0.1000      2      1      1
Point  3.750E-03  0.000E+00  0.000E+00  4.176E-07  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  8.436E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.261E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      76.        50.        50.
1.0E-7 1/yr design speed                     129.        50.        50.

   45   72    3.346E+01 0.0100      1      1      1
Point  8.523E-01  0.000E+00  0.000E+00  4.745E-04  0.000E+00  0.000E+00
Line   3.000E+00  0.000E+00  0.000E+00  6.327E-05  0.000E+00  0.000E+00
Strike Probability, 1/yr                5.378E-04  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     148.        50.        50.
1.0E-6 1/yr design speed                     185.        50.        50.
1.0E-7 1/yr design speed                     221.        50.        50.

   45   73    3.346E+01 0.0100      0      0      0

   45   74    3.346E+01 0.0100      0      0      0

   45   75    3.346E+03 1.0000      0      0      0

   45   76    3.346E+03 1.0000      0      0      0

   45   83    6.693E+02 0.2000     13     10     10
Point  6.889E-01  3.400E-02  1.396E+01  2.493E-04  1.231E-05  5.051E-03
Line   3.926E+00  9.403E-01  1.639E+01  5.382E-05  1.289E-05  2.247E-04
Strike Probability, 1/yr                3.031E-04  2.520E-05  5.276E-03
1.0E-5 1/yr design speed                     138.        92.       186.
1.0E-6 1/yr design speed                     177.       138.       223.
1.0E-7 1/yr design speed                     212.       174.       258.
```

```
   45   84    2.343E+03 0.7000     17     15     15
Point  8.927E-02  4.826E-02  1.651E-01  1.207E-05  6.525E-06  2.233E-05
Line   2.543E+00  1.710E+00  3.781E+00  1.302E-05  8.756E-06  1.937E-05
Strike Probability, 1/yr               2.509E-05  1.528E-05  4.170E-05
1.0E-5 1/yr design speed                     93.        80.       106.
1.0E-6 1/yr design speed                    140.       130.       150.
1.0E-7 1/yr design speed                    176.       167.       185.

   45   85    3.346E+02 0.1000      7      7      7
Point  3.785E-01  3.013E-02  4.756E+00  1.475E-04  1.174E-05  1.854E-03
Line   4.324E+00  7.655E-01  2.442E+01  6.384E-05  1.130E-05  3.606E-04
Strike Probability, 1/yr               2.114E-04  2.304E-05  2.214E-03
1.0E-5 1/yr design speed                    134.        90.       173.
1.0E-6 1/yr design speed                    172.       136.       209.
1.0E-7 1/yr design speed                    206.       173.       244.

   45   86    3.346E+02 0.1000      5      5      5
Point  9.376E-01  2.254E-02  3.901E+01  2.610E-04  6.275E-06  1.086E-02
Line   8.815E+00  8.576E-01  9.061E+01  9.296E-05  9.044E-06  9.555E-04
Strike Probability, 1/yr               3.540E-04  1.532E-05  1.181E-02
1.0E-5 1/yr design speed                    142.        80.       200.
1.0E-6 1/yr design speed                    180.       130.       235.
1.0E-7 1/yr design speed                    214.       167.       270.

   45   87    2.008E+03 0.6000     30     28     28
Point  1.914E+00  4.466E-01  8.202E+00  5.328E-04  1.243E-04  2.283E-03
Line   8.974E+00  4.298E+00  1.873E+01  9.463E-05  4.533E-05  1.976E-04
Strike Probability, 1/yr               6.274E-04  1.697E-04  2.481E-03
1.0E-5 1/yr design speed                    151.       128.       175.
1.0E-6 1/yr design speed                    188.       166.       211.
1.0E-7 1/yr design speed                    223.       201.       246.

   45   88    3.346E+03 1.0000     17     16     16
Point  1.400E+00  5.258E-01  3.729E+00  1.326E-04  4.977E-05  3.530E-04
Line   8.910E+00  4.985E+00  1.593E+01  3.195E-05  1.787E-05  5.710E-05
Strike Probability, 1/yr               1.645E-04  6.765E-05  4.101E-04
1.0E-5 1/yr design speed                    128.       110.       145.
1.0E-6 1/yr design speed                    167.       152.       183.
1.0E-7 1/yr design speed                    203.       187.       219.

   45   89    3.346E+03 1.0000     55     49     49
Point  1.286E+00  3.743E-01  4.415E+00  3.937E-04  1.146E-04  1.352E-03
Line   6.060E+00  3.259E+00  1.127E+01  7.029E-05  3.780E-05  1.307E-04
Strike Probability, 1/yr               4.640E-04  1.524E-04  1.483E-03
1.0E-5 1/yr design speed                    146.       126.       166.
1.0E-6 1/yr design speed                    183.       164.       203.
1.0E-7 1/yr design speed                    218.       199.       238.

   45   90    3.346E+03 1.0000     42     40     40
Point  2.943E+00  8.682E-01  9.977E+00  6.883E-04  2.030E-04  2.333E-03
Line   7.366E+00  4.256E+00  1.275E+01  6.525E-05  3.770E-05  1.129E-04
Strike Probability, 1/yr               7.535E-04  2.407E-04  2.446E-03
1.0E-5 1/yr design speed                    154.       136.       173.
1.0E-6 1/yr design speed                    189.       173.       208.
1.0E-7 1/yr design speed                    222.       206.       241.
```

```
   45   91    3.346E+03 1.0000     47     44     44
Point  2.079E+00  7.280E-01  5.938E+00  5.441E-04  1.905E-04  1.554E-03
Line   8.581E+00  4.853E+00  1.517E+01  8.506E-05  4.811E-05  1.504E-04
Strike Probability, 1/yr                6.292E-04  2.386E-04  1.704E-03
1.0E-5 1/yr design speed                     152.       137.       168.
1.0E-6 1/yr design speed                     188.       174.       204.
1.0E-7 1/yr design speed                     221.       207.       237.

   45   92    3.346E+03 1.0000     71     63     63
Point  6.340E-01  2.304E-01  1.745E+00  2.506E-04  9.109E-05  6.897E-04
Line   4.909E+00  2.759E+00  8.737E+00  7.351E-05  4.131E-05  1.308E-04
Strike Probability, 1/yr                3.242E-04  1.324E-04  8.205E-04
1.0E-5 1/yr design speed                     143.       129.       158.
1.0E-6 1/yr design speed                     181.       168.       195.
1.0E-7 1/yr design speed                     213.       201.       228.

   45   93    3.346E+03 1.0000     71     65     67
Point  3.171E+00  8.816E-01  1.140E+01  1.253E-03  3.485E-04  4.508E-03
Line   4.357E+00  2.852E+00  6.658E+00  6.525E-05  4.270E-05  9.970E-05
Strike Probability, 1/yr                1.319E-03  3.912E-04  4.607E-03
1.0E-5 1/yr design speed                     162.       143.       182.
1.0E-6 1/yr design speed                     197.       179.       217.
1.0E-7 1/yr design speed                     229.       211.       250.

   45   94    3.346E+03 1.0000     87     76     76
Point  3.817E-01  1.477E-01  9.865E-01  1.849E-04  7.156E-05  4.778E-04
Line   2.573E+00  1.601E+00  4.135E+00  4.721E-05  2.938E-05  7.586E-05
Strike Probability, 1/yr                2.321E-04  1.009E-04  5.537E-04
1.0E-5 1/yr design speed                     137.       123.       151.
1.0E-6 1/yr design speed                     175.       163.       188.
1.0E-7 1/yr design speed                     208.       197.       222.

   45   95    3.346E+03 1.0000     85     80     80
Point  6.199E-01  2.343E-01  1.640E+00  2.934E-04  1.109E-04  7.763E-04
Line   4.380E+00  2.660E+00  7.213E+00  7.853E-05  4.769E-05  1.293E-04
Strike Probability, 1/yr                3.719E-04  1.586E-04  9.056E-04
1.0E-5 1/yr design speed                     145.       132.       160.
1.0E-6 1/yr design speed                     182.       170.       196.
1.0E-7 1/yr design speed                     215.       203.       229.

   45   96    3.346E+03 1.0000     53     39     39
Point  1.468E-01  5.843E-02  3.690E-01  4.333E-05  1.724E-05  1.089E-04
Line   2.838E+00  1.702E+00  4.732E+00  3.172E-05  1.902E-05  5.289E-05
Strike Probability, 1/yr                7.505E-05  3.626E-05  1.618E-04
1.0E-5 1/yr design speed                     120.       106.       134.
1.0E-6 1/yr design speed                     162.       151.       173.
1.0E-7 1/yr design speed                     197.       186.       208.

   45   97    3.346E+03 1.0000     57     39     39
Point  1.012E-01  3.260E-02  3.140E-01  3.211E-05  1.035E-05  9.966E-05
Line   1.558E+00  9.369E-01  2.589E+00  1.872E-05  1.126E-05  3.113E-05
Strike Probability, 1/yr                5.083E-05  2.161E-05  1.308E-04
1.0E-5 1/yr design speed                     111.        92.       128.
1.0E-6 1/yr design speed                     154.       142.       168.
1.0E-7 1/yr design speed                     190.       179.       203.
```

```
   45   98    3.346E+03 1.0000    101     56     56
Point  8.453E-01  1.995E-01  3.582E+00  4.754E-04  1.122E-04  2.014E-03
Line   3.288E+00  1.852E+00  5.838E+00  7.003E-05  3.944E-05  1.243E-04
Strike Probability, 1/yr               5.454E-04  1.516E-04  2.139E-03
1.0E-5 1/yr design speed                    150.       130.       171.
1.0E-6 1/yr design speed                    186.       169.       206.
1.0E-7 1/yr design speed                    219.       202.       239.

   45   99    3.346E+03 1.0000     48     32     32
Point  5.611E-01  1.116E-01  2.821E+00  1.500E-04  2.983E-05  7.539E-04
Line   4.286E+00  1.882E+00  9.759E+00  4.339E-05  1.905E-05  9.880E-05
Strike Probability, 1/yr               1.933E-04  4.888E-05  8.527E-04
1.0E-5 1/yr design speed                    134.       110.       158.
1.0E-6 1/yr design speed                    173.       153.       194.
1.0E-7 1/yr design speed                    206.       188.       228.

   45  100    3.346E+03 1.0000     44     24     24
Point  8.811E-01  1.331E-01  5.834E+00  2.159E-04  3.260E-05  1.429E-03
Line   3.881E+00  1.836E+00  8.204E+00  3.601E-05  1.703E-05  7.613E-05
Strike Probability, 1/yr               2.519E-04  4.963E-05  1.505E-03
1.0E-5 1/yr design speed                    137.       110.       165.
1.0E-6 1/yr design speed                    175.       153.       201.
1.0E-7 1/yr design speed                    208.       188.       234.

   45  101    3.346E+03 1.0000     22     10     10
Point  3.549E-01  1.213E-02  1.038E+01  4.348E-05  1.486E-06  1.272E-03
Line   3.785E+00  7.295E-01  1.964E+01  1.756E-05  3.385E-06  9.113E-05
Strike Probability, 1/yr               6.104E-05  4.871E-06  1.363E-03
1.0E-5 1/yr design speed                    113.        60.       164.
1.0E-6 1/yr design speed                    156.       115.       200.
1.0E-7 1/yr design speed                    191.       158.       233.

   45  102    3.346E+03 1.0000     37     14     14
Point  1.072E-01  2.533E-02  4.535E-01  2.208E-05  5.219E-06  9.342E-05
Line   2.070E+00  8.653E-01  4.953E+00  1.616E-05  6.753E-06  3.865E-05
Strike Probability, 1/yr               3.824E-05  1.197E-05  1.321E-04
1.0E-5 1/yr design speed                    100.        70.       129.
1.0E-6 1/yr design speed                    144.       119.       170.
1.0E-7 1/yr design speed                    183.       159.       207.

   45  103    3.346E+03 1.0000     12      8      8
Point  1.779E-01  2.365E-02  1.338E+00  1.188E-05  1.580E-06  8.938E-05
Line   1.999E+00  1.044E+00  3.827E+00  5.059E-06  2.642E-06  9.685E-06
Strike Probability, 1/yr               1.694E-05  4.222E-06  9.907E-05
1.0E-5 1/yr design speed                     80.        60.       122.
1.0E-6 1/yr design speed                    129.       100.       164.
1.0E-7 1/yr design speed                    169.       142.       202.

   45  104    3.346E+03 1.0000      9      6      6
Point  1.638E-02  1.511E-03  1.775E-01  8.208E-07  7.573E-08  8.896E-06
Line   8.843E-01  2.126E-01  3.679E+00  1.679E-06  4.035E-07  6.983E-06
Strike Probability, 1/yr               2.499E-06  4.792E-07  1.588E-05
1.0E-5 1/yr design speed                     60.        60.        81.
1.0E-6 1/yr design speed                     91.        60.       133.
1.0E-7 1/yr design speed                    138.       104.       174.
```

```
   45  105    3.346E+03 1.0000     12     11     11
Point  6.044E-02  8.235E-03  4.436E-01  4.039E-06  5.502E-07  2.964E-05
Line   1.531E+00  5.468E-01  4.287E+00  3.875E-06  1.384E-06  1.085E-05
Strike Probability, 1/yr                7.913E-06  1.934E-06  4.049E-05
1.0E-5 1/yr design speed                      60.        60.       104.
1.0E-6 1/yr design speed                     115.        83.       150.
1.0E-7 1/yr design speed                     157.       129.       188.

   45  106    3.346E+03 1.0000      4      4      4
Point  1.508E-02  6.880E-04  3.304E-01  3.358E-07  1.532E-08  7.358E-06
Line   5.359E-01  1.277E-01  2.249E+00  4.521E-07  1.078E-07  1.897E-06
Strike Probability, 1/yr                7.879E-07  1.231E-07  9.255E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.       121.
1.0E-7 1/yr design speed                     116.        72.       163.

   45  107    3.346E+03 1.0000      8      5      5
Point  9.731E-03  1.390E-03  6.814E-02  4.334E-07  6.189E-08  3.035E-06
Line   1.083E+00  2.153E-01  5.448E+00  1.827E-06  3.632E-07  9.192E-06
Strike Probability, 1/yr                2.261E-06  4.251E-07  1.223E-05
1.0E-5 1/yr design speed                      60.        60.        74.
1.0E-6 1/yr design speed                      89.        60.       130.
1.0E-7 1/yr design speed                     137.       102.       172.

   45  108    3.346E+03 1.0000     17     13     13
Point  5.612E-02  8.994E-03  3.501E-01  5.312E-06  8.513E-07  3.314E-05
Line   1.415E+00  5.508E-01  3.633E+00  5.072E-06  1.975E-06  1.303E-05
Strike Probability, 1/yr                1.038E-05  2.826E-06  4.617E-05
1.0E-5 1/yr design speed                      66.        60.       107.
1.0E-6 1/yr design speed                     121.        92.       152.
1.0E-7 1/yr design speed                     162.       136.       191.

   45  109    3.346E+03 1.0000      1      1      1
Point  9.659E-04  0.000E+00  0.000E+00  5.378E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  2.109E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.647E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   45  110    3.346E+03 1.0000      1      1      1
Point  2.812E-02  0.000E+00  0.000E+00  1.566E-07  0.000E+00  0.000E+00
Line   1.500E+00  0.000E+00  0.000E+00  3.164E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                4.729E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     106.        50.        50.

   45  111    3.346E+03 1.0000      6      6      6
Point  2.325E-03  9.420E-04  5.741E-03  7.768E-08  3.147E-08  1.918E-07
Line   2.675E-01  1.226E-01  5.834E-01  3.385E-07  1.552E-07  7.382E-07
Strike Probability, 1/yr                4.162E-07  1.867E-07  9.300E-07
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        60.
1.0E-7 1/yr design speed                     104.        83.       125.
```

```
   45  112    3.346E+03 1.0000      4      2      2
Point  1.173E-02  2.503E-03  5.494E-02  2.612E-07  5.575E-08  1.224E-06
Line   1.373E+00  5.956E-02  3.166E+01  1.158E-06  5.024E-08  2.671E-05
Strike Probability, 1/yr                1.420E-06  1.060E-07  2.793E-05
1.0E-5 1/yr design speed                      60.        60.        99.
1.0E-6 1/yr design speed                      78.        60.       147.
1.0E-7 1/yr design speed                     129.        67.       186.

   45  113    3.346E+03 1.0000      7      5      5
Point  1.313E-02  2.053E-03  8.402E-02  5.119E-07  8.001E-08  3.275E-06
Line   7.192E-01  2.201E-01  2.349E+00  1.062E-06  3.250E-07  3.468E-06
Strike Probability, 1/yr                1.574E-06  4.050E-07  6.743E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      80.        60.       116.
1.0E-7 1/yr design speed                     130.       100.       160.

   45  114    3.346E+03 1.0000      0      0      0

   45  115    3.346E+03 1.0000      0      0      0

   45  116    3.346E+03 1.0000      3      3      3
Point  3.259E-02  1.437E-02  7.391E-02  5.443E-07  2.400E-07  1.235E-06
Line   6.645E-01  4.813E-01  9.174E-01  4.204E-07  3.045E-07  5.805E-07
Strike Probability, 1/yr                9.648E-07  5.445E-07  1.815E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        84.
1.0E-7 1/yr design speed                     119.       104.       135.

   45  117    3.346E+03 1.0000      1      1      1
Point  4.800E+00  0.000E+00  0.000E+00  2.673E-05  0.000E+00  0.000E+00
Line   9.600E+00  0.000E+00  0.000E+00  2.025E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.875E-05  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      92.        50.        50.
1.0E-6 1/yr design speed                     136.        50.        50.
1.0E-7 1/yr design speed                     176.        50.        50.

   45  118    3.346E+03 1.0000      4      4      4
Point  9.821E-03  8.739E-04  1.104E-01  2.187E-07  1.946E-08  2.458E-06
Line   2.531E+00  1.260E-01  5.082E+01  2.135E-06  1.063E-07  4.287E-05
Strike Probability, 1/yr                2.354E-06  1.258E-07  4.533E-05
1.0E-5 1/yr design speed                      60.        60.       110.
1.0E-6 1/yr design speed                      91.        60.       156.
1.0E-7 1/yr design speed                     139.        73.       194.

   45  119    3.346E+03 1.0000      2      2      2
Point  3.849E+00  3.388E-04  4.372E+04  4.286E-05  3.772E-09  4.869E-01
Line   7.601E+00  7.443E-01  7.761E+01  3.206E-06  3.140E-07  3.274E-05
Strike Probability, 1/yr                4.606E-05  3.177E-07  4.869E-01
1.0E-5 1/yr design speed                     102.        60.       260.
1.0E-6 1/yr design speed                     145.        60.       293.
1.0E-7 1/yr design speed                     183.        96.       325.
```

```
   45  120    3.346E+03 1.0000      1      1      1
Point  4.602E-01  0.000E+00  0.000E+00  2.563E-06  0.000E+00  0.000E+00
Line   4.050E+00  0.000E+00  0.000E+00  8.542E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                3.417E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      97.        50.        50.
1.0E-7 1/yr design speed                     141.        50.        50.

   45  121    3.346E+03 1.0000      0      0      0

   45  122    3.346E+03 1.0000     19     18     18
Point  4.626E-02  1.176E-02  1.820E-01  4.894E-06  1.244E-06  1.925E-05
Line   9.032E-01  4.327E-01  1.885E+00  3.619E-06  1.734E-06  7.554E-06
Strike Probability, 1/yr                8.513E-06  2.978E-06  2.680E-05
1.0E-5 1/yr design speed                      60.        60.        94.
1.0E-6 1/yr design speed                     116.        92.       142.
1.0E-7 1/yr design speed                     158.       136.       182.

   45  123    3.346E+03 1.0000     10     10     10
Point  5.966E-03  2.835E-03  1.256E-02  3.322E-07  1.578E-07  6.991E-07
Line   5.149E-01  3.337E-01  7.944E-01  1.086E-06  7.038E-07  1.675E-06
Strike Probability, 1/yr                1.418E-06  8.617E-07  2.374E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      77.        60.        93.
1.0E-7 1/yr design speed                     129.       115.       142.

   45  124    1.673E+02 0.0500      0      0      0


   46   67    6.573E+02 0.2000      5      5      5
Point  2.329E-01  1.226E-02  4.426E+00  3.301E-05  1.737E-06  6.273E-04
Line   2.412E+00  4.811E-01  1.209E+01  1.295E-05  2.583E-06  6.492E-05
Strike Probability, 1/yr                4.596E-05  4.320E-06  6.922E-04
1.0E-5 1/yr design speed                     104.        60.       153.
1.0E-6 1/yr design speed                     147.       106.       191.
1.0E-7 1/yr design speed                     184.       148.       227.

   46   68    3.286E+03 1.0000      9      8      8
Point  2.961E-01  6.879E-02  1.274E+00  1.511E-05  3.510E-06  6.502E-05
Line   6.774E+00  2.063E+00  2.224E+01  1.309E-05  3.988E-06  4.298E-05
Strike Probability, 1/yr                2.820E-05  7.498E-06  1.080E-04
1.0E-5 1/yr design speed                      96.        60.       125.
1.0E-6 1/yr design speed                     141.       116.       164.
1.0E-7 1/yr design speed                     178.       156.       199.

   46   69    3.286E+03 1.0000      0      0      0

   46   70    3.286E+02 0.1000      0      0      0

   46   83    1.643E+02 0.0500      1      1      1
Point  3.864E-02  0.000E+00  0.000E+00  4.381E-06  0.000E+00  0.000E+00
Line   1.700E+00  0.000E+00  0.000E+00  7.301E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.168E-05  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      72.        50.        50.
1.0E-6 1/yr design speed                     127.        50.        50.
1.0E-7 1/yr design speed                     165.        50.        50.
```

```
   46   84    9.859E+02 0.3000      3      1      1
Point  5.682E-04  0.000E+00  0.000E+00  3.221E-08  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  2.147E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.470E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      97.        50.        50.

   46   85    2.301E+03 0.7000      8      8      8
Point  1.443E+00  2.714E-02  7.676E+01  9.352E-05  1.758E-06  4.974E-03
Line   3.368E+00  7.782E-01  1.458E+01  8.266E-06  1.910E-06  3.578E-05
Strike Probability, 1/yr                1.018E-04  3.668E-06  5.009E-03
1.0E-5 1/yr design speed                     117.        60.       185.
1.0E-6 1/yr design speed                     158.       102.       222.
1.0E-7 1/yr design speed                     195.       144.       258.

   46   86    1.972E+03 0.6000      6      5      5
Point  1.375E+00  8.681E-03  2.179E+02  7.798E-05  4.921E-07  1.236E-02
Line   3.773E+00  5.870E-01  2.425E+01  8.102E-06  1.261E-06  5.207E-05
Strike Probability, 1/yr                8.608E-05  1.753E-06  1.241E-02
1.0E-5 1/yr design speed                     114.        60.       200.
1.0E-6 1/yr design speed                     155.        85.       236.
1.0E-7 1/yr design speed                     192.       134.       271.

   46   87    2.629E+03 0.8000      8      7      7
Point  2.350E-01  2.015E-02  2.742E+00  1.333E-05  1.142E-06  1.554E-04
Line   1.263E+00  4.700E-01  3.396E+00  2.713E-06  1.009E-06  7.293E-06
Strike Probability, 1/yr                1.604E-05  2.152E-06  1.627E-04
1.0E-5 1/yr design speed                      79.        60.       127.
1.0E-6 1/yr design speed                     127.        88.       167.
1.0E-7 1/yr design speed                     166.       135.       204.

   46   88    2.958E+03 0.9000      9      6      6
Point  2.295E-02  6.656E-03  7.912E-02  1.301E-06  3.774E-07  4.486E-06
Line   6.462E-01  2.579E-01  1.619E+00  1.388E-06  5.538E-07  3.478E-06
Strike Probability, 1/yr                2.689E-06  9.312E-07  7.964E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      95.        60.       119.
1.0E-7 1/yr design speed                     141.       121.       159.

   46   89    2.958E+03 0.9000     10      9      9
Point  2.280E+00  2.566E-01  2.026E+01  1.436E-04  1.616E-05  1.276E-03
Line   1.964E+01  6.071E+00  6.353E+01  4.686E-05  1.449E-05  1.516E-04
Strike Probability, 1/yr                1.905E-04  3.065E-05  1.428E-03
1.0E-5 1/yr design speed                     131.        97.       166.
1.0E-6 1/yr design speed                     170.       141.       202.
1.0E-7 1/yr design speed                     205.       177.       238.

   46   90    2.301E+03 0.7000     10     10     10
Point  8.932E-02  2.455E-02  3.250E-01  7.234E-06  1.988E-06  2.632E-05
Line   3.187E+00  9.883E-01  1.028E+01  9.778E-06  3.032E-06  3.154E-05
Strike Probability, 1/yr                1.701E-05  5.020E-06  5.786E-05
1.0E-5 1/yr design speed                      85.        60.       117.
1.0E-6 1/yr design speed                     139.       114.       160.
1.0E-7 1/yr design speed                     177.       157.       196.
```

```
   46   91    2.629E+03 0.8000     18     16     16
Point  2.352E+00  2.287E-01  2.418E+01  3.000E-04  2.917E-05  3.084E-03
Line   8.200E+00  2.665E+00  2.523E+01  3.962E-05  1.288E-05  1.219E-04
Strike Probability, 1/yr                3.396E-04  4.205E-05  3.206E-03
1.0E-5 1/yr design speed                     141.       105.       177.
1.0E-6 1/yr design speed                     179.       149.       212.
1.0E-7 1/yr design speed                     212.       185.       245.

   46   92    3.286E+03 1.0000     15     13     13
Point  5.551E+00  2.151E-01  1.432E+02  4.721E-04  1.829E-05  1.218E-02
Line   9.644E+00  2.460E+00  3.781E+01  3.107E-05  7.924E-06  1.218E-04
Strike Probability, 1/yr                5.031E-04  2.622E-05  1.230E-02
1.0E-5 1/yr design speed                     147.        94.       197.
1.0E-6 1/yr design speed                     183.       141.       231.
1.0E-7 1/yr design speed                     216.       178.       263.

   46   93    3.286E+03 1.0000     39     38     38
Point  1.550E+01  1.742E+00  1.380E+02  3.427E-03  3.851E-04  3.050E-02
Line   9.343E+00  4.021E+00  2.171E+01  7.825E-05  3.368E-05  1.818E-04
Strike Probability, 1/yr                3.506E-03  4.188E-04  3.069E-02
1.0E-5 1/yr design speed                     176.       143.       210.
1.0E-6 1/yr design speed                     210.       179.       244.
1.0E-7 1/yr design speed                     242.       211.       276.

   46   94    3.286E+03 1.0000     51     45     45
Point  1.397E+00  3.489E-01  5.596E+00  4.040E-04  1.009E-04  1.618E-03
Line   7.873E+00  3.679E+00  1.685E+01  8.623E-05  4.030E-05  1.845E-04
Strike Probability, 1/yr                4.902E-04  1.412E-04  1.803E-03
1.0E-5 1/yr design speed                     149.       129.       170.
1.0E-6 1/yr design speed                     185.       168.       205.
1.0E-7 1/yr design speed                     218.       201.       238.

   46   95    3.286E+03 1.0000     46     37     37
Point  1.204E+00  2.965E-01  4.890E+00  3.141E-04  7.734E-05  1.275E-03
Line   6.901E+00  3.396E+00  1.402E+01  6.817E-05  3.355E-05  1.385E-04
Strike Probability, 1/yr                3.822E-04  1.109E-04  1.414E-03
1.0E-5 1/yr design speed                     145.       125.       166.
1.0E-6 1/yr design speed                     182.       165.       201.
1.0E-7 1/yr design speed                     215.       198.       234.

   46   96    3.286E+03 1.0000     88     69     69
Point  1.641E+00  4.290E-01  6.276E+00  8.186E-04  2.140E-04  3.131E-03
Line   4.151E+00  2.405E+00  7.165E+00  7.845E-05  4.545E-05  1.354E-04
Strike Probability, 1/yr                8.971E-04  2.595E-04  3.267E-03
1.0E-5 1/yr design speed                     157.       138.       177.
1.0E-6 1/yr design speed                     192.       175.       212.
1.0E-7 1/yr design speed                     225.       207.       245.

   46   97    3.286E+03 1.0000     72     43     43
Point  3.051E-01  9.973E-02  9.333E-01  1.245E-04  4.071E-05  3.810E-04
Line   4.495E+00  2.436E+00  8.297E+00  6.951E-05  3.766E-05  1.283E-04
Strike Probability, 1/yr                1.940E-04  7.837E-05  5.093E-04
1.0E-5 1/yr design speed                     137.       122.       153.
1.0E-6 1/yr design speed                     176.       163.       189.
1.0E-7 1/yr design speed                     209.       197.       223.
```

```
   46   98    3.286E+03 1.0000     84     49     49
Point  9.566E-02  3.307E-02  2.767E-01  4.556E-05  1.575E-05  1.318E-04
Line   2.173E+00  1.172E+00  4.031E+00  3.920E-05  2.113E-05  7.271E-05
Strike Probability, 1/yr               8.475E-05  3.688E-05  2.045E-04
1.0E-5 1/yr design speed                    123.       107.       138.
1.0E-6 1/yr design speed                    164.       152.       178.
1.0E-7 1/yr design speed                    199.       187.       211.

   46   99    3.286E+03 1.0000     50     35     35
Point  3.337E-01  8.322E-02  1.338E+00  9.460E-05  2.359E-05  3.794E-04
Line   3.317E+00  1.602E+00  6.867E+00  3.562E-05  1.720E-05  7.374E-05
Strike Probability, 1/yr               1.302E-04  4.079E-05  4.531E-04
1.0E-5 1/yr design speed                    128.       107.       149.
1.0E-6 1/yr design speed                    167.       151.       186.
1.0E-7 1/yr design speed                    202.       186.       219.

   46  100    3.286E+03 1.0000     63     37     37
Point  2.578E-01  6.489E-02  1.024E+00  9.209E-05  2.318E-05  3.659E-04
Line   2.576E+00  1.392E+00  4.767E+00  3.485E-05  1.884E-05  6.449E-05
Strike Probability, 1/yr               1.269E-04  4.201E-05  4.304E-04
1.0E-5 1/yr design speed                    128.       108.       147.
1.0E-6 1/yr design speed                    167.       152.       185.
1.0E-7 1/yr design speed                    201.       187.       218.

   46  101    3.286E+03 1.0000     47     29     29
Point  7.625E-01  1.199E-01  4.848E+00  2.032E-04  3.196E-05  1.292E-03
Line   6.117E+00  2.414E+00  1.550E+01  6.174E-05  2.437E-05  1.565E-04
Strike Probability, 1/yr               2.649E-04  5.632E-05  1.448E-03
1.0E-5 1/yr design speed                    140.       114.       166.
1.0E-6 1/yr design speed                    178.       156.       202.
1.0E-7 1/yr design speed                    211.       191.       235.

   46  102    3.286E+03 1.0000     37     23     23
Point  7.132E-01  1.344E-01  3.785E+00  1.496E-04  2.819E-05  7.940E-04
Line   6.844E+00  2.831E+00  1.654E+01  5.438E-05  2.250E-05  1.314E-04
Strike Probability, 1/yr               2.040E-04  5.069E-05  9.254E-04
1.0E-5 1/yr design speed                    132.       102.       163.
1.0E-6 1/yr design speed                    172.       144.       201.
1.0E-7 1/yr design speed                    208.       181.       236.

   46  103    3.286E+03 1.0000     22     18     18
Point  3.148E-01  3.709E-02  2.671E+00  3.926E-05  4.627E-06  3.332E-04
Line   5.365E+00  1.458E+00  1.975E+01  2.535E-05  6.886E-06  9.331E-05
Strike Probability, 1/yr               6.461E-05  1.151E-05  4.265E-04
1.0E-5 1/yr design speed                    111.        69.       150.
1.0E-6 1/yr design speed                    153.       119.       189.
1.0E-7 1/yr design speed                    191.       159.       225.

   46  104    3.286E+03 1.0000     18     15     15
Point  1.973E+00  9.791E-02  3.975E+01  2.013E-04  9.991E-06  4.056E-03
Line   7.829E+00  1.805E+00  3.396E+01  3.026E-05  6.977E-06  1.313E-04
Strike Probability, 1/yr               2.316E-04  1.697E-05  4.187E-03
1.0E-5 1/yr design speed                    133.        79.       187.
1.0E-6 1/yr design speed                    173.       125.       224.
1.0E-7 1/yr design speed                    209.       164.       258.
```

```
   46  105    3.286E+03 1.0000      5      3      3
Point  9.514E-04  6.891E-04  1.313E-03  2.697E-08  1.953E-08  3.723E-08
Line   1.674E-01  1.213E-01  2.312E-01  1.798E-07  1.302E-07  2.482E-07
Strike Probability, 1/yr                2.068E-07  1.498E-07  2.855E-07
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        60.
1.0E-7 1/yr design speed                      87.        78.        99.

   46  106    3.286E+03 1.0000      9      8      8
Point  3.022E-03  8.576E-04  1.065E-02  1.542E-07  4.376E-08  5.432E-07
Line   2.349E-01  1.403E-01  3.934E-01  4.541E-07  2.712E-07  7.603E-07
Strike Probability, 1/yr                6.083E-07  3.150E-07  1.304E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        76.
1.0E-7 1/yr design speed                     112.        95.       130.

   46  107    3.286E+03 1.0000      4      4      4
Point  1.157E+00  5.244E-03  2.552E+02  2.623E-05  1.189E-07  5.787E-03
Line   7.228E+00  6.561E-01  7.963E+01  6.209E-06  5.636E-07  6.840E-05
Strike Probability, 1/yr                3.244E-05  6.825E-07  5.855E-03
1.0E-5 1/yr design speed                      95.        60.       193.
1.0E-6 1/yr design speed                     140.        60.       229.
1.0E-7 1/yr design speed                     179.       111.       263.

   46  108    3.286E+03 1.0000      5      4      4
Point  1.913E-03  8.138E-04  4.496E-03  5.422E-08  2.307E-08  1.274E-07
Line   1.244E-01  9.648E-02  1.604E-01  1.336E-07  1.036E-07  1.722E-07
Strike Probability, 1/yr                1.878E-07  1.267E-07  2.997E-07
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        60.
1.0E-7 1/yr design speed                      84.        73.        99.

   46  109    3.286E+03 1.0000     12     10     10
Point  3.572E-02  9.502E-03  1.343E-01  2.430E-06  6.465E-07  9.135E-06
Line   2.369E+00  1.048E+00  5.358E+00  6.106E-06  2.700E-06  1.381E-05
Strike Probability, 1/yr                8.536E-06  3.346E-06  2.294E-05
1.0E-5 1/yr design speed                      60.        60.        92.
1.0E-6 1/yr design speed                     118.        96.       141.
1.0E-7 1/yr design speed                     160.       140.       181.

   46  110    3.286E+03 1.0000      4      1      1
Point  2.614E-02  0.000E+00  0.000E+00  5.927E-07  0.000E+00  0.000E+00
Line   2.000E+00  0.000E+00  0.000E+00  1.718E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.311E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      90.        50.        50.
1.0E-7 1/yr design speed                     137.        50.        50.

   46  111    3.286E+03 1.0000      2      2      2
Point  3.486E-03  4.523E-04  2.687E-02  3.953E-08  5.128E-09  3.046E-07
Line   1.373E+00  5.956E-02  3.166E+01  5.898E-07  2.558E-08  1.360E-05
Strike Probability, 1/yr                6.293E-07  3.071E-08  1.390E-05
1.0E-5 1/yr design speed                      60.        50.        79.
1.0E-6 1/yr design speed                      60.        50.       134.
1.0E-7 1/yr design speed                     113.        50.       175.
```

```
   46  112    3.286E+03 1.0000      7      6      6
Point  1.335E-02  2.396E-03  7.438E-02  5.298E-07  9.510E-08  2.952E-06
Line   3.937E-01  1.785E-01  8.681E-01  5.918E-07  2.684E-07  1.305E-06
Strike Probability, 1/yr                1.122E-06  3.635E-07  4.257E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      69.        60.       105.
1.0E-7 1/yr design speed                     123.        98.       151.

   46  113    3.286E+03 1.0000      1      1      1
Point  2.614E-02  0.000E+00  0.000E+00  1.482E-07  0.000E+00  0.000E+00
Line   2.000E+00  0.000E+00  0.000E+00  4.295E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                5.777E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     110.        50.        50.

   46  114    3.286E+03 1.0000      4      3      3
Point  4.411E-03  7.176E-04  2.712E-02  1.000E-07  1.627E-08  6.149E-07
Line   7.764E-01  1.263E-01  4.772E+00  6.669E-07  1.085E-07  4.099E-06
Strike Probability, 1/yr                7.669E-07  1.248E-07  4.714E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.       110.
1.0E-7 1/yr design speed                     117.        73.       156.

   46  115    3.286E+03 1.0000      0      0      0

   46  116    3.286E+03 1.0000      6      5      5
Point  7.195E-02  4.697E-03  1.102E+00  2.448E-06  1.598E-07  3.749E-05
Line   3.311E+00  3.648E-01  3.005E+01  4.266E-06  4.700E-07  3.873E-05
Strike Probability, 1/yr                6.714E-06  6.298E-07  7.622E-05
1.0E-5 1/yr design speed                      60.        60.       119.
1.0E-6 1/yr design speed                     113.        60.       162.
1.0E-7 1/yr design speed                     156.       109.       200.

   46  117    3.286E+03 1.0000      4      3      3
Point  1.336E-02  5.669E-03  3.149E-02  3.030E-07  1.286E-07  7.140E-07
Line   8.372E-01  6.064E-01  1.156E+00  7.192E-07  5.209E-07  9.929E-07
Strike Probability, 1/yr                1.022E-06  6.495E-07  1.707E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      66.        60.        84.
1.0E-7 1/yr design speed                     122.       110.       135.

   46  118    3.286E+03 1.0000      7      6      6
Point  3.243E-01  9.509E-03  1.106E+01  1.287E-05  3.774E-07  4.390E-04
Line   9.419E+00  6.834E-01  1.298E+02  1.416E-05  1.027E-06  1.951E-04
Strike Probability, 1/yr                2.703E-05  1.405E-06  6.342E-04
1.0E-5 1/yr design speed                      93.        60.       158.
1.0E-6 1/yr design speed                     139.        76.       196.
1.0E-7 1/yr design speed                     178.       124.       231.

   46  119    3.286E+03 1.0000      3      3      3
Point  2.236E-01  1.692E-02  2.953E+00  3.802E-06  2.878E-07  5.023E-05
Line   3.954E+00  6.304E-01  2.480E+01  2.547E-06  4.061E-07  1.597E-05
Strike Probability, 1/yr                6.349E-06  6.940E-07  6.620E-05
1.0E-5 1/yr design speed                      60.        60.       114.
1.0E-6 1/yr design speed                     110.        60.       158.
1.0E-7 1/yr design speed                     153.       109.       196.
```

```
   46  120    3.286E+03 1.0000      4      3      3
Point  1.109E-02  7.305E-03  1.683E-02  2.515E-07  1.657E-07  3.817E-07
Line   7.798E-01  3.293E-01  1.847E+00  6.699E-07  2.828E-07  1.586E-06
Strike Probability, 1/yr                9.213E-07  4.485E-07  1.968E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        88.
1.0E-7 1/yr design speed                     120.       101.       139.

   46  121    3.286E+03 1.0000      0      0      0

   46  122    3.286E+03 1.0000      5      3      3
Point  1.073E-02  3.709E-03  3.106E-02  3.042E-07  1.051E-07  8.804E-07
Line   7.459E-01  2.853E-01  1.950E+00  8.009E-07  3.064E-07  2.094E-06
Strike Probability, 1/yr                1.105E-06  4.115E-07  2.974E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      69.        60.        99.
1.0E-7 1/yr design speed                     124.       100.       147.

   46  123    3.286E+03 1.0000      7      7      7
Point  1.161E-02  2.321E-03  5.806E-02  4.607E-07  9.211E-08  2.304E-06
Line   3.748E-01  1.812E-01  7.753E-01  5.634E-07  2.724E-07  1.165E-06
Strike Probability, 1/yr                1.024E-06  3.645E-07  3.470E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      66.        60.       101.
1.0E-7 1/yr design speed                     121.        98.       147.

   46  124    1.643E+02 0.0500      1      1      1
Point  2.557E-03  0.000E+00  0.000E+00  2.899E-07  0.000E+00  0.000E+00
Line   3.000E-01  0.000E+00  0.000E+00  1.288E-06  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.578E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      80.        50.        50.
1.0E-7 1/yr design speed                     131.        50.        50.

   47   67    1.613E+02 0.0500      0      0      0

   47   68    6.451E+02 0.2000      6      6      6
Point  6.121E-01  5.068E-03  7.392E+01  1.061E-04  8.782E-07  1.281E-02
Line   6.740E+00  5.873E-01  7.735E+01  4.425E-05  3.855E-06  5.078E-04
Strike Probability, 1/yr                1.503E-04  4.734E-06  1.332E-02
1.0E-5 1/yr design speed                     128.        60.       201.
1.0E-6 1/yr design speed                     166.       110.       237.
1.0E-7 1/yr design speed                     202.       152.       272.

   47   69    6.451E+02 0.2000      0      0      0

   47   87    1.613E+02 0.0500      0      0      0

   47   88    3.226E+02 0.1000      3      3      3
Point  5.473E-02  1.352E-03  2.215E+00  9.484E-06  2.343E-07  3.839E-04
Line   2.880E+00  2.115E-01  3.921E+01  1.890E-05  1.388E-06  2.574E-04
Strike Probability, 1/yr                2.839E-05  1.623E-06  6.412E-04
1.0E-5 1/yr design speed                      99.        60.       156.
1.0E-6 1/yr design speed                     143.        84.       191.
1.0E-7 1/yr design speed                     179.       134.       224.

   47   89    1.613E+02 0.0500      0      0      0
```

```
   47   90    1.290E+03 0.4000      2      2      2
Point  3.264E-02  4.810E-04  2.215E+00  9.428E-07  1.389E-08  6.398E-05
Line   6.182E-01  1.859E-01  2.056E+00  6.763E-07  2.034E-07  2.249E-06
Strike Probability, 1/yr                1.619E-06  2.173E-07  6.623E-05
1.0E-5 1/yr design speed                      60.        60.       110.
1.0E-6 1/yr design speed                      82.        60.       151.
1.0E-7 1/yr design speed                     135.        99.       188.

   47   91    2.580E+03 0.8000     11      9      9
Point  1.195E+00  9.917E-02  1.441E+01  9.495E-05  7.877E-06  1.145E-03
Line   6.274E+00  2.002E+00  1.966E+01  1.887E-05  6.023E-06  5.915E-05
Strike Probability, 1/yr                1.138E-04  1.390E-05  1.204E-03
1.0E-5 1/yr design speed                     123.        78.       162.
1.0E-6 1/yr design speed                     163.       132.       198.
1.0E-7 1/yr design speed                     198.       171.       231.

   47   92    3.226E+03 1.0000     18     15     15
Point  5.430E+00  6.158E-01  4.787E+01  5.646E-04  6.403E-05  4.978E-03
Line   8.284E+00  3.388E+00  2.026E+01  3.263E-05  1.334E-05  7.978E-05
Strike Probability, 1/yr                5.972E-04  7.738E-05  5.057E-03
1.0E-5 1/yr design speed                     149.       115.       183.
1.0E-6 1/yr design speed                     185.       156.       218.
1.0E-7 1/yr design speed                     218.       190.       251.

   47   93    3.226E+03 1.0000     11     11     11
Point  3.692E-01  2.845E-02  4.793E+00  2.346E-05  1.807E-06  3.045E-04
Line   1.191E+00  5.275E-01  2.690E+00  2.867E-06  1.270E-06  6.475E-06
Strike Probability, 1/yr                2.633E-05  3.077E-06  3.110E-04
1.0E-5 1/yr design speed                      92.        60.       138.
1.0E-6 1/yr design speed                     137.       100.       176.
1.0E-7 1/yr design speed                     175.       146.       211.

   47   94    3.226E+03 1.0000     20     18     18
Point  5.894E-01  7.418E-02  4.683E+00  6.809E-05  8.570E-06  5.410E-04
Line   2.273E+00  1.016E+00  5.081E+00  9.946E-06  4.448E-06  2.224E-05
Strike Probability, 1/yr                7.804E-05  1.302E-05  5.633E-04
1.0E-5 1/yr design speed                     115.        76.       149.
1.0E-6 1/yr design speed                     156.       129.       186.
1.0E-7 1/yr design speed                     191.       168.       220.

   47   95    3.226E+03 1.0000     50     46     46
Point  1.114E-01  4.401E-02  2.822E-01  3.219E-05  1.271E-05  8.151E-05
Line   1.830E+00  1.118E+00  2.997E+00  2.002E-05  1.223E-05  3.279E-05
Strike Probability, 1/yr                5.221E-05  2.494E-05  1.143E-04
1.0E-5 1/yr design speed                     111.        96.       126.
1.0E-6 1/yr design speed                     155.       144.       167.
1.0E-7 1/yr design speed                     191.       181.       202.

   47   96    3.226E+03 1.0000     59     50     50
Point  1.105E-01  4.732E-02  2.580E-01  3.766E-05  1.613E-05  8.792E-05
Line   1.694E+00  1.073E+00  2.674E+00  2.186E-05  1.385E-05  3.452E-05
Strike Probability, 1/yr                5.952E-05  2.997E-05  1.224E-04
1.0E-5 1/yr design speed                     114.       101.       127.
1.0E-6 1/yr design speed                     157.       146.       168.
1.0E-7 1/yr design speed                     192.       183.       203.
```

```
   47   97    3.226E+03 1.0000     73     53     53
Point  3.856E-02  1.904E-02  7.808E-02  1.626E-05  8.029E-06  3.292E-05
Line   1.132E+00  7.463E-01  1.717E+00  1.808E-05  1.192E-05  2.743E-05
Strike Probability, 1/yr               3.434E-05  1.995E-05  6.035E-05
1.0E-5 1/yr design speed                    104.        91.       116.
1.0E-6 1/yr design speed                    151.       141.       159.
1.0E-7 1/yr design speed                    187.       179.       196.

   47   98    3.226E+03 1.0000     67     55     55
Point  3.667E-02  1.895E-02  7.098E-02  1.419E-05  7.333E-06  2.747E-05
Line   9.624E-01  6.925E-01  1.338E+00  1.411E-05  1.015E-05  1.961E-05
Strike Probability, 1/yr               2.830E-05  1.749E-05  4.708E-05
1.0E-5 1/yr design speed                    100.        86.       110.
1.0E-6 1/yr design speed                    147.       139.       155.
1.0E-7 1/yr design speed                    184.       177.       191.

   47   99    3.226E+03 1.0000     51     33     33
Point  6.278E-01  1.328E-01  2.969E+00  1.850E-04  3.911E-05  8.747E-04
Line   3.066E+00  1.666E+00  5.643E+00  3.422E-05  1.859E-05  6.297E-05
Strike Probability, 1/yr               2.192E-04  5.770E-05  9.376E-04
1.0E-5 1/yr design speed                    135.       112.       158.
1.0E-6 1/yr design speed                    173.       155.       194.
1.0E-7 1/yr design speed                    207.       189.       228.

   47  100    3.226E+03 1.0000     56     40     40
Point  2.981E-01  8.771E-02  1.013E+00  9.643E-05  2.837E-05  3.278E-04
Line   4.829E+00  2.383E+00  9.783E+00  5.917E-05  2.921E-05  1.199E-04
Strike Probability, 1/yr               1.556E-04  5.758E-05  4.476E-04
1.0E-5 1/yr design speed                    133.       116.       151.
1.0E-6 1/yr design speed                    173.       158.       188.
1.0E-7 1/yr design speed                    206.       193.       221.

   47  101    3.226E+03 1.0000     45     29     29
Point  1.902E-01  4.765E-02  7.590E-01  4.944E-05  1.239E-05  1.973E-04
Line   3.848E+00  1.662E+00  8.908E+00  3.789E-05  1.636E-05  8.771E-05
Strike Probability, 1/yr               8.732E-05  2.875E-05  2.850E-04
1.0E-5 1/yr design speed                    123.       101.       144.
1.0E-6 1/yr design speed                    164.       148.       182.
1.0E-7 1/yr design speed                    199.       184.       215.

   47  102    3.226E+03 1.0000     26     10     10
Point  2.295E-03  1.489E-03  3.537E-03  3.447E-07  2.236E-07  5.312E-07
Line   2.483E-01  1.760E-01  3.502E-01  1.412E-06  1.001E-06  1.992E-06
Strike Probability, 1/yr               1.757E-06  1.225E-06  2.524E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     83.        72.        95.
1.0E-7 1/yr design speed                    133.       122.       144.

   47  103    3.226E+03 1.0000     13      9      9
Point  4.602E-01  3.092E-02  6.848E+00  3.456E-05  2.322E-06  5.143E-04
Line   5.372E+00  1.399E+00  2.063E+01  1.528E-05  3.979E-06  5.867E-05
Strike Probability, 1/yr               4.984E-05  6.302E-06  5.729E-04
1.0E-5 1/yr design speed                    105.        60.       154.
1.0E-6 1/yr design speed                    148.       108.       193.
1.0E-7 1/yr design speed                    186.       149.       229.
```

```
   47  104    3.226E+03 1.0000     23     18     18
Point  1.819E+00  8.318E-02  3.980E+01  2.417E-04  1.105E-05  5.287E-03
Line   4.466E+00  1.295E+00  1.540E+01  2.247E-05  6.517E-06  7.750E-05
Strike Probability, 1/yr                2.642E-04  1.757E-05  5.365E-03
1.0E-5 1/yr design speed                     135.        79.       191.
1.0E-6 1/yr design speed                     175.       125.       227.
1.0E-7 1/yr design speed                     211.       164.       261.

   47  105    3.226E+03 1.0000      9      7      7
Point  1.169E+02  4.089E-02  3.339E+05  6.075E-03  2.126E-06  1.736E+01
Line   5.867E+00  6.105E-01  5.638E+01  1.155E-05  1.202E-06  1.110E-04
Strike Probability, 1/yr                6.086E-03  3.328E-06  1.736E+01
1.0E-5 1/yr design speed                     187.        60.       310.
1.0E-6 1/yr design speed                     223.        93.       342.
1.0E-7 1/yr design speed                     258.       136.       372.

   47  106    3.226E+03 1.0000      9      6      6
Point  3.231E-01  2.022E-02  5.165E+00  1.680E-05  1.051E-06  2.685E-04
Line   4.658E+00  7.033E-01  3.085E+01  9.173E-06  1.385E-06  6.076E-05
Strike Probability, 1/yr                2.597E-05  2.436E-06  3.293E-04
1.0E-5 1/yr design speed                      91.        60.       145.
1.0E-6 1/yr design speed                     137.        87.       185.
1.0E-7 1/yr design speed                     176.       132.       221.

   47  107    3.226E+03 1.0000     10      9      9
Point  2.918E-01  2.723E-02  3.127E+00  1.686E-05  1.573E-06  1.806E-04
Line   5.077E+00  9.843E-01  2.618E+01  1.111E-05  2.154E-06  5.729E-05
Strike Probability, 1/yr                2.796E-05  3.727E-06  2.379E-04
1.0E-5 1/yr design speed                      93.        60.       139.
1.0E-6 1/yr design speed                     138.        97.       180.
1.0E-7 1/yr design speed                     178.       140.       216.

   47  108    3.226E+03 1.0000      7      6      6
Point  2.529E-02  2.735E-03  2.338E-01  1.022E-06  1.106E-07  9.452E-06
Line   1.340E+00  3.341E-01  5.377E+00  2.053E-06  5.117E-07  8.236E-06
Strike Probability, 1/yr                3.075E-06  6.223E-07  1.769E-05
1.0E-5 1/yr design speed                      60.        60.        84.
1.0E-6 1/yr design speed                      96.        60.       135.
1.0E-7 1/yr design speed                     142.       109.       176.

   47  109    3.226E+03 1.0000     19     18     18
Point  3.865E-01  5.861E-02  2.548E+00  4.241E-05  6.432E-06  2.797E-04
Line   3.452E+00  1.378E+00  8.646E+00  1.435E-05  5.728E-06  3.595E-05
Strike Probability, 1/yr                5.676E-05  1.216E-05  3.156E-04
1.0E-5 1/yr design speed                     107.        71.       144.
1.0E-6 1/yr design speed                     150.       119.       183.
1.0E-7 1/yr design speed                     188.       159.       220.

   47  110    3.226E+03 1.0000     17     14     14
Point  5.415E-02  1.351E-02  2.170E-01  5.318E-06  1.327E-06  2.131E-05
Line   1.271E+00  6.259E-01  2.580E+00  4.727E-06  2.328E-06  9.598E-06
Strike Probability, 1/yr                1.004E-05  3.655E-06  3.091E-05
1.0E-5 1/yr design speed                      65.        60.        98.
1.0E-6 1/yr design speed                     120.        97.       145.
1.0E-7 1/yr design speed                     161.       140.       184.
```

```
   47  111    3.226E+03 1.0000     15      8      8
Point  4.414E-01  2.565E-02  7.594E+00  3.824E-05  2.223E-06  6.580E-04
Line   2.587E+00  6.455E-01  1.037E+01  8.492E-06  2.119E-06  3.403E-05
Strike Probability, 1/yr               4.673E-05  4.341E-06  6.920E-04
1.0E-5 1/yr design speed                    103.        60.       157.
1.0E-6 1/yr design speed                    146.       100.       196.
1.0E-7 1/yr design speed                    184.       142.       231.

   47  112    3.226E+03 1.0000      3      2      2
Point  2.543E-02  2.245E-02  2.880E-02  4.406E-07  3.890E-07  4.991E-07
Line   1.151E+00  7.845E-01  1.688E+00  7.555E-07  5.150E-07  1.108E-06
Strike Probability, 1/yr               1.196E-06  9.040E-07  1.607E-06
1.0E-5 1/yr design speed                     60.        60.        60.
1.0E-6 1/yr design speed                     72.        60.        82.
1.0E-7 1/yr design speed                    125.       114.       135.

   47  113    3.226E+03 1.0000      0      0      0

   47  114    3.226E+03 1.0000      1      1      1
Point  3.977E-04  0.000E+00  0.000E+00  2.297E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  2.188E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr               2.418E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                     50.        50.        50.
1.0E-6 1/yr design speed                     50.        50.        50.
1.0E-7 1/yr design speed                     50.        50.        50.

   47  115    3.226E+03 1.0000      1      0      0

   47  116    3.226E+03 1.0000      2      2      2
Point  4.060E-01  3.262E-05  5.052E+03  4.690E-06  3.768E-10  5.837E-02
Line   4.789E+00  3.233E-02  7.096E+02  2.096E-06  1.415E-08  3.105E-04
Strike Probability, 1/yr               6.786E-06  1.452E-08  5.868E-02
1.0E-5 1/yr design speed                     60.        50.       229.
1.0E-6 1/yr design speed                    111.        50.       263.
1.0E-7 1/yr design speed                    154.        50.       295.

   47  117    3.226E+03 1.0000     10      7      8
Point  2.996E-02  1.281E-02  7.008E-02  1.731E-06  7.401E-07  4.048E-06
Line   1.260E+00  5.293E-01  2.998E+00  2.756E-06  1.158E-06  6.559E-06
Strike Probability, 1/yr               4.487E-06  1.898E-06  1.061E-05
1.0E-5 1/yr design speed                     60.        60.        68.
1.0E-6 1/yr design speed                    105.        82.       127.
1.0E-7 1/yr design speed                    149.       128.       168.

   47  118    3.226E+03 1.0000      6      2      2
Point  3.279E-01  2.171E-03  4.951E+01  1.136E-05  7.525E-08  1.716E-03
Line   7.952E+00  4.503E-01  1.404E+02  1.044E-05  5.911E-07  1.844E-04
Strike Probability, 1/yr               2.180E-05  6.664E-07  1.900E-03
1.0E-5 1/yr design speed                     87.        60.       175.
1.0E-6 1/yr design speed                    135.        60.       212.
1.0E-7 1/yr design speed                    174.       111.       247.
```

```
   47  119    3.226E+03 1.0000      3      0      1
Point  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  6.564E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                6.564E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   47  120    3.226E+03 1.0000      1      1      1
Point  5.682E-04  0.000E+00  0.000E+00  3.282E-09  0.000E+00  0.000E+00
Line   1.000E-01  0.000E+00  0.000E+00  2.188E-08  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.516E-08  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      50.        50.        50.
1.0E-6 1/yr design speed                      50.        50.        50.
1.0E-7 1/yr design speed                      50.        50.        50.

   47  121    3.226E+03 1.0000      1      1      1
Point  1.705E-01  0.000E+00  0.000E+00  9.846E-07  0.000E+00  0.000E+00
Line   3.000E+00  0.000E+00  0.000E+00  6.564E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.641E-06  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      80.        50.        50.
1.0E-7 1/yr design speed                     129.        50.        50.

   47  122    2.903E+03 0.9000     12      8      9
Point  1.171E-01  2.752E-02  4.986E-01  9.023E-06  2.120E-06  3.840E-05
Line   1.703E+00  9.247E-01  3.137E+00  4.969E-06  2.698E-06  9.151E-06
Strike Probability, 1/yr                1.399E-05  4.817E-06  4.755E-05
1.0E-5 1/yr design speed                      76.        60.       107.
1.0E-6 1/yr design speed                     126.       102.       152.
1.0E-7 1/yr design speed                     166.       144.       191.

   47  123    3.226E+03 1.0000      1      1      1
Point  5.682E-03  0.000E+00  0.000E+00  3.282E-08  0.000E+00  0.000E+00
Line   5.000E-01  0.000E+00  0.000E+00  1.094E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.422E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      77.        50.        50.

   47  124    9.677E+02 0.3000      0      0      0

   48   89    1.582E+02 0.0500      0      0      0

   48   90    3.164E+02 0.1000      0      0      0

   48   91    6.327E+02 0.2000      4      4      4
Point  1.773E+00  2.769E-02  1.135E+02  2.088E-04  3.262E-06  1.337E-02
Line   9.835E+00  1.615E+00  5.989E+01  4.388E-05  7.205E-06  2.672E-04
Strike Probability, 1/yr                2.527E-04  1.047E-05  1.363E-02
1.0E-5 1/yr design speed                     138.        68.       199.
1.0E-6 1/yr design speed                     176.       131.       232.
1.0E-7 1/yr design speed                     209.       171.       265.
```

```
   48   92    1.265E+03 0.4000      3      3      3
Point  6.778E-01  1.309E-04  3.509E+03  2.994E-05  5.784E-09  1.550E-01
Line   1.448E+00  7.936E-02  2.642E+01  2.423E-06  1.328E-07  4.420E-05
Strike Probability, 1/yr                3.236E-05  1.386E-07  1.550E-01
1.0E-5 1/yr design speed                      96.        60.       234.
1.0E-6 1/yr design speed                     139.        60.       266.
1.0E-7 1/yr design speed                     177.        83.       298.

   48   93    1.898E+03 0.6000      6      4      4
Point  9.697E+00  3.412E-03  2.756E+04  5.711E-04  2.010E-07  1.623E+00
Line   1.827E+01  7.374E-01  4.527E+02  4.076E-05  1.645E-06  1.010E-03
Strike Probability, 1/yr                6.119E-04  1.846E-06  1.624E+00
1.0E-5 1/yr design speed                     150.        60.       267.
1.0E-6 1/yr design speed                     186.        92.       299.
1.0E-7 1/yr design speed                     219.       144.       329.

   48   94    2.531E+03 0.8000      7      6      6
Point  7.001E-01  6.006E-03  8.163E+01  3.608E-05  3.095E-07  4.206E-03
Line   2.117E+00  4.460E-01  1.004E+01  4.132E-06  8.707E-07  1.961E-05
Strike Probability, 1/yr                4.021E-05  1.180E-06  4.226E-03
1.0E-5 1/yr design speed                     101.        60.       180.
1.0E-6 1/yr design speed                     144.        75.       215.
1.0E-7 1/yr design speed                     181.       134.       248.

   48   95    3.164E+03 1.0000     15     15     15
Point  9.473E-02  1.402E-02  6.399E-01  8.369E-06  1.239E-06  5.654E-05
Line   8.740E-01  4.198E-01  1.819E+00  2.925E-06  1.405E-06  6.088E-06
Strike Probability, 1/yr                1.129E-05  2.644E-06  6.262E-05
1.0E-5 1/yr design speed                      70.        60.       110.
1.0E-6 1/yr design speed                     125.        98.       152.
1.0E-7 1/yr design speed                     165.       145.       189.

   48   96    3.164E+03 1.0000     34     33     33
Point  1.128E-01  3.473E-02  3.663E-01  2.258E-05  6.954E-06  7.334E-05
Line   1.704E+00  9.312E-01  3.116E+00  1.292E-05  7.063E-06  2.364E-05
Strike Probability, 1/yr                3.551E-05  1.402E-05  9.698E-05
1.0E-5 1/yr design speed                     103.        79.       122.
1.0E-6 1/yr design speed                     148.       133.       163.
1.0E-7 1/yr design speed                     185.       172.       199.

   48   97    3.164E+03 1.0000     45     34     34
Point  6.035E-02  2.268E-02  1.606E-01  1.599E-05  6.012E-06  4.255E-05
Line   9.328E-01  5.940E-01  1.465E+00  9.364E-06  5.963E-06  1.470E-05
Strike Probability, 1/yr                2.536E-05  1.198E-05  5.726E-05
1.0E-5 1/yr design speed                      94.        74.       111.
1.0E-6 1/yr design speed                     142.       130.       155.
1.0E-7 1/yr design speed                     180.       170.       191.

   48   98    3.164E+03 1.0000     60     44     44
Point  3.392E-02  1.530E-02  7.518E-02  1.198E-05  5.406E-06  2.657E-05
Line   9.740E-01  6.269E-01  1.513E+00  1.304E-05  8.392E-06  2.025E-05
Strike Probability, 1/yr                2.502E-05  1.380E-05  4.682E-05
1.0E-5 1/yr design speed                      96.        79.       110.
1.0E-6 1/yr design speed                     145.       135.       155.
1.0E-7 1/yr design speed                     182.       174.       191.
```

```
   48   99    3.164E+03 1.0000     52     32     32
Point  2.184E-02  9.757E-03  4.888E-02  6.688E-06  2.988E-06  1.497E-05
Line   6.766E-01  4.250E-01  1.077E+00  7.848E-06  4.930E-06  1.249E-05
Strike Probability, 1/yr               1.454E-05  7.918E-06  2.746E-05
1.0E-5 1/yr design speed                     80.        60.        98.
1.0E-6 1/yr design speed                    135.       125.       146.
1.0E-7 1/yr design speed                    174.       165.       184.

   48  100    3.164E+03 1.0000     36     30     30
Point  3.710E-01  8.076E-02  1.705E+00  7.867E-05  1.712E-05  3.615E-04
Line   3.140E+00  1.640E+00  6.013E+00  2.522E-05  1.317E-05  4.829E-05
Strike Probability, 1/yr               1.039E-04  3.029E-05  4.097E-04
1.0E-5 1/yr design speed                    123.       100.       146.
1.0E-6 1/yr design speed                    163.       146.       183.
1.0E-7 1/yr design speed                    198.       182.       217.

   48  101    3.164E+03 1.0000     77     60     60
Point  4.008E-02  1.902E-02  8.445E-02  1.817E-05  8.625E-06  3.830E-05
Line   1.541E+00  9.581E-01  2.480E+00  2.648E-05  1.646E-05  4.259E-05
Strike Probability, 1/yr               4.465E-05  2.508E-05  8.089E-05
1.0E-5 1/yr design speed                    111.        99.       124.
1.0E-6 1/yr design speed                    156.       147.       166.
1.0E-7 1/yr design speed                    192.       183.       201.

   48  102    3.164E+03 1.0000     36     25     25
Point  3.459E-01  6.500E-02  1.841E+00  7.334E-05  1.378E-05  3.903E-04
Line   4.177E+00  1.715E+00  1.017E+01  3.354E-05  1.377E-05  8.171E-05
Strike Probability, 1/yr               1.069E-04  2.755E-05  4.720E-04
1.0E-5 1/yr design speed                    120.        90.       152.
1.0E-6 1/yr design speed                    161.       134.       190.
1.0E-7 1/yr design speed                    199.       172.       226.

   48  103    3.164E+03 1.0000     24     13     13
Point  1.741E-02  3.887E-03  7.795E-02  2.460E-06  5.495E-07  1.102E-05
Line   1.059E+00  3.548E-01  3.159E+00  5.668E-06  1.900E-06  1.691E-05
Strike Probability, 1/yr               8.129E-06  2.449E-06  2.793E-05
1.0E-5 1/yr design speed                     60.        60.        97.
1.0E-6 1/yr design speed                    117.        89.       145.
1.0E-7 1/yr design speed                    159.       134.       184.

   48  104    3.164E+03 1.0000     11      9      9
Point  7.151E-02  5.026E-03  1.018E+00  4.633E-06  3.256E-07  6.592E-05
Line   1.015E+00  3.547E-01  2.904E+00  2.490E-06  8.703E-07  7.127E-06
Strike Probability, 1/yr               7.123E-06  1.196E-06  7.305E-05
1.0E-5 1/yr design speed                     60.        60.       115.
1.0E-6 1/yr design speed                    112.        71.       159.
1.0E-7 1/yr design speed                    155.       121.       197.

   48  105    3.164E+03 1.0000     18     12     12
Point  7.381E-01  3.341E-02  1.631E+01  7.825E-05  3.542E-06  1.729E-03
Line   3.779E+00  9.252E-01  1.543E+01  1.517E-05  3.715E-06  6.197E-05
Strike Probability, 1/yr               9.342E-05  7.257E-06  1.791E-03
1.0E-5 1/yr design speed                    116.        60.       174.
1.0E-6 1/yr design speed                    158.       110.       211.
1.0E-7 1/yr design speed                    195.       151.       245.
```

```
   48  106    3.164E+03 1.0000     21     17     17
Point  4.996E-02  1.092E-02  2.285E-01  6.179E-06  1.351E-06  2.826E-05
Line   1.106E+00  4.867E-01  2.513E+00  5.181E-06  2.280E-06  1.177E-05
Strike Probability, 1/yr                1.136E-05  3.631E-06  4.004E-05
1.0E-5 1/yr design speed                      70.        60.       104.
1.0E-6 1/yr design speed                     122.        97.       149.
1.0E-7 1/yr design speed                     163.       140.       188.

   48  107    3.164E+03 1.0000      7      6      6
Point  1.696E-02  2.481E-03  1.160E-01  6.992E-07  1.023E-07  4.780E-06
Line   4.589E-01  1.906E-01  1.105E+00  7.166E-07  2.976E-07  1.725E-06
Strike Probability, 1/yr                1.416E-06  3.999E-07  6.506E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      77.        60.       114.
1.0E-7 1/yr design speed                     127.       100.       158.

   48  108    3.164E+03 1.0000      2      2      2
Point  2.575E-02  1.117E-03  5.936E-01  3.033E-07  1.315E-08  6.992E-06
Line   1.373E+00  5.956E-02  3.166E+01  6.127E-07  2.657E-08  1.412E-05
Strike Probability, 1/yr                9.159E-07  3.973E-08  2.112E-05
1.0E-5 1/yr design speed                      60.        50.        90.
1.0E-6 1/yr design speed                      60.        50.       140.
1.0E-7 1/yr design speed                     119.        50.       180.

   48  109    3.164E+03 1.0000      6      6      6
Point  4.698E-01  8.070E-03  2.735E+01  1.660E-05  2.852E-07  9.664E-04
Line   3.398E+00  6.096E-01  1.894E+01  4.549E-06  8.160E-07  2.536E-05
Strike Probability, 1/yr                2.115E-05  1.101E-06  9.918E-04
1.0E-5 1/yr design speed                      85.        60.       163.
1.0E-6 1/yr design speed                     132.        68.       201.
1.0E-7 1/yr design speed                     172.       119.       237.

   48  110    3.164E+03 1.0000      3      1      1
Point  1.136E-03  0.000E+00  0.000E+00  2.008E-08  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  1.339E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.539E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      80.        50.        50.

   48  111    3.164E+03 1.0000      7      3      3
Point  2.206E-03  5.360E-04  9.081E-03  9.096E-08  2.210E-08  3.744E-07
Line   2.280E-01  9.628E-02  5.400E-01  3.561E-07  1.504E-07  8.433E-07
Strike Probability, 1/yr                4.470E-07  1.725E-07  1.218E-06
1.0E-5 1/yr design speed                      60.        60.        60.
1.0E-6 1/yr design speed                      60.        60.        74.
1.0E-7 1/yr design speed                     105.        81.       130.

   48  112    3.164E+03 1.0000      3      2      2
Point  8.533E-04  5.569E-04  1.307E-03  1.508E-08  9.840E-09  2.310E-08
Line   1.502E-01  9.802E-02  2.301E-01  1.005E-07  6.560E-08  1.540E-07
Strike Probability, 1/yr                1.156E-07  7.544E-08  1.771E-07
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.        60.
1.0E-7 1/yr design speed                      71.        50.        86.

   48  113    3.164E+03 1.0000      0      0      0
```

```
   48  114    3.164E+03 1.0000      1      0      1
Point  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00  0.000E+00
Line   2.000E+00  0.000E+00  0.000E+00  4.462E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                4.462E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                     106.        50.        50.

   48  115    3.164E+03 1.0000      0      0      0

   48  116    3.164E+03 1.0000      3      3      3
Point  2.870E-01  2.905E-03  2.836E+01  5.071E-06  5.132E-08  5.011E-04
Line   1.278E+00  2.155E-01  7.582E+00  8.555E-07  1.442E-07  5.075E-06
Strike Probability, 1/yr                5.927E-06  1.956E-07  5.062E-04
1.0E-5 1/yr design speed                      60.        60.       152.
1.0E-6 1/yr design speed                     107.        60.       190.
1.0E-7 1/yr design speed                     150.        83.       227.

   48  117    3.164E+03 1.0000      3      1      1
Point  1.136E-03  0.000E+00  0.000E+00  2.008E-08  0.000E+00  0.000E+00
Line   2.000E-01  0.000E+00  0.000E+00  1.339E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                1.539E-07  0.000E+00  0.000E+00
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      80.        50.        50.

   48  118    3.164E+03 1.0000      5      5      5
Point  1.476E-01  7.451E-02  2.924E-01  4.346E-06  2.194E-06  8.609E-06
Line   2.598E+00  1.311E+00  5.145E+00  2.898E-06  1.463E-06  5.739E-06
Strike Probability, 1/yr                7.244E-06  3.657E-06  1.435E-05
1.0E-5 1/yr design speed                      60.        60.        78.
1.0E-6 1/yr design speed                     113.        95.       131.
1.0E-7 1/yr design speed                     155.       138.       172.

   48  119    3.164E+03 1.0000      3      3      3
Point  4.000E-03  1.023E-03  1.564E-02  7.067E-08  1.807E-08  2.764E-07
Line   3.883E-01  9.434E-02  1.598E+00  2.599E-07  6.314E-08  1.070E-06
Strike Probability, 1/yr                3.306E-07  8.121E-08  1.346E-06
1.0E-5 1/yr design speed                      60.        50.        60.
1.0E-6 1/yr design speed                      60.        50.        77.
1.0E-7 1/yr design speed                      99.        50.       132.

   48  120    3.164E+03 1.0000      0      0      0

   48  121    3.164E+03 1.0000      0      0      0

   48  122    2.215E+03 0.7000      2      2      2
Point  5.369E-03  5.079E-03  5.676E-03  9.035E-08  8.547E-08  9.551E-08
Line   3.000E-01  0.000E+00  0.000E+00  1.912E-07  0.000E+00  0.000E+00
Strike Probability, 1/yr                2.816E-07  8.547E-08  9.551E-08
1.0E-5 1/yr design speed                      60.        50.        50.
1.0E-6 1/yr design speed                      60.        50.        50.
1.0E-7 1/yr design speed                      94.        50.        50.

   48  123    3.164E+02 0.1000      0      0      0

   48  124    3.164E+02 0.1000      0      0      0

   48  125    0.000E+00 0.0000      0      0      0
```

NRC FORM 335
(9-2004)
NRCMD 3.7

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER
(Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, if any.)

NUREG/CR-4461, Rev 2

2. TITLE AND SUBTITLE

Tornado Climatology of the Contiguous United States

3. DATE REPORT PUBLISHED

MONTH	YEAR
February	2007

4. FIN OR GRANT NUMBER

JCN N6337

5. AUTHOR(S)

J.V. Ramsdell, Jr.
J.P. Rishel

6. TYPE OF REPORT

Technical

7. PERIOD COVERED *(Inclusive Dates)*

6/9/2006 to 12/31/2006

8. PERFORMING ORGANIZATION - NAME AND ADDRESS *(If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)*

Pacific Northwest National Laboratory
PO Box 999
Richland, WA 99352

9. SPONSORING ORGANIZATION - NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)*

Division of Risk Assesment & Special Projects
Office of Nuclear Regulatory Research
US Nuclear Regulatory Commission
Washington, DC 20555-0001

10. SUPPLEMENTARY NOTES

A.J. Buslik, NRC Project Manager

11. ABSTRACT *(200 words or less)*

Characteristics of tornadoes reported from January 1950 through August 2003 have been used to estimate tornado strike probabilities and maximum wind speeds. Maps included in this report show the distribution of tornado events and design wind speeds. Appendices contain the number of tornadoes and estimates of strike probabilities and maximum wind speeds by 1°, 2°, and 4° latitutde and longitude boxes. The primary difference between the climatology presented here and the climatology in NUREG/CR-4461, Rev 1 is that wind speed estimates in this climatology are based on the Enhanced Fujita Scale rather than the original Fujita Scale. The National Weather Service intends to implement the Enhanced Fujita Scale by February 2007. For a best estimate probability of 1.0E-7 per year, a maximum wind speed of about 230 mph is appropriate for tornadoes in the central United States, and maximum wind speeds of 200 mph and 160 mph are appropriate for regions of the United States along the east coast and the western great plains, and for the western United States, respectively. Corresponding wind speeds in NUREG/CR-4461 Rev. 1 were 300 mph, 260 mph, and 200 mph, respectively.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

Tornadoes, Characteristics, Distributions, Enhanced Fujita Scale, Strike Probabilities, Design Wind Speeds

13. AVAILABILITY STATEMENT

unlimited

14. SECURITY CLASSIFICATION

(This Page)

unclassified

(This Report)

unclassified

15. NUMBER OF PAGES

16. PRICE

PRINTED ON RECYCLED PAPER

Printed
on recycled
paper

Federal Recycling Program