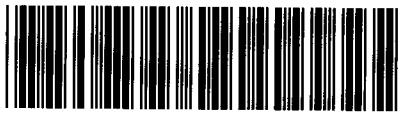

Control Number: 45587

Item Number: 12

Addendum StartPage: 0

PUC DOCKET NO. 45587

APPLICATION OF AQUA TEXAS, INC. DBA AQUA TEXAS TO AMEND CERTIFICATES OF CONVENIENCE OF AND NECESSITY IN MONTGOMERY COUNTY (ENCLAVE AT DOBBIN)	§ § § § §	**PUBLIC UTILITY COMMISSION OF TEXAS**

AQUA TEXAS' RESPONSE TO STAFF'S FIRST REQUEST FOR INFORMATION

To: Public Utility Commission of Texas Staff, by and through their attorney of record, Jessica Morgan, Public Utility Commission of Texas, 1701 N. Congress Avenue, P.O. Box 13326, Austin, Texas 78711-3326.

Aqua Texas, Inc. ("Aqua Texas") provides its response to PUC Staff's First Request for Information to Aqua Texas. Aqua Texas stipulates that the following response to request for information may be treated by all parties as if the answer was filed under oath.

Respectfully submitted,

THE TERRILL FIRM, P.C.

By: Geoffrey P. Kirshbaum

Paul M. Terrill III
State Bar No. 00785094
Geoffrey P. Kirshbaum
State Bar No. 24029665
810 West 10th Street
Austin, Texas 78701
Tel: (512) 474-9100
Fax: (512) 474-9888

ATTORNEYS FOR AQUA TEXAS, INC. D/B/A AQUA TEXAS

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CERTIFICATE OF SERVICE

I certify that a copy of this document will be served on all parties of record on April 28, 2016 in accordance with P.U.C. Procedural Rule 22.74.

Geoffrey P. Kirshbaum

RESPONSE TO REQUEST FOR INFORMATION

Staff 1-1 In reference to the application, attachment 13, page 3:

a) Please provide updated projections for the system based on a 5 year timeframe in a Microsoft Excel Format that also includes (1) monthly operating/maintenance expenses and net income for water and sewer and (2) the cost calculation totals to be paid by Aqua Texas and the Developer once all reimbursement occurs.

b) Please provide a basis, such as a rate study or other justification, for the projected water rate amount of $64.20 per connection and projected sewer rate of $63.80 per connection.

c) Please explain why "Develop Reimb By Aqua" amounts, totaling $370,000 included in the Aqua Texas Capital Outlay cost row for water but not for sewer or any of the other months regarding "Develop Reimb By Aqua" water cost.

RESPONSE:

a) Please see the Pro Forma document provided with this response which includes updated project information responsive to this request. Bates Nos. Dobbin 000001-000006. In previous discussions with Staff, Aqua Texas was requested to share its most recent depreciation study. Thus, Aqua Texas is also producing its depreciation study. Bates Nos. Dobbin 000007-000169.

b) Please see the Pro Forma document provided with this response which includes updated project information responsive to this request. Bates Nos. Dobbin 000001-000006. In previous discussions with Staff, Aqua Texas was requested to share its most recent depreciation study. Thus, Aqua Texas is also producing its depreciation study. Bates Nos. Dobbin 000007-000169.

c) Please see the Pro Forma document provided with this response which includes updated project information responsive to this request. Bates Nos. Dobbin 000001-000006. In previous discussions with Staff, Aqua Texas was requested to share its most recent depreciation study. Thus, Aqua Texas is also producing its depreciation study. Bates Nos. Dobbin 000007-000169.

Prepared by: K. Crandal McDougall (Controller)
Sponsored by: K. Crandal McDougall (Controller)

Staff 1-2 Please provide documentation demonstrating sufficient cash is available to cover any projected operations and maintenance shortages in the first five years of operations. Please note whether an affiliated interest intends to provide a written guarantee of coverage of temporary cash shortages.

RESPONSE: Aqua does not project any operations and maintenance shortages associated with this project as illustrated by the updated projections included in the Pro Forma document provided with this response. Bates Nos. Dobbin 000001-000006. Aqua's Annual Report excerpts included as Attachment 3 to the Application demonstrate that Aqua has sufficient cash for project needs.

Prepared by: K. Crandal McDougall (Controller)
Sponsored by: K. Crandal McDougall (Controller)

Project Information - Enclave at Dobbin

Pro Forma Assumptions: All operational costs are based on the Southeast Region average per customer costs, with the exception of the Hold and Haul for the Sludge line in Year One.

Please note that in Year One for the Sewer Pro Forma the only cost is for Hold and Haul as no operational costs will be incurred as there will be nothing to operate. The WWTP does not come on line until Year Two. The District is responsible for Hold and Haul Costs.

Developer: Westchase Madison, Inc.

Location:

State TX
County Montgomery

Description of Service Area

The proposed utility service area is located approximately **13.7 miles Southwest of downtown Conroe**, Texas, and is **generally** bounded on the north by **Hardin Store Rd.** ; on the east by **Dobbin Huffsmith Rd.**; on the south by **Carraway Ln.**; and on the west by **N. Creek Dr.** The total area being requested includes approximately 67 acres.

roximity to nearest Aqua System:

This project is generally located in Aqua's service area near other systems currently in operation.

Capital:

Capital Discussion: Note that distribution and collection cost assume full $5,000 per home payout to developer. The 5k is a cap, if the distribution and collection system certified cost is less than 5k per home, reimbursements will be limited to actual certified cost. Additionally, reimbursements do not begin until 200 homes have been connected and are receiving service.

Number of Customers:	Start	Year 2 add	Year 3 add	Year 4 add	Year 5 add	Total
Water:	74	74	120	28	0	296
Wastewater:	74	74	120	28	0	296
Total	148	148	240	56	0	592

Rates:	Current	Aqua	Others
Water			
Base		31.00	
Per		5.01	
Per			
Per			
Average Consumption:	7,000.00		
Average Monthly Water Bill:	0.00	66.07	
Average Annual Bill:	0.00	792.84	
Average Annual Total Revenue W	0.00	234,680.64	At Full Buildout
Wastewater:		63.80	
Base		63.80	
Per			
Average Consumption:			
verage Monthly WW Bill:		63.80	
verage Annual Bill:		765.60	
verage Annual Total Revenue WW		226,617.60	

Total Project

	A	B	C	D	E	F	G	H	I
1									
2				**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
3									
4		Capital		311,200	765,900	1,173,600	105,000	0	2,355,700
5									
6		Total Net Capital Spend		311,200	1,070,094	2,222,442	2,282,916	2,236,306	
7									
8		Depreciation		(7,006)	(21,251)	(44,526)	(46,610)	(46,610)	
9									
10		Investment at Year End		304,194	1,048,842	2,177,916	2,236,306	2,189,697	
11									
12		Initial Customer Count			148	296	536	592	
13		Growth in Customers		148	148	240	56	0	
14		Total Customers		148	296	536	592	592	
15									
16		Customer Charge	48.06	94.80	94.80	94.80	94.80	94.80	
17		Rate per 1000 Gallons	4.05	5.01	5.01	5.01	5.01	5.01	
18		Rate per 20,000 Gallons	5.80						
19									
20									
21		Average Monthly Billing per Customer	6,593	127.83	127.83	127.83	127.83	127.83	
22									
23		Monthly Expected per customer billing		9,610	19,221	34,805	38,442	38,442	
24									
25		Total Annual Billing		202,670	230,649	417,662	461,298	461,298	
26									
27		Revenue		202,670	230,649	417,662	461,298	461,298	
28									
29		Expenses:							
30		Operational		(162,915)	(98,657)	(184,009)	(209,331)	(215,611)	
31		Depreciation		(7,006)	(21,251)	(44,526)	(46,610)	(46,610)	
32									
33		Taxes other than income		(11,773)	(24,253)	(48,571)	(55,255)	(56,913)	
34									
35		Operating Income		20,975	86,488	140,556	150,103	142,165	
36									
37		Interest on LT Debt	5.1%	9,162	14,644	56,672	58,214	57,026	
38			4,134.53						
39		Income tax Fed		4,135	25,145	29,359	32,161	29,799	
40		Income tax state		263	1,602	1,871	2,049	1,899	
41									
42		Net Income		7,415	45,096	52,654	57,678	53,442	
43									
44									
45		Inflation Rate for Costs from base yr	1.03		1.03	1.06	1.09	1.13	

Water Pro Forma

	A	B	C	D	E	F	G	H
1				Year 1	Year 2	Year 3	Year 4	Year 5
3		Capital		359,300	222,000	394,000	33,600	0
5		Total Net Capital Spend		359,300	574,294	956,958	971,540	951,866
7		Depreciation	2.0%	(7,006)	(11,335)	(19,018)	(19,674)	(19,674)
9		Investment at Year End		352,294	562,958	937,940	951,866	932,193
11		Initial Customer Count		0	74	148	268	296
12		Growth in Customers		74	74	120	28	0
13		Total Customers		74	148	268	296	296
15		Customer Charge	31.00	31.00	31.00	31.00	31.00	31.00
16		Rate per 1000 Gallons	5.01	5.01	5.01	5.01	5.01	5.01
20		Average Monthly Billing per Customer	7,000	66.07	66.07	66.07	66.07	66.07
22		Monthly Expected per customer billing		4,889	9,778	17,707	19,557	19,557
24		Total Annual Billing		58,670	117,340	212,481	234,681	234,681
26		Revenue		58,670	117,340	212,481	234,681	234,681
27		Annual Per customer		792.84	792.84	792.84	792.84	792.84
28		Expenses:						
29		Operational		(18,915)	(38,966)	(72,677)	(82,678)	(85,158)
30		Depreciation		(7,006)	(11,335)	(19,018)	(19,674)	(19,674)
32		Taxes other than income	159.10	(11,773)	(24,253)	(45,235)	(51,460)	(53,004)
34		Operating Income		20,975	42,786	75,551	80,870	76,845
36		Interest on LT Debt	5.1%	9,162	14,644	24,402	24,774	24,273
38		Income tax Fed	35.00%	4,135	9,850	17,902	19,633	18,400
39		Income tax state	2.23%	263	628	1,141	1,251	1,172
41		Net Income		7,415	17,665	32,106	35,211	33,000
44		Inflation Rate for Costs from base yr	1.03		1.03	1.06	1.09	1.13

Wastewater Pro Forma

	A	B	C	D	E	F	G	H
1				Year 1	Year 2	Year 3	Year 4	Year 5
2								
3		Capital		(48,100)	543,900	779,600	71,400	0
4								
5		Total Net Capital Spend		(48,100)	495,800	1,265,484	1,311,376	1,284,440
6								
7		Depreciation	2.0%		(9,916)	(25,508)	(26,936)	(26,936)
8								
9		Investment at Year End		(48,100)	485,884	1,239,976	1,284,440	1,257,504
10								
11		Initial Customer Count	74		74	148	268	296
12		Growth in Customers		74	74	120	28	0
13		Total Customers		74	148	268	296	296
14								
15		Customer Charge	63.80	63.80	63.80	63.80	63.80	63.80
16								
17		**District Minimum Charge**		**87,346**		**0**	**0**	**0**
18								
19								
20		Average Monthly Billing per Customer	0	63.80	63.80	63.80	63.80	63.80
21								
22		Monthly Expected per customer billing		4,721	9,442	17,098	18,885	18,885
23								
24		Total Annual Billing		144,000	113,309	205,181	226,618	226,618
25								
26		Revenue		144,000	113,309	205,181	226,618	226,618
27								
28		Expenses:						
29		Operational		(144,000)	(59,691)	(111,332)	(126,653)	(130,453)
30		Depreciation		0	(9,916)	(25,508)	(26,936)	(26,936)
31								
32		Taxes other than income	11.73			(3,336)	(3,795)	(3,909)
33								
34		Operating Income		0	43,702	65,004	69,233	65,320
35								
36		Interest on LT Debt	5.1%			32,270	33,440	32,753
37								
38		Income tax Fed	35.00%	0	15,296	11,457	12,528	11,398
39		Income tax state	2.23%	0	975	730	798	726
40								
41		Net Income		0	27,431	20,547	22,467	20,442
42								
43								
44		Inflation Rate for Costs from base yr	1.03		1.03	1.06	1.09	1.13

Water Capital

Distribution system cost	532,800					
Number of customers per year	74	74	120	28	0	296
	1,800					

	Year 1	Year 2	Year 3	Year 4	Year 5	
Tap Fee less Meter cost as CIAC	(40,700)	(44,400)	(72,000)	(16,800)	0	(173,900)
Well	250,000		200,000			
Distribution system cost paid to Developer	0	266,400	216,000	50,400	0	532,800
Plant	150,000		50,000			
	359,300	222,000	394,000	33,600	0	1,008,900

68	Badger Meter
27	Meter Box plus lid
55	ERT
50	Labor
200	Meter and install

Wastewater Capital

Collection system cost	947,200								
Number of customers per year	74	74	120	28	0	296			
	3,200							3,200	64%
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**			1,800	36%
								5,000	5,000
Treatment Plant		592,000							
Site cost									
Tap Fee as CIAC	(48,100)	(48,100)	(78,000)	(18,200)	0	(192,400)			
Collection system cost paid to Developer			857,600	89,600	0	947,200			
									Total Invest
	(48,100)	543,900	779,600	71,400	0	1,346,800	1,008,900		2,355,700

AQUA TEXAS, INC.

Austin, Texas

DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS

RELATED TO UTILITY PLANT

AS OF DECEMBER 31, 2010

GANNETT FLEMING, INC. - VALUATION AND RATE DIVISION

Harrisburg, Pennsylvania

January 3, 2012

Aqua Texas, Inc.
1106 Clayton Lane, Suite 400W
Austin, TX 78723

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Attention Stan F. Szczygiel
Manager of Rates and Planning

Ladies and Gentlemen:

Pursuant to your request, we have conducted a depreciation study related to the water plant of Aqua Texas, Inc. as of December 31, 2010. The attached report presents a description of the methods used in the estimation of depreciation, the summary of annual and accrued depreciation, the statistical support for the life and net salvage estimates and the detailed tabulations of annual and accrued depreciation.

Respectfully submitted,

GANNETT FLEMING, INC.

John J. Spanos

JOHN J. SPANOS
Vice President
Valuation and Rate Division

JJS:krm

054668

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PART I. INTRODUCTION

PART II. METHODS USED IN THE ESTIMATION OF DEPRECIATION

PART III. RESULTS OF STUDY

CONTENTS, cont.

PART III. RESULTS OF STUDY, cont.

-1

PART I. INTRODUCTION

AQUA TEXAS, INC.

DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS
RELATED TO UTILITY PLANT
AS OF DECEMBER 31, 2010

PART I. INTRODUCTION

SCOPE

This report presents the results of the depreciation study prepared for Aqua Texas, Inc. as applied to water plant in service as of December 31, 2010. It relates to the concepts, methods, and basic judgments which underlie recommended annual depreciation accrual rates related to current utility plant in service.

The service life and net salvage estimates resulting from the study were based on informed judgment which incorporated analyses of historical plant retirement data as recorded through 2010; a review of Company practice and outlook as they relate to plant operation and retirement; and consideration of current practice in the water industry, including knowledge of service life and salvage estimates used for other water properties.

PLAN OF REPORT

Part I, Introduction, includes brief statements of the scope and basis of the study. Part II presents descriptions of the methods used in the service life and salvage studies and the methods and procedures used in the calculation of depreciation. Part III presents the results of the study, including summary tables, survivor curve charts and life tables resulting from the retirement rate method of analysis, tabular results of the historical net salvage analyses, and detailed tabulations of the calculated remaining lives and annual accruals.

BASIS OF STUDY

Depreciation

For most accounts, the annual depreciation was calculated by the straight line method, using the average service life procedure and the remaining life basis. For certain General Plant accounts, the annual depreciation was based on amortization accounting. The calculated remaining lives and annual depreciation accrual rates were based on attained ages of plant in service and the estimated service life and salvage characteristics of each depreciable group.

Survivor Curve Estimates

The procedure for estimating survivor curves, which define service lives and remaining lives, consisted of compiling historical service life data for the plant accounts or other depreciable groups, analyzing the historical data base through the use of accepted techniques, and forecasting the survivor characteristics for each depreciable account or group. These forecasts were based on interpretations of the historical data analyses and the probable future. The combination of the historical data and the estimated future trend yields a complete pattern of life characteristics, i.e., a survivor curve, from which the average service life and remaining service life are derived.

The historical data analyzed for life estimation purposes were compiled through 2010 from the Company's plant accounting records. Such data included plant additions, retirements, transfers and other activity recorded by the Company for each of its plant accounts and subaccounts.

The estimates of net salvage incorporated a review of experienced costs of removal and salvage related to plant retirements, and considerations of trends exhibited by the historical data. Each component of net salvage, i.e., cost of removal and salvage was

stated in dollars and as a percent of retirement for purposes of estimating average future levels of the components, as well as of net salvage.

An understanding of the function of the plant and information with respect to the reasons for past retirements and the expected causes of future retirements was obtained through field trips and discussions with operating and management personnel. The supplemental information obtained in this manner was considered in the interpretation and extrapolation of the statistical analyses.

Calculation of Depreciation

The depreciation accrual rates were calculated using the straight line method, the remaining life basis, and the average service life depreciation procedure. The change to amortization accounting for certain accounts is recommended because of the disproportionate plant accounting effort required when compared to the minimal original cost of the large number of items in these accounts. An explanation of the calculation of annual and accrued amortization is presented on page II-28 of the report.

PART II. METHODS USED IN

THE ESTIMATION OF DEPRECIATION

PART II. METHODS USED IN THE ESTIMATION OF DEPRECIATION

DEPRECIATION

Depreciation, in public utility regulation, is the loss in service value not restored by current repairs or covered by insurance.

Depreciation as used in accounting is a method of distributing fixed capital costs, less net salvage, over a period of time by allocating annual amounts to expense. Each annual amount of such depreciation expense is part of that year's total cost of providing utility service. Normally, the period of time over which the fixed capital cost is allocated to the cost of service is equal to the period of time over which an item renders service, that is, the item's service life. The most prevalent method of allocation is to distribute an equal amount of cost to each year of service life. This method is known as the straight line method of depreciation.

The calculation of annual depreciation based on the straight line method requires the estimation of average life and salvage. These subjects are discussed in the sections which follow.

SERVICE LIFE AND NET SALVAGE ESTIMATION

Average Service Life

The use of an average service life for a property group implies that the various units in the group have different lives. Thus, the average life may be obtained by determining the separate lives of each of the units, or by constructing a survivor curve by plotting the number of units which survive at successive ages. A discussion of the general concept of survivor curves is presented. Also, the Iowa type survivor curves are reviewed.

Survivor Curves

The survivor curve graphically depicts the amount of property existing at each age throughout the life of an original group. From the survivor curve, the average life of the group, the remaining life expectancy, the probable life, and the frequency curve can be calculated. In Figure 1 a typical smooth survivor curve and the derived curves are illustrated. The average life is obtained by calculating the area under the survivor curve, from age zero to the maximum age, and dividing this area by the ordinate at age zero. The remaining life expectancy at any age can be calculated by obtaining the area under the curve, from the observation age to the maximum age, and dividing this area by the percent surviving at the observation age. For example, in Figure 1 the remaining life at age 30 years is equal to the crosshatched area under the survivor curve divided by 29.5 percent surviving at age 30. The probable life at any age is developed by adding the age and remaining life. If the probable life of the property is calculated for each year of age, the probable life curve shown in the chart can be developed. The frequency curve presents the number of units retired in each age interval and is derived by obtaining the differences between the amount of property surviving at the beginning and at the end of each interval.

Iowa Type Curves. The range of survivor characteristics usually experienced by utility and industrial properties is encompassed by a system of generalized survivor curves known as the Iowa type curves. There are four families in the Iowa system, labeled in accordance with the location of the modes of the retirements in relationship to the average life and the relative height of the modes. The left moded curves, presented in Figure 2, are those in which the greatest frequency of retirement occurs to the left of, or prior to, average service life. The symmetrical moded curves, presented in Figure 3, are those in which the greatest frequency of retirement occurs at average service life. The right moded curves,

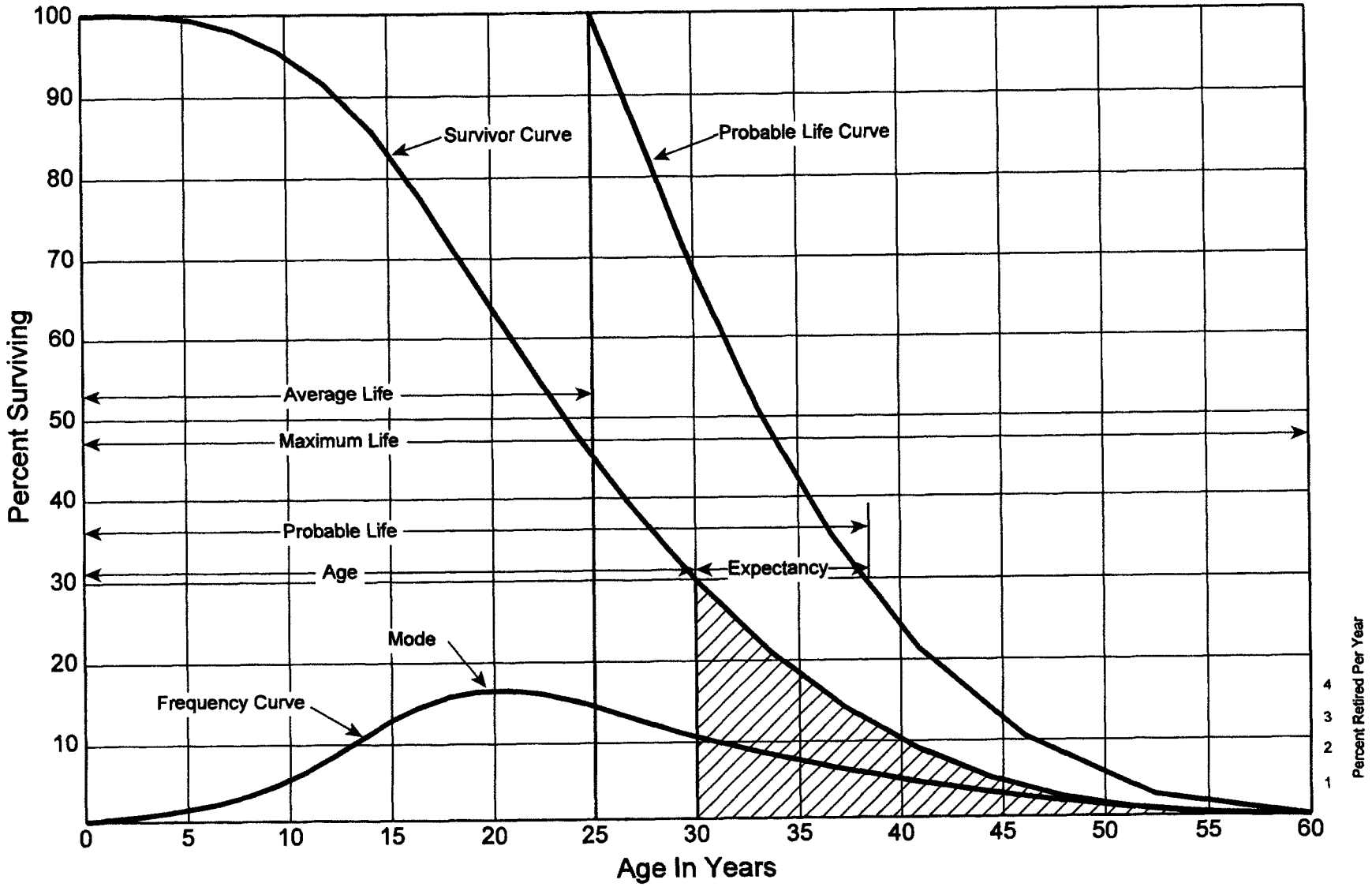

Figure 1. A Typical Survivor Curve and Derived Curves

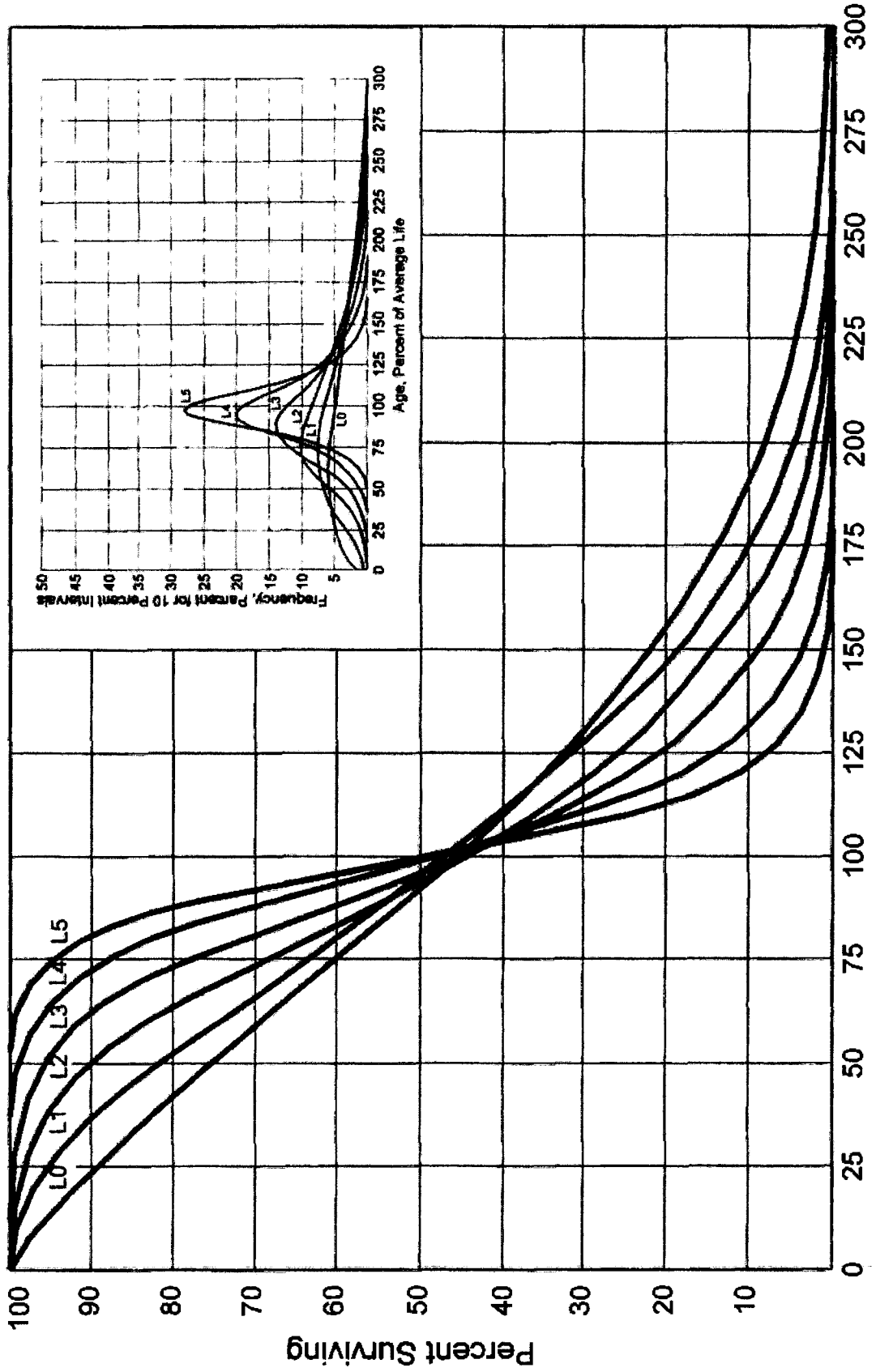

Figure 2. Left Modal or "L" Iowa Type Survivor Curves

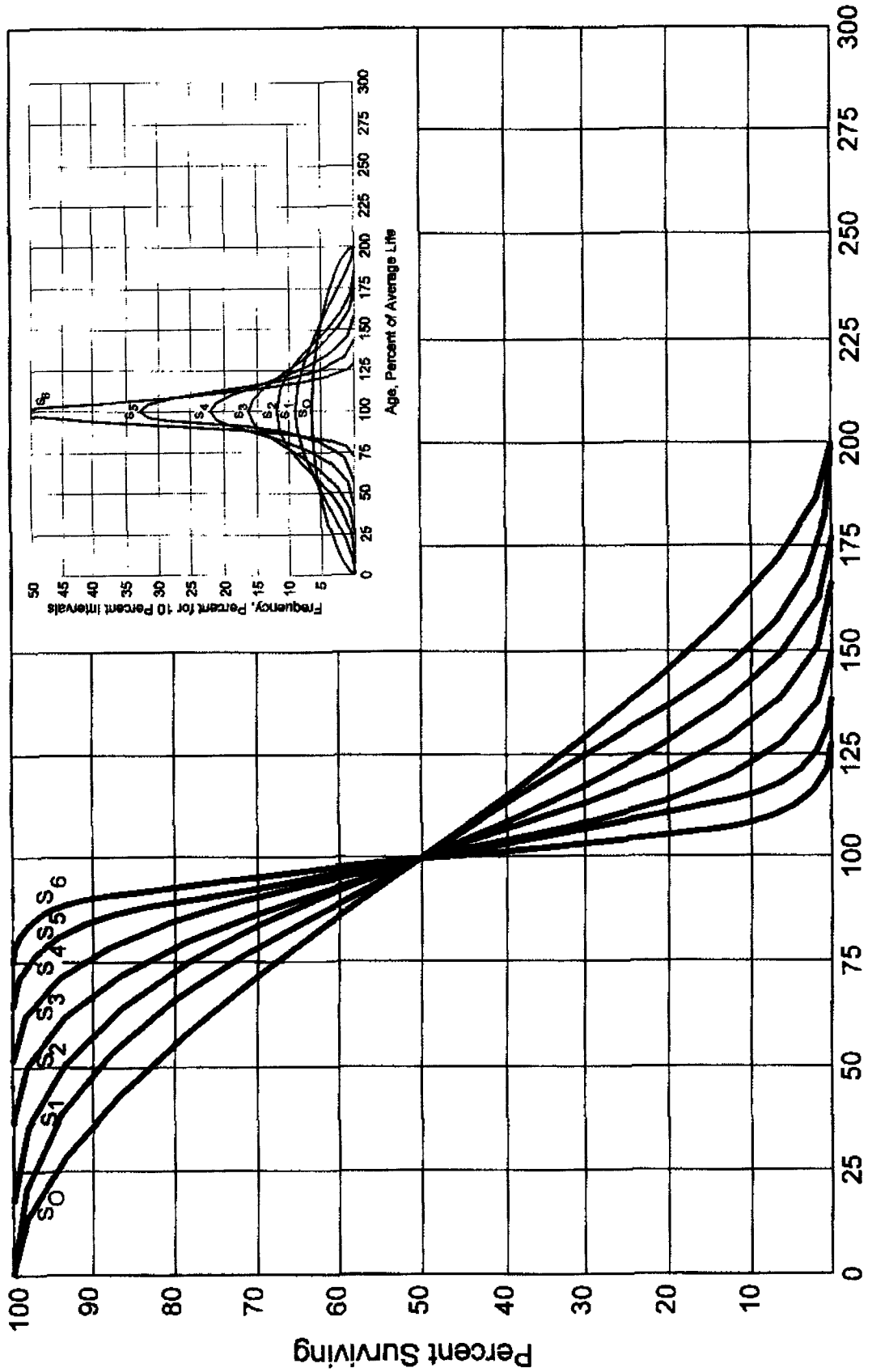

Figure 3. Symmetrical or "S" Iowa Type Survivor Curves

presented in Figure 4, are those in which the greatest frequency occurs to the right of, or after, average service life. The origin moded curves, presented in Figure 5, are those in which the greatest frequency of retirement occurs at the origin, or immediately after age zero. The letter designation of each family of curves (L, S, R or O) represents the location of the mode of the associated frequency curve with respect to the average service life. The numbers represent the relative heights of the modes of the frequency curves within each family.

The Iowa curves were developed at the Iowa State College Engineering Experiment Station through an extensive process of observation and classification of the ages at which industrial property had been retired. A report of the study which resulted in the classification of property survivor characteristics into 18 type curves, which constitute three of the four families, was published in 1935 in the form of the Experiment Station's Bulletin 125.[1] These type curves have also been presented in subsequent Experiment Station bulletins and in the text, "Engineering Valuation and Depreciation."[2] In 1957, Frank V. B. Couch, Jr., an Iowa State College graduate student, submitted a thesis[3] presenting his development of the fourth family consisting of the four O type survivor curves.

Retirement Rate Method of Analysis

The retirement rate method is an actuarial method of deriving survivor curves using the average rates at which property of each age group is retired. The method relates to

---

[1]Winfrey, Robley. Statistical Analyses of Industrial Property Retirements. Iowa State College, Engineering Experiment Station, Bulletin 125. 1935.

[2]Marston, Anson, Robley Winfrey and Jean C. Hempstead. Engineering Valuation and Depreciation, 2nd Edition. New York, McGraw-Hill Book Company. 1953.

[3]Couch, Frank V. B., Jr. "Classification of Type O Retirement Characteristics of Industrial Property." Unpublished M.S. thesis (Engineering Valuation). Library, Iowa State College, Ames, Iowa. 1957.

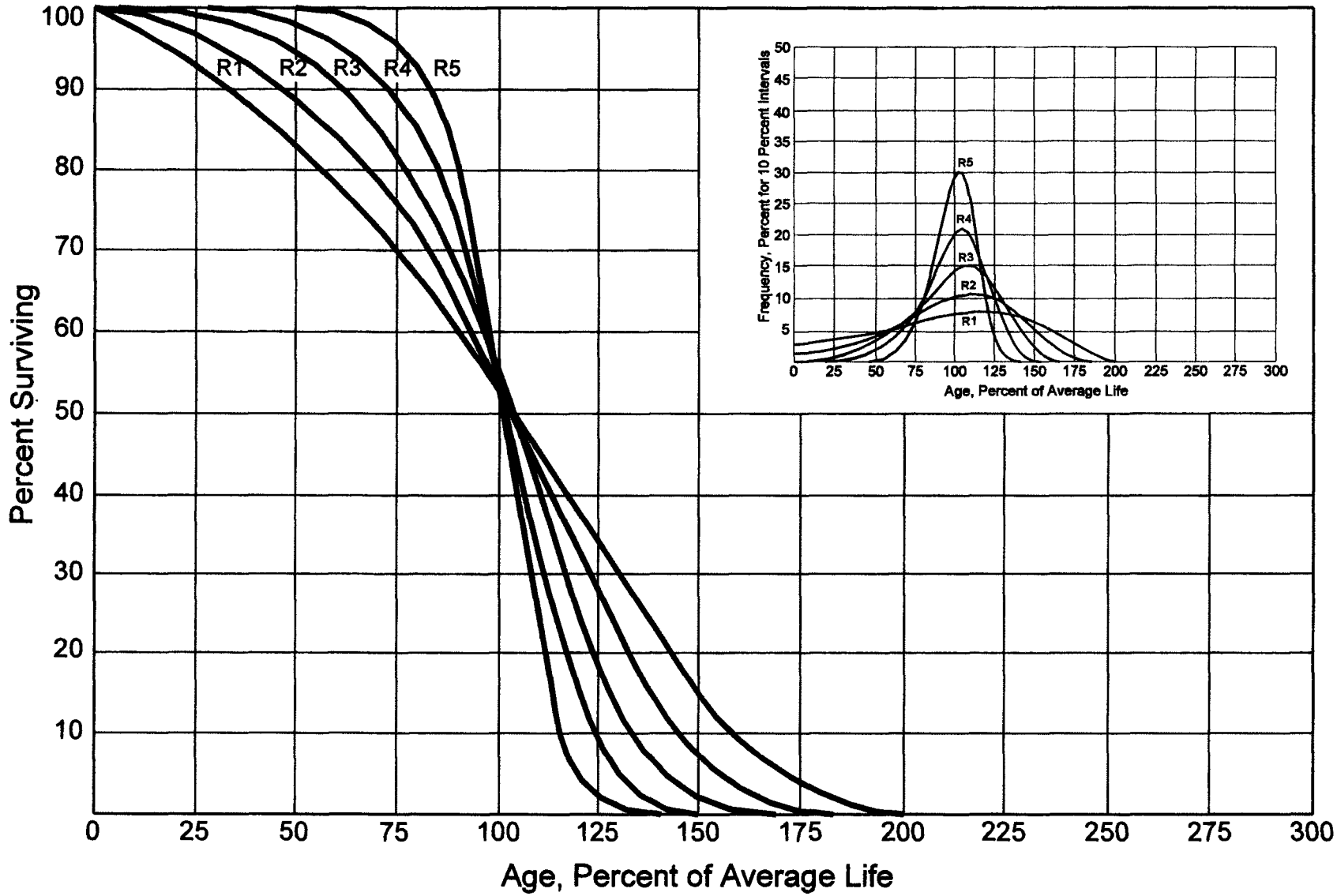

Figure 4. Right Modal or "R" Iowa Type Survivor Curves

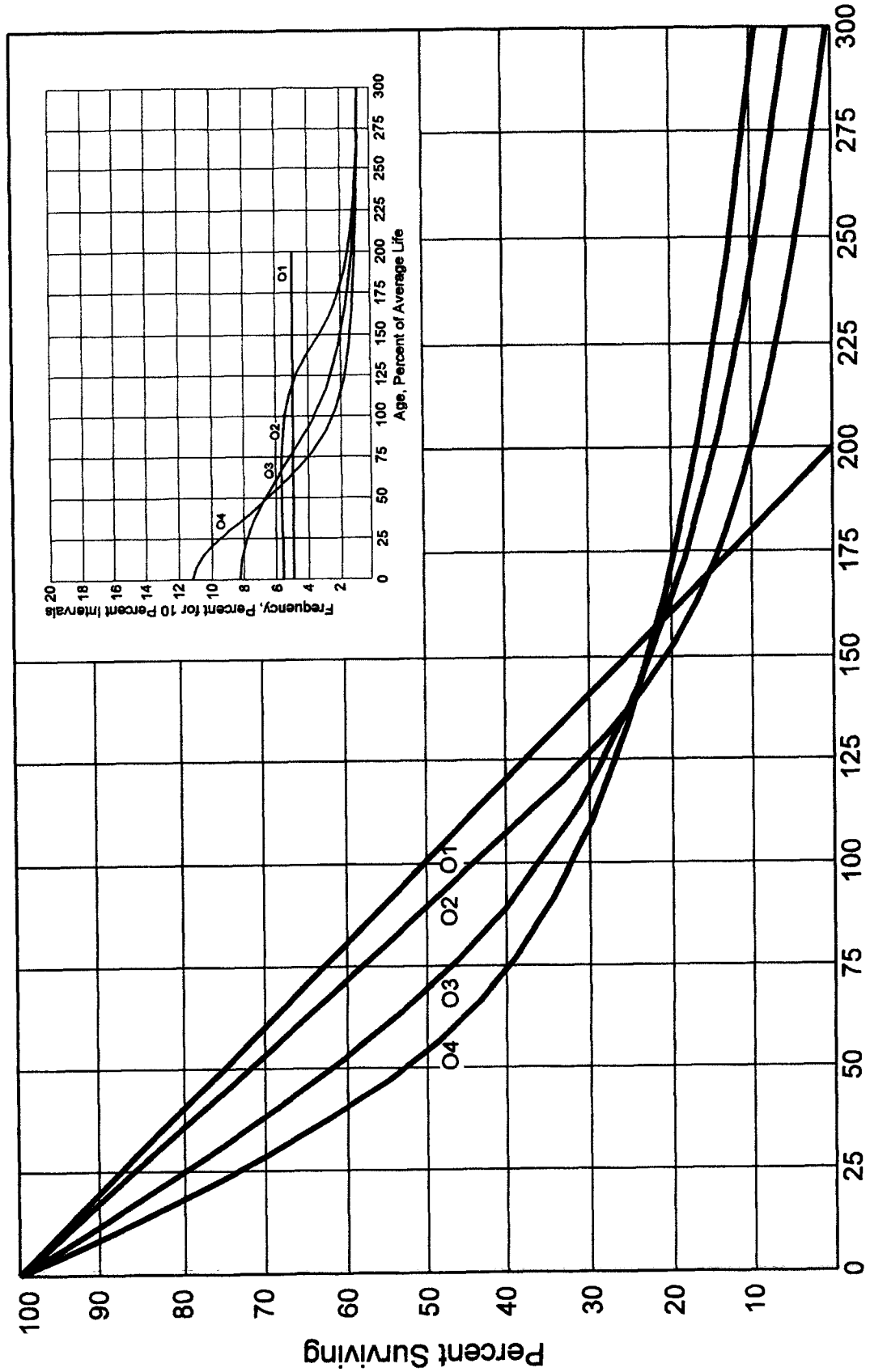

Figure 5. Origin Modal or "O" Iowa Type Survivor Curves

property groups for which aged accounting experience is available or for which aged accounting experience is developed by statistically aging unaged amounts and is the method used to develop the original stub survivor curves in this study. The method (also known as the annual rate method) is illustrated through the use of an example in the following text, and is also explained in several publications, including "Statistical Analyses of Industrial Property Retirements,"[4] "Engineering Valuation and Depreciation,"[5] and "Depreciation Systems."[6]

The average rate of retirement used in the calculation of the percent surviving for the survivor curve (life table) requires two sets of data: first, the property retired during a period of observation, identified by the property's age at retirement; and second, the property exposed to retirement at the beginnings of the age intervals during the same period. The period of observation is referred to as the experience band, and the band of years which represent the installation dates of the property exposed to retirement during the experience band is referred to as the placement band. An example of the calculations used in the development of a life table follows. The example includes schedules of annual aged property transactions, a schedule of plant exposed to retirement, a life table, and illustrations of smoothing the stub survivor curve.

Schedules of Annual Transactions in Plant Records. The property group used to illustrate the retirement rate method is observed for the experience band 2001-2010 during which there were placements during the years 1996-2010. In order to illustrate the summation of the aged data by age interval, the data were compiled in the manner

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[4]Winfrey, Robley, Supra Note 1.

[5]Marston, Anson, Robley Winfrey, and Jean C. Hempstead, Supra Note 2.

[6]Wolf, Frank K. and W. Chester Fitch. Depreciation Systems. Iowa State University Press. 1994

presented in Tables 1 and 2 on pages II-12 and II-13. In Table 1, the year of installation (year placed) and the year of retirement are shown. The age interval during which a retirement occurred is determined from this information. In the example which follows, $10,000 of the dollars invested in 1996 were retired in 2001. The $10,000 retirement occurred during the age interval between 4½ and 5½ years on the basis that approximately one-half of the amount of property was installed prior to and subsequent to July 1 of each year. That is, on the average, property installed during a year is placed in service at the midpoint of the year for the purpose of the analysis. All retirements also are stated as occurring at the midpoint of a one-year age interval of time, except the first age interval which encompasses only one-half year.

The total retirements occurring in each age interval in a band are determined by summing the amounts for each transaction year-installation year combination for that age interval. For example, the total of $143,000 retired for age interval 4½-5½ is the sum of the retirements entered on Table 1 immediately above the stairstep line drawn on the table beginning with the 2001 retirements of 1996 installations and ending with the 2010 retirements of the 2005 installations. Thus, the total amount of 143 for age interval 4½-5½ equals the sum of:

$$10 + 12 + 13 + 11 + 13 + 13 + 15 + 17 + 19 + 20.$$

In Table 2, other transactions which affect the group are recorded in a similar manner. The entries illustrated include transfers and sales. The entries which are credits to the plant account are shown in parentheses. The items recorded on this schedule are

TABLE 1. RETIREMENTS FOR EACH YEAR 2001-2010 SUMMARIZED BY AGE INTERVAL

Experience Band 2001-2010

Placement Band 1996-2010

Year Placed (1)	Retirements, Thousands of Dollars During Year 2001 (2)	2002 (3)	2003 (4)	2004 (5)	2005 (6)	2006 (7)	2007 (8)	2008 (9)	2009 (10)	2010 (11)	Total During Age Interval (12)	Age Interval (13)
1996	10	11	12	13	14	16	23	24	25	26	26	13½-14½
1997	11	12	13	15	16	18	20	21	22	19	44	12½-13½
1998	11	12	13	14	16	17	19	21	22	18	64	11½-12½
1999	8	9	10	11	11	13	14	15	16	17	83	10½-11½
2000	9	10	11	12	13	14	16	17	19	20	93	9½-10½
2001	4	9	10	11	12	13	14	15	16	20	105	8½-9½
2002		5	11	12	13	14	15	16	18	20	113	7½-8½
2003			6	12	13	15	16	17	19	19	124	6½-7½
2004				6	13	15	16	17	19	19	131	5½-6½
2005					7	14	16	17	19	20	143	4½-5½
2006						8	18	20	22	23	146	3½-4½
2007							9	20	22	25	150	2½-3½
2008								11	23	25	151	1½-2½
2009									11	24	153	½-1½
2010	—	—	—	—	—	—	—	—	—	13	80	0-½
Total	53	68	86	106	128	157	196	231	273	308	1,606	

TABLE 2. OTHER TRANSACTIONS FOR EACH YEAR 2001-2010
SUMMARIZED BY AGE INTERVAL

Experience Band 2001-2010 — Placement Band 1996-2010

Year Placed (1)	Acquisitions, Transfers and Sales, Thousands of Dollars During Year 2001 (2)	2002 (3)	2003 (4)	2004 (5)	2005 (6)	2006 (7)	2007 (8)	2008 (9)	2009 (10)	2010 (11)	Total During Age Interval (12)	Age Interval (13)
1996	-	-	-	-	-	-	60[a]	-	-	-	-	13½-14½
1997	-	-	-	-	-	-	-	-	-	-	-	12½-13½
1998	-	-	-	-	-	-	-	-	-	-	-	11½-12½
1999	-	-	-	-	-	-	-	(5)[b]	-	-	60	10½-11½
2000	-	-	-	-	-	-	-	6[a]	-	-	-	9½-10½
2001		-	-	-	-	-	-	-	-	-	(5)	8½-9½
2002		-	-	-	-	-	-	-	-	-	6	7½-8½
2003			-	-	-	-	-	-	-	-	-	6½-7½
2004				-	-	-	-	(12)[b]	-	-	-	5½-6½
2005					-	-	-	-	22[a]	-	-	4½-5½
2006						-	-	(19)[b]	-	-	10	3½-4½
2007							-	-	-	-	-	2½-3½
2008								-	-	(102)[c]	(121)	1½-2½
2009									-	-	-	½-1½
2010	—	—	—	—	—	—	—	—	—	—	-	0-½
Total	-	-	-	-	-	-	60	(30)	22	(102)	(50)	

[a] Transfer Affecting Exposures at Beginning of Year
[b] Transfer Affecting Exposures at End of Year
[c] Sale with Continued Use
Parentheses denote Credit amount.

not totaled with the retirements but are used in developing the exposures at the beginning of each age interval.

Schedule of Plant Exposed to Retirement. The development of the amount of plant exposed to retirement at the beginning of each age interval is illustrated in Table 3 on page II-15.

The surviving plant at the beginning of each year from 2001 through 2010 is recorded by year in the portion of the table headed "Annual Survivors at the Beginning of the Year." The last amount entered in each column is the amount of new plant added to the group during the year. The amounts entered in Table 3 for each successive year following the beginning balance or addition are obtained by adding or subtracting the net entries shown on Tables 1 and 2. For the purpose of determining the plant exposed to retirement, transfers-in are considered as being exposed to retirement in this group at the beginning of the year in which they occurred, and the sales and transfers-out are considered to be removed from the plant exposed to retirement at the beginning of the following year. Thus, the amounts of plant shown at the beginning of each year are the amounts of plant from each placement year considered to be exposed to retirement at the beginning of each successive transaction year. For example, the exposures for the installation year 2006 are calculated in the following manner:

Exposures at age 0 = amount of addition	= $750,000
Exposures at age ½ = $750,000 - $ 8,000	= $742,000
Exposures at age 1½ = $742,000 - $18,000	= $724,000
Exposures at age 2½ = $724,000 - $20,000 - $19,000	= $685,000
Exposures at age 3½ = $685,000 - $22,000	= $663,000

For the entire experience band 2001-2010, the total exposures at the beginning of an age interval are obtained by summing diagonally in a manner similar to the summing

TABLE 3. PLANT EXPOSED TO RETIREMENT
JANUARY 1 OF EACH YEAR 2001-2010
SUMMARIZED BY AGE INTERVAL

Experience Band 2001-2010

Placement Band 1996-2010

Year Placed (1)	Exposures, Thousands of Dollars — Annual Survivors at the Beginning of the Year										Total at Beginning of Age Interval (12)	Age Interval (13)
	2001 (2)	2002 (3)	2003 (4)	2004 (5)	2005 (6)	2006 (7)	2007 (8)	2008 (9)	2009 (10)	2010 (11)		
1996	255	245	234	222	209	195	239	216	192	167	167	13½-14½
1997	279	268	256	243	228	212	194	174	153	131	323	12½-13½
1998	307	296	284	271	257	241	224	205	184	162	531	11½-12½
1999	338	330	321	311	300	289	276	262	242	226	823	10½-11½
2000	376	367	357	346	334	321	307	297	280	261	1,097	9½-10½
2001	420[a]	416	407	397	386	374	361	347	332	316	1,503	8½-9½
2002		460[a]	455	444	432	419	405	390	374	356	1,952	7½-8½
2003			510[a]	504	492	479	464	448	431	412	2,463	6½-7½
2004				580[a]	574	561	546	530	501	482	3,057	5½-6½
2005					660[a]	653	639	623	628	609	3,789	4½-5½
2006						750[a]	742	724	685	663	4,332	3½-4½
2007							850[a]	841	821	799	4,955	2½-3½
2008								960[a]	949	926	5,719	1½-2½
2009									1,080[a]	1,069	6,579	½-1½
2010										1,220[a]	7,490	0-½
Total	1,975	2,382	2,824	3,318	3,872	4,494	5,247	6,017	6,852	7,799	44,780	

[a] Additions during the year.

of the retirements during an age interval (Table 1). For example, the figure of 3,789, shown as the total exposures at the beginning of age interval 4½-5½, is obtained by summing:

255 + 268 + 284 + 311 + 334 + 374 + 405 + 448 + 501 + 609.

Original Life Table. The original life table, illustrated in Table 4 on page II-17, is developed from the totals shown on the schedules of retirements and exposures, Tables 1 and 3, respectively. The exposures at the beginning of the age interval are obtained from the corresponding age interval of the exposure schedule, and the retirements during the age interval are obtained from the corresponding age interval of the retirement schedule. The retirement ratio is the result of dividing the retirements during the age interval by the exposures at the beginning of the age interval. The percent surviving at the beginning of each age interval is derived from survivor ratios, each of which equals one minus the retirement ratio. The percent surviving is developed by starting with 100% at age zero and successively multiplying the percent surviving at the beginning of each interval by the survivor ratio, i.e., one minus the retirement ratio for that age interval. The calculations necessary to determine the percent surviving at age 5½ are as follows:

Percent surviving at age 4½	=	88.15				
Exposures at age 4½	=	3,789,000				
Retirements from age 4½ to 5½	=	143,000				
Retirement Ratio	=	143,000	÷	3,789,000	=	0.0377
Survivor Ratio	=	1.000	-	0.0377	=	0.9623
Percent surviving at age 5½	=	(88.15)	x	(0.9623)	=	84.83

The totals of the exposures and retirements (columns 2 and 3) are shown for the purpose of checking with the respective totals in Tables 1 and 3. The ratio of the total retirements to the total exposures, other than for each age interval, is meaningless.

TABLE 4. ORIGINAL LIFE TABLE
CALCULATED BY THE RETIREMENT RATE METHOD

Experience Band 2001-2010 Placement Band 1996-2010

(Exposure and Retirement Amounts are in Thousands of Dollars)

Age at Beginning of Interval (1)	Exposures at Beginning of Age Interval (2)	Retirements During Age Interval (3)	Retirement Ratio (4)	Survivor Ratio (5)	Percent Surviving at Beginning of Age Interval (6)
0.0	7,490	80	0.0107	0.9893	100.00
0.5	6,579	153	0.0233	0.9767	98.93
1.5	5,719	151	0.0264	0.9736	96.62
2.5	4,955	150	0.0303	0.9697	94.07
3.5	4,332	146	0.0337	0.9663	91.22
4.5	3,789	143	0.0377	0.9623	88.15
5.5	3,057	131	0.0429	0.9571	84.83
6.5	2,463	124	0.0503	0.9497	81.19
7.5	1,952	113	0.0579	0.9421	77.11
8.5	1,503	105	0.0699	0.9301	72.65
9.5	1,097	93	0.0848	0.9152	67.57
10.5	823	83	0.1009	0.8991	61.84
11.5	531	64	0.1205	0.8795	55.60
12.5	323	44	0.1362	0.8638	48.90
13.5	167	26	0.1557	0.8443	42.24
					35.66
Total	44,780	1,606			

Column 2 from Table 3, Column 12, Plant Exposed to Retirement.
Column 3 from Table 1, Column 12, Retirements for Each Year.
Column 4 = Column 3 divided by Column 2.
Column 5 = 1.0000 minus Column 4.
Column 6 = Column 5 multiplied by Column 6 as of the Preceding Age Interval.

The original survivor curve is plotted from the original life table (column 6, Table 4). When the curve terminates at a percent surviving greater than zero, it is called a stub survivor curve. Survivor curves developed from retirement rate studies generally are stub curves.

Smoothing the Original Survivor Curve. The smoothing of the original survivor curve eliminates any irregularities and serves as the basis for the preliminary extrapolation to zero percent surviving of the original stub curve. Even if the original survivor curve is complete from 100% to zero percent, it is desirable to eliminate any irregularities as there is still an extrapolation for the vintages which have not yet lived to the age at which the curve reaches zero percent. In this study, the smoothing of the original curve with established type curves was used to eliminate irregularities in the original curve.

The Iowa type curves are used in this study to smooth those original stub curves which are expressed as percents surviving at ages in years. Each original survivor curve was compared to the Iowa curves using visual and mathematical matching in order to determine the better fitting smooth curves. In Figures 6, 7, and 8 the original curve developed in Table 4 is compared with the L, S, and R Iowa type curves which most nearly fit the original survivor curve. In Figure 6 the L1 curve with an average life between 12 and 13 years appears to be the best fit. In Figure 7 the S0 type curve with a 12-year average life appears to be the best fit and appears to be better than the L1 fitting. In Figure 8 the R1 type curve with a 12-year average life appears to be the best fit and appears to be better than either the L1 or the S0. In Figure 9 the three fittings, 12-L1, 12-S0, and 12-R1 are drawn for comparison purposes. It is probable that the 12-R1 Iowa curve would be selected as the most representative of the plotted survivor characteristics of the group, assuming no contrary relevant factors external to the analysis of historical data.

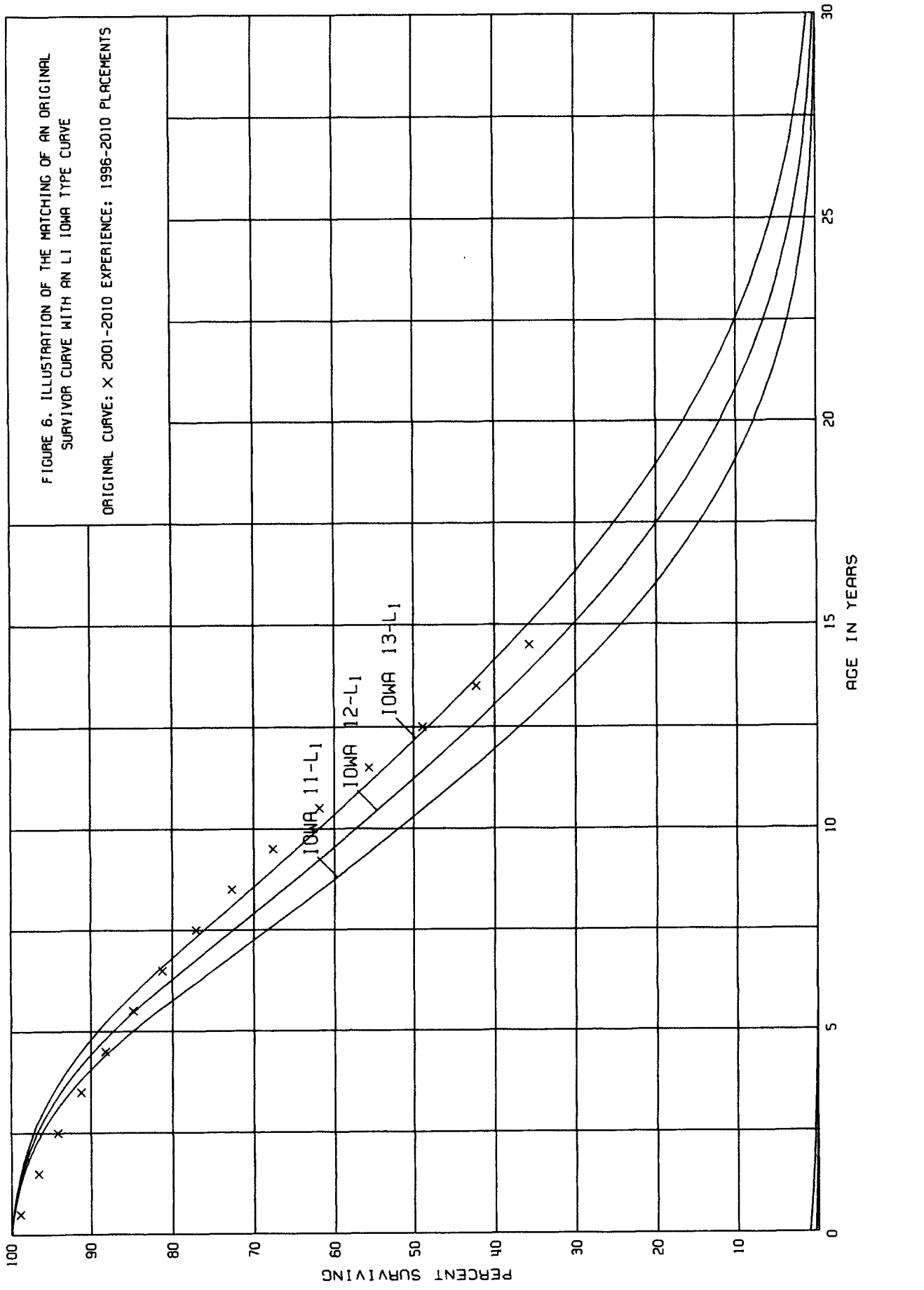
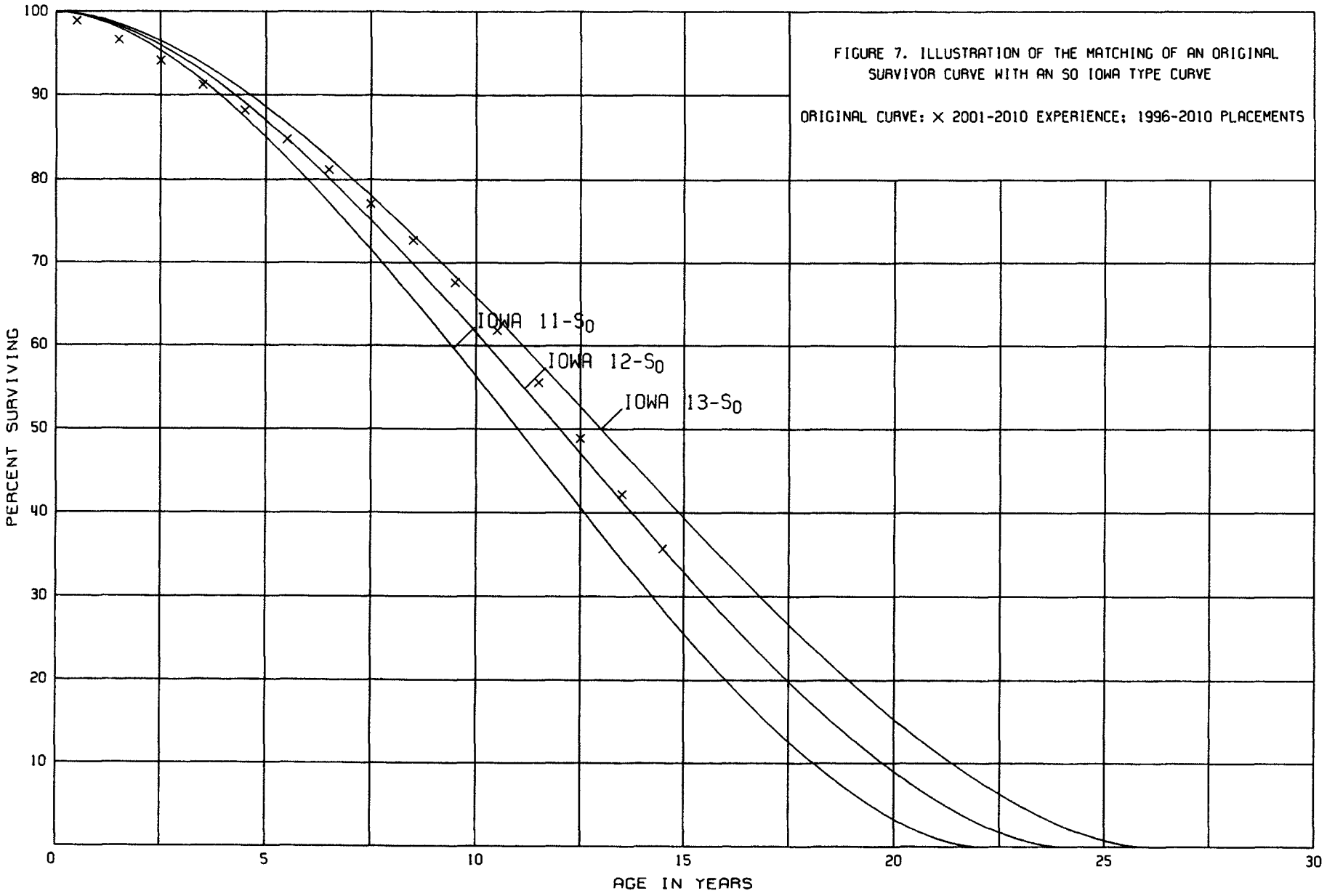
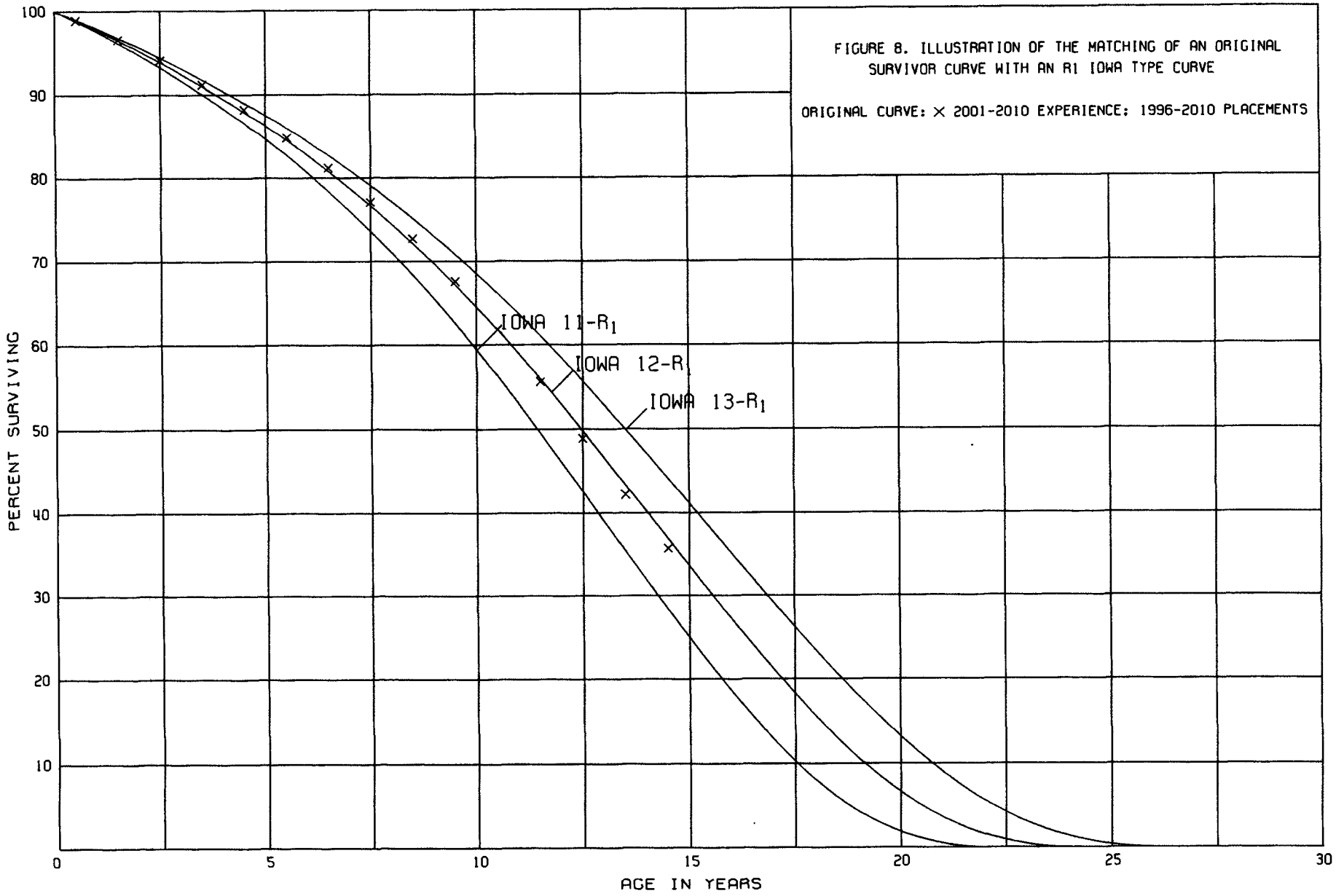


FIGURE 6. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN L1 IOWA TYPE CURVE
ORIGINAL CURVE: X 2001-2010 EXPERIENCE: 1996-2010 PLACEMENTS
IOWA 11-L1
IOWA 12-L1
IOWA 13-L1
PERCENT SURVIVING
AGE IN YEARS
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
25
30





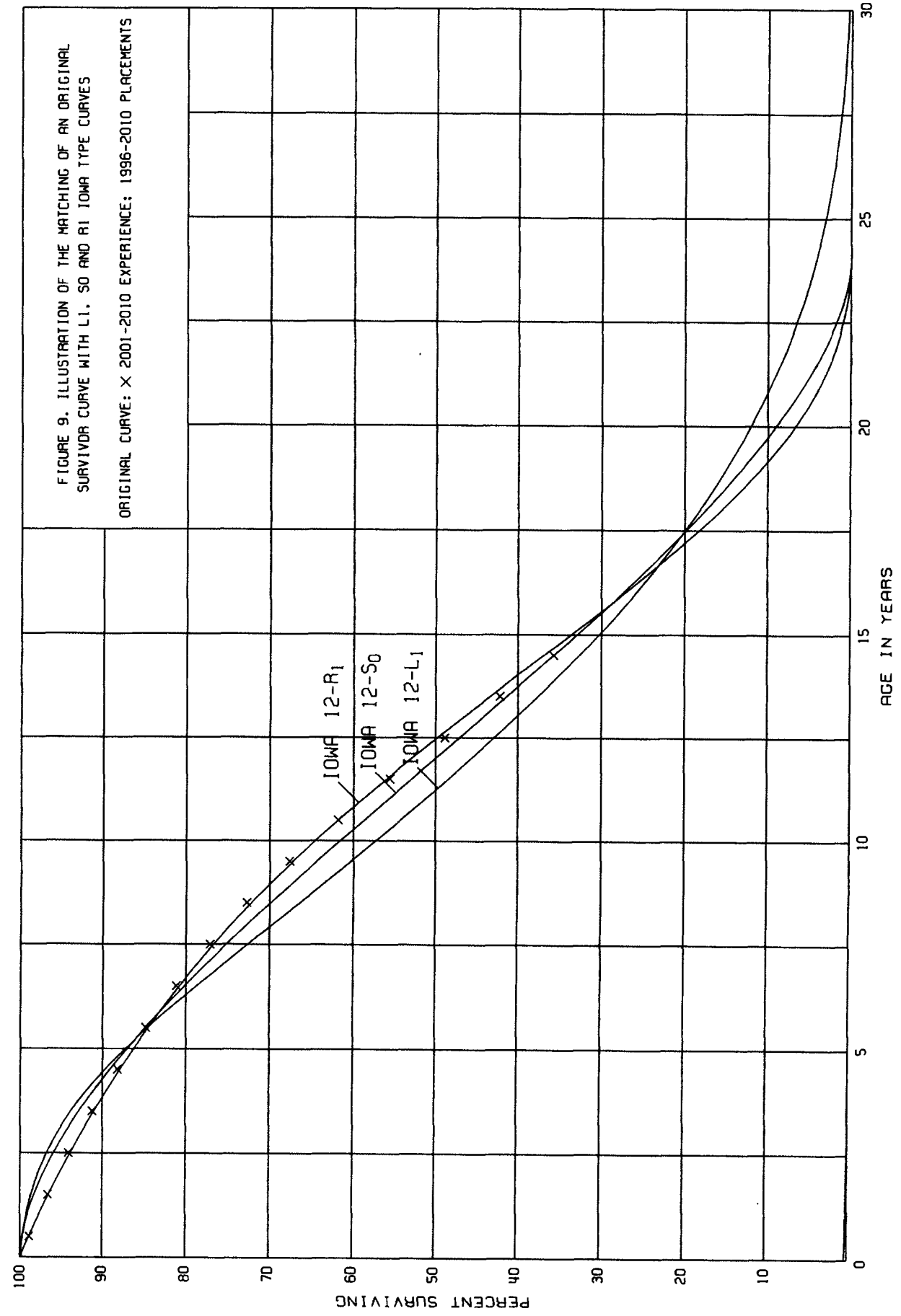


FIGURE 9. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH L1, S0 AND R1 IOWA TYPE CURVES
ORIGINAL CURVE: X 2001-2010 EXPERIENCE: 1996-2010 PLACEMENTS
IOWA 12-R1
IOWA 12-S0
IOWA 12-L1
PERCENT SURVIVING
AGE IN YEARS
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
25
30

Service Life Considerations

The service life estimates were based on judgment which considered a number of factors. The primary factors were the statistical analyses of data; current company policies and outlook as determined during field reviews of the property and other conversations with management; and the survivor curve estimates from previous studies of this company and other water companies.

For some of the plant accounts and subaccounts, the statistical analyses resulted in good to excellent indications of significant survivor patterns. Generally, the information external to the statistics led to no significant departure from the indicated survivor curves for the accounts listed below.

Account No.	Account Description
304.30	Structures and Improvements - Water Treatment
311.20	Pumping Equipment - Source of Supply and Pumping
320	Water Treatment Equipment
330	Distribution Reservoirs and Standpipes
331	Transmission and Distribution Mains
333	Services
334	Meters and Meter Installations
335	Fire Hydrants

Accounts 333.0, Services, is used to illustrate the manner in which the study was conducted for the accounts in the preceding list. Aged plant accounting data have been compiled for the years through 2010. These data have been coded according to account or property group, type of transaction, year in which the transaction took place, and year in which the utility plant was placed in service. The retirements, other plant transactions and plant additions were analyzed by the retirement rate method.

The survivor curve estimate for this account is the 27-S1.5 and is based on the statistical indication for the period 1998 through 2010. The 27-S1.5 is an excellent fit of the significant portion of the original survivor curve as set forth on page III-49, is consistent

with management outlook for a continuation of the historical experience and is within the typical service life range of 25 to 40 years for water services.

Amortization accounting is proposed for certain General Plant accounts that represent numerous units of property, but a small portion of the depreciable plant in service. These accounts represent approximately 4 percent of total utility plant. A discussion of the basis for the amortization periods is presented in the section "Calculation of Annual and Accrued Amortization".

Generally, the estimates for the remaining accounts were based on judgments which considered the nature of the plant and equipment, the previous estimate for this company and a general knowledge of service lives for similar equipment in other utility companies.

Salvage Analysis

The estimates of net salvage were based in part on historical data compiled for the years 2005 through 2010. Cost of removal and salvage were expressed as percents of the original cost of plant retired, both on annual and three-year moving average bases. The most recent five-year average also was calculated for consideration. The net salvage estimates are expressed as a percent of the original cost of plant retired.

Net Salvage Considerations

The estimates of salvage were based primarily on judgment which considered a number of factors. The primary factors were the analyses of historical data; a knowledge of management's plans and operating policies; and net salvage estimates from previous studies of this company and other water companies. The accounts for which the historical analyses were representative of expectations for future net salvage levels are presented below:

304.2	Structures and Improvements - Source of Supply and Pumping
304.3	Structures and Improvements - Water Treatment
304.5	Structures and Improvements - General
307	Wells and Springs
309	Supply Mains
341	Transportation Equipment

Account 307, Wells and Springs, is used to illustrate the manner in which the study was conducted for the accounts in the preceding list. Depreciation reserve accounting data were compiled for the years 2005 through 2010. These data include the retirements, cost of removal and gross salvage.

The net salvage estimate for this account is negative 5 percent and is based in part on the cost of removal and salvage percents shown in the tabulation on page III-75. Cost of removal as a percent of the original cost retired has been minimal during the experience as a percentage of plant retired. The overall and most recent five-year bands averaged 1 and 3 percent removal cost, respectively. Gross salvage has been zero during the six-year period. The negative 5 percent net salvage estimate is based on the overall cost of removal and gross salvage percent and the net salvage percent of other water companies.

Generally, the net salvage estimates for the remaining accounts were based on judgments which considered the nature of the plant and equipment, reviews of available historical data, and a general knowledge of net salvage percents for similar equipment in other water companies.

CALCULATION OF ANNUAL AND ACCRUED DEPRECIATION

After the survivor curve and salvage are estimated, the annual depreciation accrual rate can be calculated. In the average service life procedure, the annual accrual rate is computed by the following equation:

$$\textit{Annual Accrual Rate, Percent} = \frac{\textit{(100\% - Net Salvage, Percent)}}{\textit{Average Service Life}}.$$

The calculated accrued depreciation for each depreciable property group represents that portion of the depreciable cost of the group which will not be allocated to expense through future depreciation accruals, if current forecasts of life characteristics are used as a basis for straight line depreciation accounting.

The accrued depreciation calculation consists of applying an appropriate ratio to the surviving original cost of each vintage of each account, based upon the attained age and the estimated survivor curve. The accrued depreciation ratios are calculated as follows:

$$\textit{Ratio} = \left(1 - \frac{\textit{Average Remaining Life Expectancy}}{\textit{Average Service Life}}\right)(1 - \textit{Net Salvage, Percent}).$$

The application of these procedures is described for a single unit of property and a group of property units. Salvage is omitted from the description for ease of application.

Single Unit of Property

The calculation of straight line depreciation for a single unit of property is straightforward. For example, if a $1,000 unit of property attains an age of four years and has a life expectancy of six years, the annual accrual over the total life is:

$$\frac{\$1{,}000}{(4 + 6)} = \$100 \textit{ per year.}$$

The accrued depreciation is:

$$\$1{,}000\ (1 - \frac{6}{10}) = \$400.$$

Group Depreciation Procedures

When more than a single item of property is under consideration, a group procedure for depreciation is appropriate because normally all of the items within a group do not have identical service lives, but have lives that are dispersed over a range of time. There are two primary group procedures, namely, average service life and equal life group.

Remaining Life Annual Accruals. For the purpose of calculating remaining life accruals as of December 31, 2010, the depreciation reserve for each plant account is allocated among vintages in proportion to the calculated accrued depreciation for the account. Explanations of remaining life accruals and calculated accrued depreciation follow. The detailed calculations as of December 31, 2010, are set forth in the Results of Study section of the report.

Average Service Life Procedure. In the average service life procedure, the remaining life annual accrual for each vintage is determined by dividing future book accruals (original cost less book reserve) by the average remaining life of the vintage. The average remaining life is a directly weighted average derived from the estimated future survivor curve in accordance with the average service life procedure.

The calculated accrued depreciation for each depreciable property group represents that portion of the depreciable cost of the group which would not be allocated to expense through future depreciation accruals, if current forecasts of life characteristics are used as the basis for such accruals. The accrued depreciation calculation consists of applying an appropriate ratio to the surviving original cost of each vintage of each account, based upon

the attained age and service life. The straight line accrued depreciation ratios are calculated as follows for the average service life procedure:

$$Ratio = 1 - \frac{Average\ Remaining\ Life}{Average\ Service\ Life}.$$

CALCULATION OF ANNUAL AND ACCRUED AMORTIZATION

Amortization is the gradual extinguishment of an amount in an account by distributing such amount over a fixed period, over the life of the asset or liability to which it applies, or over the period during which it is anticipated the benefit will be realized. Normally, the distribution of the amount is in equal amounts to each year of the amortization period.

The calculation of annual and accrued amortization requires the selection of an amortization period. The amortization periods used in this report were based on judgment which incorporated a consideration of the period during which the assets will render most of their service, the amortization period and service lives used by other utilities, and the service life estimates previously used for the asset under depreciation accounting.

Amortization accounting is proposed for certain General Plant accounts that represent numerous units of property, but a very small portion of depreciable utility plant in service. The accounts and their amortization periods are as follows:

Account		Amortization Period, Years
340.00	Office Furniture and Equipment	10
343.00	Tools, Shop and Garage Equipment	20
344.00	Laboratory Equipment	15
346.00	Communication Equipment	15
347.00	Miscellaneous Equipment	15
348.00	Other Tangible Property	20

The calculated accrued amortization is equal to the original cost multiplied by the ratio of the vintage's age to its amortization period. The annual amortization amount is determined by dividing the original cost by the period of amortization for the account.

III-1

PART III. RESULTS OF STUDY