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c/o The Florida Legislature
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Room 812
Tallahassee, Florida 32399-1400
850-488-9330

December 27, 2001

CONFIDENTIAL

Ms. Blanca S. Bayó, Director
Division of the Commission Clerk
and Administrative Services
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0870

RE: Docket No. 010949-EI

Dear Ms. Bayó:

Enclosed is a copy of Direct Testimony of Michael J. Majoras containing information deemed confidential by Gulf Power Company for for filing in the above-referenced docket.

Please indicate receipt of filing by date-stamping the attached copy of this letter and returning it to this office. Thank you for your assistance in this matter.

Sincerely,

Stephen C. Burgess
Deputy Public Counsel

SCB/dsb
Enclosures 2.18.03 See DN 01629-03

DECLASSIFIED

CONFIDENTIAL

CONFIDENTIAL DN 16123-01
FILED BY OPC TO BE TREATED AS CONFIDENTIAL PENDING RECEIPT OF REQUEST FOR CONFIDENTIALITY FROM COMPANY.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DIRECT TESTIMONY OF MICHAEL J. MAJORAS
DOCKET NUMBER 010949-EI

DECEMBER 27, 2001

Respectfully submitted,

Jack Shreve
Public Counsel

Stephen C. Burgess
Deputy Public Counsel

Office of the Public Counsel
c/o The Florida Legislature
111 West Madison Street
Room 812
Tallahassee, FL 32399-1400

(850) 488-9330

Attorney for the Citizens
of the State of Florida

GULF POWER COMPANY
BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION
PREPARED DIRECT
TESTIMONY OF MICHAEL J. MAJOROS. JR.
DOCKET NO. 010949-EL

INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is Michael J. Majoros, Jr. I am Vice President of the economic consulting firm of Snavely King Majoros O'Connor & Lee, Inc. ("Snavely King"). My business address is 1220 L Street, N.W., Suite 410, Washington, D.C. 20005.

Q. PLEASE DESCRIBE SNAVELY KING.

A. Snavely King was originally founded in 1970 to conduct research on a consulting basis into the rates, revenues, costs and economic performance of regulated firms and industries. The firm has a professional staff of 10 economists, accountants, engineers and cost analysts. Most of the firm's work involves the development, preparation and presentation of expert witness testimony before Federal and State regulatory agencies. Over the course of the firm's 31-year history, its members have participated in over 500 proceedings before almost all of the state commissions and Federal commissions that regulate utilities, telecommunications companies and transportation industries.

Q. HAVE YOU PREPARED A SUMMARY OF YOUR QUALIFICATIONS AND EXPERIENCE?

A. Yes. Appendix A is a summary of my qualifications and experience. It also contains a tabulation of my appearances as an expert witness before state and Federal regulatory agencies.

Q. FOR WHOM ARE YOU APPEARING IN THIS PROCEEDING?

A. I am appearing on behalf of the Florida Office of Public Counsel ("OPC").

Q. WHAT IS THE SUBJECT OF YOUR TESTIMONY?

A. Depreciation is the subject of my testimony.

Q. DO YOU HAVE ANY SPECIFIC EXPEREINCE IN THE FIELD OF PUBLIC UTILITY DEPRECIATION?

A. Yes. I and other members of my firm are specialists in the field of public utility depreciation. We have appeared as expert witnesses on depreciation before the regulatory commission of almost every state in the country. I have testified in over 80 proceedings on the subject of public utility depreciation and represented various clients in several other proceedings in which depreciation was an issue but was settled. I have also negotiated on behalf of clients in several of the Federal Communications Commissions' ("FCC") Triennial Depreciation Represcription conferences.

Q. HAVE YOU EVER APPEARED BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION ("FPC")?

A. Yes. In the late 1980's and early 1990's I appeared on behalf of the OPC and more recently I appeared on behalf of AT&T and MCI. All of those prior appearances addressed telephone depreciation rates.

Q. DOES YOUR EXPERIENCE SPECIFICALLY INCLUDE ELECTRIC COMPANY DEPRECIATION?

A. Yes. I have testified in twenty proceedings on the subject of electric company depreciation, and I have prepared testimony in six electric proceedings in which depreciation was ultimately settled.

OBJECTIVE OF TESTIMONY

Q. WHAT IS THE OBJECTIVE OF YOUR TESTIMONY?

A. OPC requested that I review the reasonableness of Gulf Power Company's ("GPC") proposal to reduce the depreciable life for its Smith Unit 3 from 30 to 20 years. I will also provide my observations concerning certain elements in GPC's May 29, 2001 depreciation study.

SMITH UNIT 3 LIFE CHANGE

Q. PLEASE EXPLAIN GPC'S SMITH UNIT 3 LIFE CHANGE.

A. Gulf Power is constructing a new 574-megawatt (MW) combined cycle unit at Plant Smith. Smith Unit 3 is expected to begin commercial operation on or before June 1, 2002.[1] Mr. Labrato, GPC's Chief Financial Officer and Comptroller, presents GPC's financial forecast which is the basis of the projected data for the test period which in turn results in a revenue deficiency.[2] The revenue deficiency is driven primarily by the commencement of service by Smith Unit 3.

Mr. Labrato's Schedule 4 is the projected Income Statement for the Twelve Months ended May 31, 2003.[3] The totals from Schedule 4 are carried forward to Mr. Labrato's Schedule 8 which is his Summary of Net Operating Income for the Twelve Months ended Many 31, 2003. Mr. Labrato then posts adjustments to the projected figures. Adjustments 17 and 20 were made to reflect the Company's proposed depreciation rates and dismantlement accruals which were filed on May 29, 2001 in

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[1] Direct Testimony of Ronnie R. Labrato, Docket No. 010949-EL ("Labrato"), p. 4.

[2] Id., p. 2-3.

[3] Id., p. 11.

Docket No. 010789-EL.[4] According to Schedule 8 these adjustments would increase jurisdictional depreciation by $795,000.[5]

The May 29, 2001 depreciation study proposed rates based on December 31, 2001 balances, and therefore did not include Smith Unit 3 which is expected to go in-service in the Spring of 2002.[6] According to Mr. Labrato, the original forecasted depreciation expense for Smith Unit 3, included as part of his Schedule 4, was calculated using a 30-year depreciable life for Smith Unit 3.[7]

GPC now proposes to change the life from 30 to 20 years, thus increasing depreciation expense and the revenue deficiency. Subsequent to the development of its original financial forecast GPC requested an opinion from Deloitte & Touche, the firm that conducted the May 29, 2001 depreciation study. Deloitte & Touche recommended a 20-year average service life.[8] Mr. Labrato's adjustment 21 reduces NOI consistent with Deloitte & Touche's recommendation.[9] This adjustment increases jurisdictional depreciation expense by $3,383,000.[10]

Q. WHAT WAS THE BASIS FOR THE ORIGINAL 30-YEAR LIFE MR. LABRATO USED FOR SMITH UNIT 3?

A. Exhibit___(MJM-1) is Mr. Labrato's response to Citizens 1-16 which states that "Mr. Labrato chose an estimated depreciable life of 30 years for Smith Unit 3 based on

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[4] Id., p. 19.

[5] Labrato Schedule 8, page 3.

[6] Labrato, p. 20.

[7] Id.

[8] Id.

[9] Id.

[10] Labrato Schedule 8, page 3.

estimated average service lives of other combined cycle projects within Southern Company."[11]

Q. HOW DOES THIS 30-YEAR AVERAGE LIFE COMPARE TO THE AVERAGE LIVES GPC USES FOR THE OTHER UNITS AT PLANT SMITH?

A. Exhibit___(MJM-2) is a two page exhibit taken from GPC's May 29, 2001 depreciation study. These two pages summarize the Deloitte & Touche's recommendations relating to the two steam units and the existing combustion turbine at Plant Smith.

Deloitte & Touche used the life-span method to calculate the depreciation rates. The life-span method is a procedure to calculate an average service life or average remaining life based on an assumed overall life span of a unit. A life span is the period between the commencement in service and final retirement of the unit. These life spans are then weighted for piece part interim retirements to calculate average service lives or average remaining lives.

Deloitte & Touche used 50-year life spans for the Plant Smith Steam Units 1 and 2 to calculate an overall 29-year average service life. The significant difference between the 50-year life spans and the 29-year average service life results from the assumption of a substantial amount of interim retirements in the future.

Deloitte & Touche assumed a 35-year life span for the existing combustion turbine unit at Plant Smith. This unit is included in the "Other Production" function (account nos. 340-346) on GPC's books.[12] Deloitte & Touche calculated a 30-year average service life based on the 35-year life span and assumed interim retirements for

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[11] Labrato Response to Citizens' First Set of Interrogatories, Item No. 16 ("Citizens' 1-16'), attached as Exhibit___(MJM-1).

[12] Smith Unit 3 will also be recorded in Other Production function.

the combustion turbine. Hence, it is quite possible that Mr. Labrato was also aware of this 30-year average service when he originally prepared his Schedule No. 4 which included Smith Unit 3 depreciation expense based on a 30-year average service life.

Q. IS THERE OTHER EVIDENCE AVAILABLE RELATING TO THE SMITH UNIT 3 LIFE?

Confidential Information Follows

A. Yes. Exhibit___(MJM-3) is a copy of a confidential document titled Southern Company – System Design Lansing Smith Unit 3 Combined Cycle Plant Revision C." Section 2.2 addresses Design Life. Section 2.2.1 indicates that the selection of design options is based on an "economic life" of the combined cycle Plant of 20 years. However, sections 2.2.2 to 2.2.5 belie the 20-year economic life assumption. The Mechanical Design Life is typically 30-40 years, the Electrical Design Life is 30-40 years and the Civil Design Life is 30-40 years. Only Control Systems (which are subject to interim retirement) are 15-20 years. Hence, it is reasonable to assume that Southern Company would have selected a 30 year average service life from this set of Design Life specifications, just as Mr. Labrato says it does in his response to Citizens 1-16.

End of Confidential Information

Q. What is an economic life?

A. The conventional NARUC definition of economic life is the "total revenue producing life of an asset."[13] This definition would also suggest an average life of 30 to 40 years for Smith Unit 3, given the Design Life information described above. Smith Unit 3 is designed to last from 30 to 40 years and presumably will produce revenue throughout those years.

Q. AT THE BOTTOM OF HIS RESPONSE TO CITIZEN'S 1-16, MR. LABRATO STATES "HOWEVER, CONSIDERING THE FACT THAT COMBINED CYCLE UNITS ARE RELATIVELY NEW TECHNOLOGY AND THAT PERIODIC MAINTENANCE AND CAPITAL ADDITIONS ARE EXPECTED, THERE WILL BE INTERIM RETIREMENTS INDICATING A SHORTER AVERAGE LIFE." DO YOU AGREE?

A. No. Since, the 30-year life is an average life, interim retirements are already assumed in the 30-year life, just as Deloitte & Touche's 30-year life for the Other Production Function.

Q. WHAT DO YOU CONCLUDE?

A. I conclude that all available evidence within the Company supports a 30-year average service life for Smith Unit 3.[14] I also conclude that this is a minimum average service life. The Company's own design criteria suggests that an longer life could be used.

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[13] National Association of Regulatory Public Utility Commissioner's, Public Utility Depreciation Practices, August 1996 ("NARUC Manual") p. 318.

[14] For example, a 30-year average service life would assume a fairly long life-span, say 45-55 years, with a substantial amount of interim retirements.

NATIONAL LIFE STUDIES

Q. DO YOU HAVE ANY EMPIRICAL STUDIES FROM WHICH WE MAY DRAW INFERENCES CONCERNING THE REASONABLENESS OF GPC's 20-YEAR LIFE?

A. Yes. Exhibit___(MJM-4) is my firm's National Study of U.S. Steam Generating Unit lives – 50 MW and Greater ("National Study"). This study uses analytical techniques generally accepted in the utility industry and a data base maintained by the U.S. Department of Energy.[15] The study concludes that U. S. Steam Generating Units 50 MW or greater are experiencing in average life spans of approximately 55 years and that these spans are lengthening almost on a year-to-year basis.

Q. HAS YOUR FIRM ALSO CONDUCTED NATIONAL STUDIES OF OTHER PRODUCTION UNIT RETIREMENTS?

A. Yes. We have also studied national retirements of Other Production units. We employed Energy Information Administration Form 860 data from all units designated as Jet Engine (JE), Combustion Turbine (CT), Gas Turbine (GT) and Internal Combustion (IC). The following table shows the composition of the data base.

15 The study is an actuarial retirement rate analysis, using the Energy Information Agency's Form 860 database of aged generating unit retirements and exposures. A full band (1918-99) and both rolling and shrinking analyses were conducted.

	Type of Peaking Unit				TOTAL
	JE	GT	IC	CT	
Operable	129	1354	2814	107	4407
Retired	1	116	1443	0	1559
TOTAL	130	1470	4257	107	5963

These technologies are in various stages of introduction as evidenced by the virtual lack of unit retirements in the JE and CT classifications. What they have in common, however, is the way that they are used. All are used primarily to meet short-term peaks in demand. Our study is included as Exhibit___(MJM-5). It is based on a full band (1899-1996) and a shrinking band analysis, and indicates lives of approximately 45 years at a minimum which have lengthened in recent years to as long as 55 years.

Q. WHAT ARE YOUR CONCLUSIONS BASED ON YOUR NATIONAL LIFE STUDIES?

A. I conclude that the Company's original 30-year average life is far below, by 15 to 25 years, the national average of life spans being experienced by the Steam Production and Other Production Plants in the United States. I recognize that the combined cycle units are considered to be new technology. That is why it is virtually impossible to conduct a National Study of Combined Cycle retirements. Smith 3 will not be used for the peaking function normally fulfilled by the units in the Other Production function but rather it will be used primarily as a base load unit.

Nevertheless, these national studies provide a range of reasonableness for the initial life assumptions for the state-of-the-art Smith 3 combined cycle unit.

One of the incentives to construct combined cycle plants is their relatively low capital costs compared to base load steam units. An arbitrary reduction from a 30-year life to a 20-year life effectively eliminates, from the customers perspective, any capital cost advantages of combined-cycle technology.

Q. HAVE YOU CONDUCTED ANY OTHER INVESTIGATIONS OF THE SMITH UNIT 3?

A. Yes. My associate, William M. Zaetz, has substantial experience in the building and maintenance of all types of steam and other production plants. Mr. Zaetz conducted research regarding combined cycle units and actually visited Smith Unit 3. Based on his experience, research and his physical observations, Mr. Zaetz concluded that he has found nothing that would lead him to assume that Plant Smith Unit 3 would have a shorter life than the 55 years resulting from our National Study of Steam Plants 50 MW and Greater.

Q. WHAT DO YOU RECOMMEND?

A. I recommend that the Company's original 30-year average life for Smith Unit 3 be retained. It is supported by the Company's own internal studies and planning, it is consistent with the proposals in the Company's depreciation study, it is quite conservative when considered in conjunction with our National Life Studies, and it is conservative based on Mr. Zaetz's experience, research and observations. To shorten the life merely creates an artificial increase to the Company's revenue requirements. If any changes are to be made, the 30 years should be lengthened, not shortened.

MAY 29, 2001 DEPRECIATION STUDY

Q. WHAT ARE YOUR OBSERVATIONS CONCERNING GPC'S MAY 29, 2001 DEPRECIATION STUDY?

A. In general it appears that the study results in excessive depreciation for at least two reasons. First, several of the production plant life spans assumed in the study are much shorter than the life spans indicated by my National Studies. Unless the Company can support these life spans with various kinds of studies including economic analyses, the life span study:

> ... is analogous to a building which is structurally well built from the ground up but lacking in sound and proper foundation.[16]

Without this type of support, the results of my National Studies should be used. If they are, then depreciation rates will be substantially reduced.

Q. WHAT DO YOU RECOMMEND?

A. I recommend that the Commission establish a minimum 55 year life span for any steam production unit and a minimum 45 years life span for any unit to be included in the Other Production Function and require the studies identified at page 146 of the NARUC Manual for any reduction to those minimums.

Q. WHAT STUDIES DOES THE NARUC MANUAL REQUIRE?

A. The NARUC Manual requires:

- Economic studies
- Retirement plans
- Forecasts
- Studies of technological obsolescence
- Studies of adequacy of capacity

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[16] NARUC Manual, p. 146.

- Studies of competitive pressure[17]

Q. HAVE YOU REQUESTED THESE STUDIES FROM GPC?

A. Yes, I requested the studies in OPC Interrogatory 92, however, I have not received a response.

Q. HAVE YOU QUANTIFIED THE IMPACT OF THESE LONGER LIFE SPANS?

A. No. Numerous calculations are required to quantify the impact of the longer life spans. In OPC POD 60 I requested the electronic data necessary to make these calculations, but I have not received a response. Nevertheless, I believe that such an adjustment would probably result in a decrease to the existing depreciation rates. Consequently, at a minimum the Company's depreciation study increase should be disallowed.

Q. WHAT IS THE SECOND REASON THAT THE MAY 29, 2001 DEPRECIATION STUDY RESULTS IN EXCESSIVE DEPRECIATION?

A. The May 29, 2001 depreciation study results in excessive depreciation because it assumes all of its existing plants will be decommissioned and dismantled. This assumption results in current charges to consumers.[18] However, it is unlikely that decommissioning and dismantlement will occur.

Q. DO YOU HAVE ANY CORROBORATION FOR THESE OBSERVATIONS?

A. Yes. The accompanying testimony of William Zaetz describes a survey he has conducted of steam generating units that have been retired since 1982. As of this writing, Mr. Zaetz has been able to determine the present status of 81 out of the 148 steam generating units that fit this description. He reports that only 13 of these plants have been dismantled, and

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[17] Id.

[18] The current rates include $5.7 million and the proposed rates include $5.6 million of dismantling costs. See Depreciation Study, May 29, 2001 Transmittal Letter to Blanca S. Bayo.

of these only five have been returned to their original "Greenfield" condition. Sixty-eight units, or 84 percent of the retired generating units remain in place without dismantlement.

Q. WHAT DO YOU RECOMMEND?

A. I recommend that the Commission reconsider the issue of dismantlement costs to determine whether such a liability actually exists. In the meantime the $5.7 million included in current depreciation rates is excessive and provides a substantial buffer for the Company.

Q. WHAT ARE YOUR OVERALL OBSERVATIONS CONCERNING THE COMPANY'S DEPRECIATION RATES?

A. Based on Our National Studies, the Company's depreciation rates are excessive. That means that they result in excessive charges to ratepayers for existing plant. Consequently, I do not believe that the Company's need for a revenue increase is as severe as Mr. Labrato claims, and I certainly do not believe that a depreciation expense increase relating to Smith Unit 3 or any other plant is required or warranted.

Q. DOES THIS CONCLUDE YOU TESTIMONY?

A. Yes, it does.

Experience

Snavely King Majoros O'Connor & Lee, Inc.

Vice President and Treasurer (1988 to Present)
Senior Consultant (1981-1987)

Mr. Majoros provides consultation specializing in accounting, financial, and management issues. He has testified as an expert witness or negotiated on behalf of clients in more than one hundred thirty regulatory proceedings involving telephone, electric, gas, water and sewerage companies. Mr. Majoros has appeared before Federal and state agencies. His testimony has encompassed a wide variety of complex issues including taxation, divestiture accounting, revenue requirements, rate base, nuclear decommissioning, plant lives, and capital recovery. Mr. Majoros has also provided consultation to the U.S. Department of Justice.

Mr. Majoros has been responsible for developing the firm's consulting services on depreciation and other capital recovery issues into a major area of practice. He has also developed the firm's capabilities in the management audit area.

Van Scoyoc & Wiskup, Inc., *Consultant (1978-1981)*

Mr. Majoros performed various management and regulatory consulting projects in the public utility field, including preparation of electric system load projections for a group of municipally and cooperatively owned electric systems; preparation of a system of accounts and reporting of gas and oil pipelines to be used by a state regulatory commission; accounting system analysis and design for rate proceedings involving electric, gas, and telephone utilities. Mr. Majoros also assisted in an antitrust proceeding involving a major electric utility. He submitted expert testimony in FERC Docket No. RP79-12 (El Paso Natural Gas Company). In addition, he co-authored a study entitled Analysis of Staff Study on Comprehensive Tax Normalization that was submitted to FERC in Docket No. RM80-42.

Handling Equipment Sales Company, Inc., *Treasurer (1976-1978)*

Mr. Majoros' responsibilities included financial management, general accounting and reporting, and income taxes.

Ernst & Ernst, *Auditor (1973-1976)*

Mr. Majoros was a member of the audit staff where his responsibilities included auditing, supervision, business systems analysis, report preparation, and corporate income taxes.

University of Baltimore - *(1971-1973)*

Mr. Majoros was a full-time student in the School of Business. During this period Mr. Majoros worked consistently on a part-time basis in the following positions: Assistant Legislative Auditor – State of Maryland, Staff Accountant – Robert M. Carney & Co., CPA's, Staff Accountant – Naron & Wegad, CPA's, Credit Clerk – Montgomery Wards.

Central Savings Bank, *(1969-1971)*

Mr. Majoros was an Assistant Branch Manager at the time he left the bank to attend college as a full-time student. During his tenure at the bank, Mr. Majoros gained experience in each department of the bank. In addition, he attended night school at the University of Baltimore.

Education

University of Baltimore, School of Business, B.S. – Concentration in Accounting

Professional Affiliations

American Institute of Certified Public Accountants
Maryland Association of C.P.A.s
Society of Depreciation Professionals

Publications, Papers, and Panels

"Analysis of Staff Study on Comprehensive Tax Normalization," FERC Docket No. RM 80-42, 1980.

"Telephone Company Deferred Taxes and Investment Tax Credits – A Capital Loss for Ratepayers," Public Utility Fortnightly, September 27, 1984.

"The Use of Customer Discount Rates in Revenue Requirement Comparisons," Proceedings of the 25th Annual Iowa State Regulatory Conference, 1986

"The Regulatory Dilemma Created By Emerging Revenue Streams of Independent Telephone Companies," Proceedings of NARUC 101st Annual Convention and Regulatory Symposium, 1989.

"BOC Depreciation Issues in the States," National Association of State Utility Consumer Advocates, 1990 Mid-Year Meeting, 1990.

"Current Issues in Capital Recovery" 30th Annual Iowa State Regulatory Conference, 1991.

"Impaired Assets Under SFAS No. 121," National Association of State Utility consumer Advocates, 1996 Mid-Year Meeting, 1996.

"What's 'Sunk' Ain't Stranded: Why Excessive Utility Depreciation is Avoidable," with James Campbell, Public Utilities Fortnightly, April 1, 1999.

Michael J. Majoros, Jr.

Federal Regulatory Agencies

Date	Agency	Docket	Utility
1979	FERC-US 19/	RR79-12	El Paso Natural Gas Co.
1980	FERC-US 19/	RM80-42	Generic Tax Normalization
1996	CRTC-Canada 30/	97-9	All Canadian Telecoms
1997	CRTC-Canada 31/	97-11	All Canadian Telecoms
1999	FCC 32/	98-137 (Ex Parte)	All LECs
1999	FCC 32/	98-91 (Ex Parte)	All LECs
1999	FCC 32/	98-177 (Ex Parte)	All LECs
1999	FCC 32/	98-45 (Ex Parte)	All LECs
2000	EPA 35/	CAA-00-6	Tennessee Valley Authority

State Regulatory Agencies

1982	Massachusetts 17/	DPU 557/558	Western Mass Elec. Co.
1982	Illinois 16/	ICC81-8115	Illinois Bell Telephone Co.
1983	Maryland 8/	7574-Direct	Baltimore Gas & Electric Co.
1983	Maryland 8/	7574-Surrebuttal	Baltimore Gas & Electric Co.
1983	Connecticut 15/	810911	Woodlake Water Co.
1983	New Jersey 1/	815-458	New Jersey Bell Tel. Co.
1983	New Jersey 14/	8011-827	Atlantic City Sewerage Co.
1984	Dist. Of Columbia 7/	785	Potomac Electric Power Co.
1984	Maryland 8/	7689	Washington Gas Light Co.
1984	Dist. Of Columbia 7/	798	C&P Tel. Co.
1984	Pennsylvania 13/	R-832316	Bell Telephone Co. of PA
1984	New Mexico 12/	1032	Mt. States Tel. & Telegraph
1984	Idaho 18/	U-1000-70	Mt. States Tel. & Telegraph
1984	Colorado 11/	1655	Mt. States Tel. & Telegraph
1984	Dist. Of Columbia 7/	813	Potomac Electric Power Co.
1984	Pennsylvania 3/	R842621-R842625	Western Pa. Water Co.
1985	Maryland 8/	7743	Potomac Electric Power Co.
1985	New Jersey 1/	848-856	New Jersey Bell Tel. Co.
1985	Maryland 8/	7851	C&P Tel. Co.
1985	California 10/	I-85-03-78	Pacific Bell Telephone Co.
1985	Pennsylvania 3/	R-850174	Phila. Surban Water Co.
1985	Pennsylvania 3/	R850178	Pennsylvania Gas & Water Co.
1985	Pennsylvania 3/	R-850299	General Tel. Co. of PA
1986	Maryland 8/	7899	Delmarva Power & Light Co.
1986	Maryland 8/	7754	Chesapeake Utilities Corp.
1986	Pennsylvania 3/	R-850268	York Water Co.
1986	Maryland 8/	7953	Southern Md. Electric Corp.
1986	Idaho 9/	U-1002-59	General Tel. Of the Northwest

Michael J. Majoros, Jr.

1986	Maryland 8/	7973	Baltimore Gas & Electric Co.
1987	Pennsylvania 3/	R-860350	Dauphin Cons. Water Supply
1987	Pennsylvania 3/	C-860923	Bell Telephone Co. of PA
1987	Iowa 6/	DPU-86-2	Northwestern Bell Tel. Co.
1987	Dist. Of Columbia 7/	842	Washington Gas Light Co.
1988	Florida 4/	880069-TL	Southern Bell Telephone
1988	Iowa 6/	RPU-87-3	Iowa Public Service Company
1988	Iowa 6/	RPU-87-6	Northwestern Bell Tel. Co.
1988	Dist. Of Columbia 7/	869	Potomac Electric Power Co.
1989	Iowa 6/	RPU-88-6	Northwestern Bell Tel. Co.
1990	New Jersey 1/	1487-88	Morris City Transfer Station
1990	New Jersey 5/	WR 88-80967	Toms River Water Company
1990	Florida 4/	890256-TL	Southern Bell Company
1990	New Jersey 1/	ER89110912J	Jersey Central Power & Light
1990	New Jersey 1/	WR90050497J	Elizabethtown Water Co.
1991	Pennsylvania 3/	P900465	United Tel. Co. of Pa.
1991	West Virginia 2/	90-564-T-D	C&P Telephone Co.
1991	New Jersey 1/	90080792J	Hackensack Water Co.
1991	New Jersey 1/	WR90080884J	Middlesex Water Co.
1991	Pennsylvania 3/	R-911892	Phil. Suburban Water Co.
1991	Kansas 20/	176, 716-U	Kansas Power & Light Co.
1991	Indiana 29/	39017	Indiana Bell Telephone
1991	Nevada 21/	91-5054	Central Tele. Co. – Nevada
1992	New Jersey 1/	EE91081428	Public Service Electric & Gas
1992	Maryland 8/	8462	C&P Telephone Co.
1992	West Virginia 2/	91-1037-E-D	Appalachian Power Co.
1993	Maryland 8/	8464	Potomac Electric Power Co.
1993	South Carolina 22/	92-227-C	Southern Bell Telephone
1993	Maryland 8/	8485	Baltimore Gas & Electric Co.
1993	Georgia 23/	4451-U	Atlanta Gas Light Co.
1993	New Jersey 1/	GR93040114	New Jersey Natural Gas. Co.
1994	Iowa 6/	RPU-93-9	U.S. West – Iowa
1994	Iowa 6/	RPU-94-3	Midwest Gas
1995	Delaware 24/	94-149	Wilm. Suburban Water Corp.
1995	Connecticut 25/	94-10-03	So. New England Telephone
1995	Connecticut 25/	95-03-01	So. New England Telephone
1995	Pennsylvania 3/	R-00953300	Citizens Utilities Company
1995	Georgia 23/	5503-0	Southern Bell
1996	Maryland 8/	8715	Bell Atlantic
1996	Arizona 26/	E-1032-95-417	Citizens Utilities Company
1996	New Hampshire 27/	DE 96-252	New England Telephone
1997	Iowa 6/	DPU-96-1	U S West – Iowa
1997	Ohio 28/	96-922-TP-UNC	Ameritech – Ohio
1997	Michigan 28/	U-11280	Ameritech – Michigan

Michael J. Majoros, Jr.

1997	Michigan 28/	U-112 81	GTE North
1997	Wyoming 27/	7000-ztr-96-323	US West – Wyoming
1997	Iowa 6/	RPU-96-9	US West – Iowa
1997	Illinois 28/	96-0486-0569	Ameritech – Illinois
1997	Indiana 28/	40611	Ameritech – Indiana
1997	Indiana 27/	40734	GTE North
1997	Utah 27/	97-049-08	US West – Utah
1997	Georgia 28/	7061-U	BellSouth – Georgia
1997	Connecticut 25/	96-04-07	So. New England Telephone
1998	Florida 28/	960833-TP et. al.	BellSouth – Florida
1998	Illinois 27/	97-0355	GTE North/South
1998	Michigan 33/	U-11726	Detroit Edison
1999	Maryland 8/	8794	Baltimore Gas & Electric Co.
1999	Maryland 8/	8795	Delmarva Power & Light Co.
1999	Maryland 8/	8797	Potomac Edison Company
1999	West Virginia 2/	98-0452-E-GI	Electric Restructuring
1999	Delaware 24/	98-98	United Water Company
1999	Pennsylvania 3/	R-00994638	Pennsylvania American Water
1999	West Virginia 2/	98-0985-W-D	West Virginia American Water
1999	Michigan 33/	U-11495	Detroit Edison
2000	Delaware 24/	99-466	Tidewater Utilities
2000	New Mexico 34/	3008	US WEST Communications, Inc.
2000	Florida 28/	990649-TP	BellSouth -Florida
2000	New Jersey 1/	WR30174	Consumer New Jersey Water
2000	Pennsylvania 3/	R-0005212	Pennsylvania American Sewerage
2000	Connecticut 25/	00-07-17	Southern New England Telephone
2001	Kentucky 36/	2000-373	Jackson Energy Cooperative
2001	Kansas 38/39/40/	01-WSRE-436-RTS	Western Resources
2001	South Carolina 22/	2001-93-E	Carolina Power & Light Co.
2001	North Dakota 37/	PU-400-00-521	Northern States Power/Xcel Energy
2001	Indiana 29/41/	41746	Northern Indiana Power Company
2001	New Jersey 1/	GR01050328	Public Service Electric and Gas
2001	Pennsylvania 3/	R-00016236	York Water Company
2001	Pennsylvania 3/	R-00016339	Pennsylvania America Water
2001	Pennsylvania 3/	R-00016356	Wellsboro Electric Coop.

Michael J. Majoros, Jr.

PARTICIPATION AS NEGOTIATOR IN FCC DEPRECIATION RATE REPRESCRIPTION CONFERENCES

COMPANY	YEARS	CLIENT
Diamond State Telephone Co. 24/	1985 + 1988	Delaware Public Service Comm
Bell Telephone of Pennsylvania 3/	1986 + 1989	PA Consumer Advocate
Chesapeake & Potomac Telephone Co. - Md. 8/	1986	Maryland People's Counsel
Southwestern Bell Telephone – Kansas 20/	1986	Kansas Corp. Commission
Southern Bell – Florida 4/	1986	Florida Consumer Advocate
Chesapeake & Potomac Telephone Co.-W.Va. 2/	1987 + 1990	West VA Consumer Advocate
New Jersey Bell Telephone Co. 1/	1985 + 1988	New Jersey Rate Counsel
Southern Bell - South Carolina 22/	1986 + 1989 + 1992	S. Carolina Consumer Advocate
GTE-North – Pennsylvania 3/	1989	PA Consumer Advocate

Michael J. Majoros, Jr.

PARTICIPATION IN PROCEEDINGS WHICH WERE SETTLED BEFORE TESTIMONY WAS SUBMITTED

STATE	DOCKET NO.	UTILITY
Maryland 8/	7878	Potomac Edison
Nevada 21/	88-728	Southwest Gas
New Jersey 1/	WR90090950J	New Jersey American Water
New Jersey 1/	WR900050497J	Elizabethtown Water
New Jersey 1/	WR91091483	Garden State Water
West Virginia 2/	91-1037-E	Appalachian Power Co.
Nevada 21/	92-7002	Central Telephone - Nevada
Pennsylvania 3/	R-00932873	Blue Mountain Water
West Virginia 2/	93-1165-E-D	Potomac Edison
West Virginia 2/	94-0013-E-D	Monongahela Power
New Jersey 1/	WR94030059	New Jersey American Water
New Jersey 1/	WR95080346	Elizabethtown Water
New Jersey 1/	WR95050219	Toms River Water Co.
Maryland 8/	8796	Potomac Electric Power Co.
South Carolina 22/	1999-077-E	Carolina Power & Light Co.
South Carolina 22/	1999-072-E	Carolina Power & Light Co.
Pennsylvania 3/	R-0016236	The York Water Company
Kentucky 36/	2001-104 & 141	Kentucky Utilities, Louisville Gas and Electric

Michael J. Majoros, Jr.

Clients

1/ New Jersey Rate Counsel/Advocate
2/ West Virginia Consumer Advocate
3/ Pennsylvania OCA
4/ Florida Office of Public Advocate
5/ Toms River Fire Commissioner's
6/ Iowa Office of Consumer Advocate
7/ D.C. People's Counsel
8/ Maryland's People's Counsel
9/ Idaho Public Service Commission
10/ Western Burglar and Fire Alarm
11/ U.S. Dept. of Defense
12/ N.M. State Corporation Comm.
13/ City of Philadelphia
14/ Resorts International
15/ Woodlake Condominium Association
16/ Illinois Attorney General
17/ Mass Coalition of Municipalities
18/ U.S. Department of Energy
19/ Arizona Electric Power Corp.
20/ Kansas Corporation Commission
21/ Public Service Comm. – Nevada
22/ SC Dept. of Consumer Affairs
23/ Georgia Public Service Comm.
24/ Delaware Public Service Comm.
25/ Conn. Ofc. Of Consumer Counsel
26/ Arizona Corp. Commission
27/ AT&T
28/ AT&T/MCI
29/ IN Office of Utility Consumer Counselor
30/ Unitel (AT&T – Canada)
31/ Public Interest Advocacy Centre
32/ U.S. General Services Administration
33/ Michigan Attorney General
34/ New Mexico Attorney General
35/ Environmental Protection Agency Enforcement Staff
36/ Kentucky Attorney General
37/ North Dakota Public Service Commission
38/ Kansas Industrial Group
39/ City of Witchita
40/ Kansas Citizens' Utility Rate Board
41/ NIPSCO Industrial Group

16. Smith Unit 3. Mr. Labrato states on page 20 that forecasted depreciation expense "was calculated assuming a depreciable life for Smith Unit 3 of 30 years." Explain what the basis was for this assumption and who made the initial determination to use 30 years.

ANSWER:

At the time the forecast was developed for the test year, Mr. Labrato chose an estimated depreciable life of 30 years for Smith Unit 3 based on estimated average service lives of other combined cycle projects within Southern Company. Since combined cycle technology is relatively new to the Southern electric system, a depreciation study which includes combined cycle units has not been performed by any of the operating companies at this time. For planning purposes, most companies have assumed a life of approximately 30 years. However, considering that combined cycle units are relatively new technology and that periodic maintenance and capital additions are expected, there will be interim retirements indicating a shorter average life.

ANALYSIS RESULTS
Depreciable Property

Plant Smith						
Item				1997 FPSC	Est. 2001	Change
Total Investment				105,150,825	115,890,000	10,739,175
Retirement Dates:						
Unit	MW	Fuel Type	In-Serv.			
1	125	Coal	1965	2015	2015	
2	180	Coal	1967	2017	2017	
Life Span (Years):						
Unit 1				50	50	
Unit 2				50	50	
Common				52	52	
Study Method/Dispersion				Forecast	Forecast	
Average Service Life				32	29	
Theoretical Reserve				53,501,785	65,820,138	12,318,353
Book Reserve (excl dismantlement)				53,868,085	66,104,000	12,235,915
Reserve Variance				366,300	283,862	(82,438)
Book Reserve Ratio				51.23%	57.04%	
Gross Salvage				1%	1%	
Removal Cost excl Dismantlement				5%	4%	
Net Removal Cost				4%	3%	
				Current (SL)	Est. 2001	
Annual Dismantlement				1,208,663	1,240,212	31,549
Avg Whole Life Rate				3.3%	3.6%	
AWL 2001 Expense excl Dismantlement				3,469,977	4,172,040	702,063
Average Remaining Life				16.6	14.0	
ARL Rate				3.2%	3.3%	
ARL 2001 Expense excl Dismantlement				3,708,480	3,824,370	115,890

The Average Remaining Life for Plant Smith needs to be adjusted to reflect the time remaining from 12/31/01 through the retirement date of each generating unit. The proposed ARL is a weighted average of all of Plant Smith's generating units adjusted for the effect of interim retirements (stratification).

ANALYSIS RESULTS
Depreciable Property

Plant Smith Combustion Turbine						
Item				97 FPSC	Est. 2001	Change
Total Investment				4,251,269	4,341,531	90,262
Retirement Dates:						
Unit	MW	Fuel Type	In-Serv.			
A	40	Nat. Gas	1971	2006	2006	
Life Span (Years):						
Unit 1				35	35	
Study Method/Dispersion				Forecast	Forecast	
Average Service Life				32	30	
Theoretical Reserve				3,112,893	3,681,087	568,194
Book Reserve (excl dismantlement)				3,971,375	4,166,000	194,625
Reserve Variance				858,482	484,913	(373,569)
Book Reserve Ratio				93.42%	95.96%	
Gross Salvage				0%	0%	
Removal Cost excl Dismantlement				0%	0%	
Net Removal Cost				0%	0%	
				Current (SL)	Est. 2001	
Annual Dismantlement				9,845	11,259	1,414
Avg Whole Life Rate				3.1%	3.3%	
AWL 2001 Expense excl Dismantlement				131,789	143,271	11,482
Average Remaining Life				8.5	4.5	
ARL Rate				0.8%	0.9%	
ARL 2001 Expense excl Dismantlement				34,732	39,074	4,342

CONFIDENTIAL

Southern Company

System Design Lansing Smith Unit 3

Revision C

2.1.10 The steam turbine generator assembly will be installed outdoors on an elevated concrete pedestal. The layout is arranged for proper operation and maintenance access.

2.1.11 The CCP will not operate in the typical simple cycle mode, i.e. no CT exhaust bypass stack is included. However, the CT can operate simple cycle, independent of the steam turbine, with the steam generated being directed to the condenser through the steam bypass systems. Operation in this mode would occur only during startup and during emergency operation. There is a significant heat rate penalty when operating in this mode.

2.2 DESIGN LIFE

2.2.1 The selection of design options is based on an economic life of the Combined Cycle Plant of 20 years.

2.2.2 Mechanical Design Life-Typically 30-40 years

2.2.3 Electrical Design Life-Typically 30-40 years

2.2.4 Control systems- Typically 15-20 years

2.2.5 Civil Design Life- Typically 30-40 years

2.3 ENVIRONMENTAL CRITERIA

2.3.1 The unit is designed to operate satisfactorily in the ambient temperature range between 0° F and 105° F and for humidity ranging from 30% to 100%. All equipment is either designed for outdoor service or provided with an enclosure.

2.3.2 Where enclosures are provided, adequate heating and either air conditioning or ventilation will be provided. Insulation (no asbestos) and fire protection of the enclosures will also be provided.

2.3.3 Wind and seismic requirements are as described in ASCE 7-95.

2.3.4 Environmental restrictions for the plant are as described in the separate section entitled" Unit Operational Requirements" (SECTION I) of this manual.

**Snavely King Majoros O'Connor & Lee, Inc.
National Study of U.S. Steam Generating Unit Lives
50 MW and Greater**

Snavely King Majoros O'Connor & Lee, Inc. ("Snavely King") performed a study of U.S. Steam Generating Units Lives, 50 MW and Greater using analytical techniques generally accepted in the utility industry and a database maintained by the U.S. Department of Energy ("DOE"). Snavely King concludes that the lives of the U.S. Steam Generating Units (50 MW and Greater) are experiencing average life spans of approximately 55 years and these spans are lengthening almost on a year-to-year basis.

Database

The DOE's Energy Information Administration ("EIA") requires every owner of an electric utility generating plant to file a Form 860 describing the status of its generating facilities. From these reports, EIA maintains data on the installation and retirements of generating units around the country.

The data utilized in this study is available on the EIA's web site. The primary data used in Snavely King's study is located in the Form 860-A database files. The Form 860-B data is also used to check the current status of units that have been sold to Non-Utility Generators ("NUG's"). The data was downloaded in several steps into a single Microsoft Access file and developed into inputs for Snavely King's actuarial analysis program.

Various sorts were made to refine the data and to remove bad data. For example, plant with in-service dates of 1900 apparently had a Y2K problem. Some units listed as retired had no retirement dates indicated, etc.

Analysis

Snavely King initially performed an analysis of the full band (1918-1999) and the most recent ten-year band (1990-1999) of data. The full band analysis had a best fit result of 54 L4, which indicates a 54-year life (See Schedule 1). The ten-year band best fit was a 59 L4, which indicates a 59-year life (See Schedule 2). This indicated that life spans for generating units are increasing, probably due to life-extension programs, and called for further analysis. Hence, additional analyses were performed: an expanded full band analysis, rolling band analysis and a shrinking band analysis. The results are discussed and set forth in tabular form below and displayed on life indication chart son Schedule 3.

Expanded Full Band Analysis

The expanded full band analysis held the initial year constant but cut-off dates of 1998, 1997, 1996 and 1995. The actuarial analyses yielded the following results.

Expanded Full Band Analysis		
Band	Life	Curve Type
1918-99	54	L4
1918-98	53	L4
1918-97	52	L5
1918-96	51	L5
1918-95	50	L5

The results indicate that large generating units are being kept operational longer.

Rolling Band Analysis

The ten-year band analyses for these data sets provided a "rolling band" analysis. The results are summarized in the table below.

Band	Life	Curve Type
1990-99	59	L4
1989-98	59	L4
1988-97	55	L5
1987-96	55	L4
1986-95	53	L5

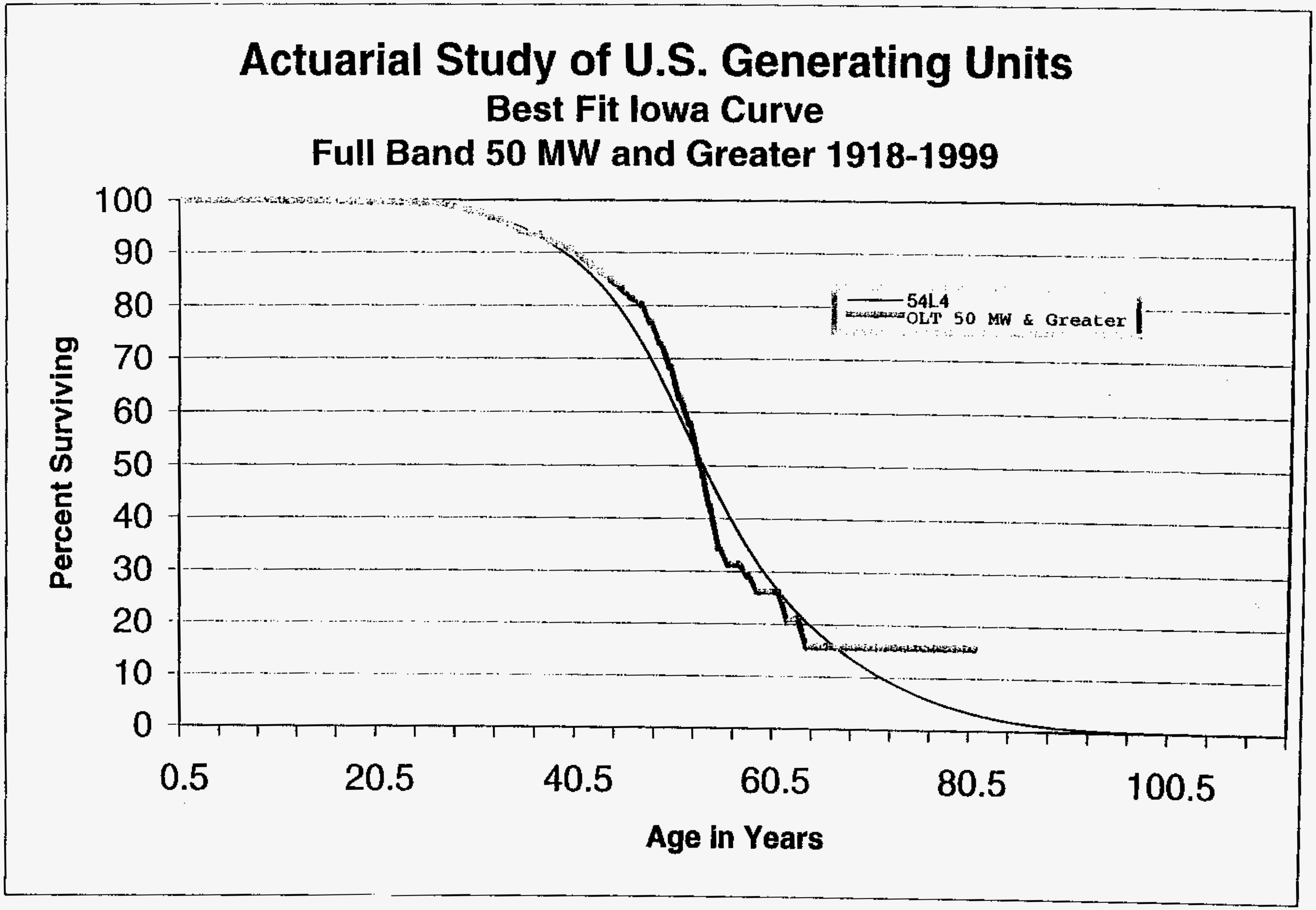
This indicates a similar rapid increase in lives of generating units probably coincident with the wide spread introduction of life extension programs and the reduction in investment by utilities in new base load generating units.

Shrinking Band Analysis

Finally, Snavely King did a "shrinking band" analysis, in which the final 1999 year was held constant and the bands were continually shrunk.

Band	Width	Life	Curve Type	Note
1995-99	5 years	69	S3	70 L3 very close
1994-00	6 years	70	L3	66 S3 very close
1993-99	7 years	63	L4	
1992-99	8 years	61	S3	
1991-99	9 years	60	L4	
1990-99	10 years	59	L4	
1985-99	15 years	59	L4	
1980-99	20 years	55	L4	
1975-99	25 years	54	L4	

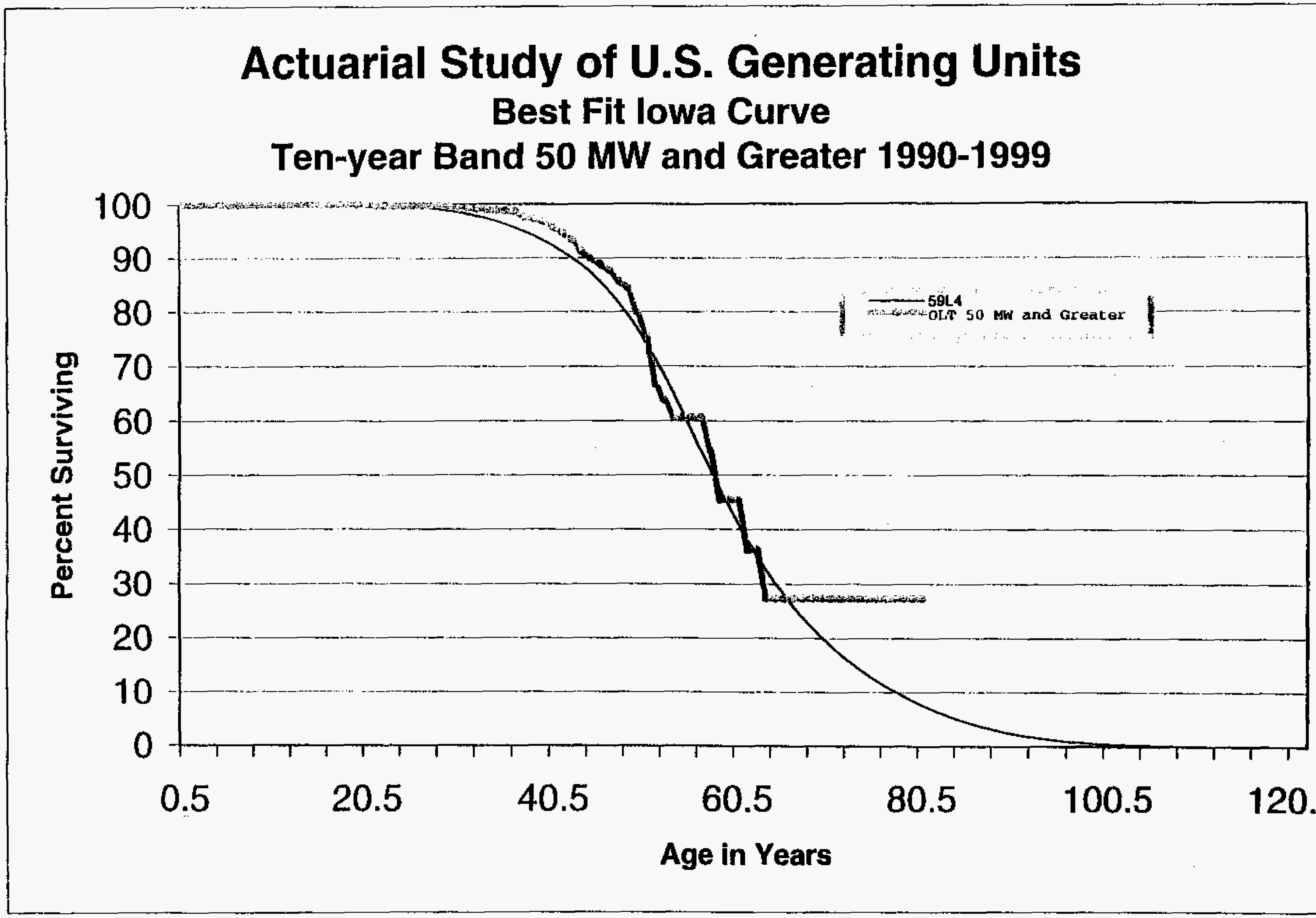
The shrinking band analysis corroborated earlier results and conclusions. The average life span of steam units 50 MW and Greater is currently in the 55-year range and is getting longer.



Actuarial Study of U.S. Generating Units
Best Fit Iowa Curve
Full Band 50 MW and Greater 1918-1999
100
90
80
70
60
50
40
30
20
10
0
Percent Surviving
54L4
OLT 50 MW & Greater
0.5
20.5
40.5
60.5
80.5
100.5
Age in Years

qqvqai ACTUARIAL ANALYSIS
CURVE FITTING RESULTS
ACCOUNT: 201999
BAND: 1918,1999

RANK	IOWA CURVE	AVERAGE SERVICE LIFE	SUM OF SQUARED DEVIATIONS
1	L4	54.00	631.43
2	S4	53.00	992.53
3	L5	53.00	1072.53
4	R4	52.00	1315.38
5	S3	53.00	1664.15
6	R5	53.00	2565.56
7	R3	52.00	2708.33
8	S5	53.00	3018.70
9	L3	56.00	3583.41
10	S2	53.00	4471.72
11	R2.5	52.00	4655.86
12	S1.5	53.00	6613.60
13	S6	53.00	6659.24
14	R2	51.00	7514.97
15	L2	57.00	8781.34
16	S1	54.00	9335.79
17	R1.5	52.00	10980.60
18	L1.5	58.00	11987.78
19	S0.5	54.00	12350.24
20	R1	52.00	15276.46
21	L1	59.00	15922.97
22	S0	55.00	15942.46
23	L0.5	61.00	19090.42
24	SQ	53.00	20062.34
25	R0.5	54.00	20559.11
26	S-0.5	56.00	20615.37
27	L0	64.00	22638.36
28	O1	58.00	26015.32
29	O2	66.00	26081.86
30	O3	80.00	31454.13
31	O4	80.00	45976.49


Actuarial Study of U.S. Generating Units
Best Fit Iowa Curve
Ten-year Band 50 MW and Greater 1990-1999
59L4
OLT 50 MW and Greater
Percent Surviving
100
90
80
70
60
50
40
30
20
10
0
0.5
20.5
40.5
60.5
80.5
100.5
120.5
Age in Years

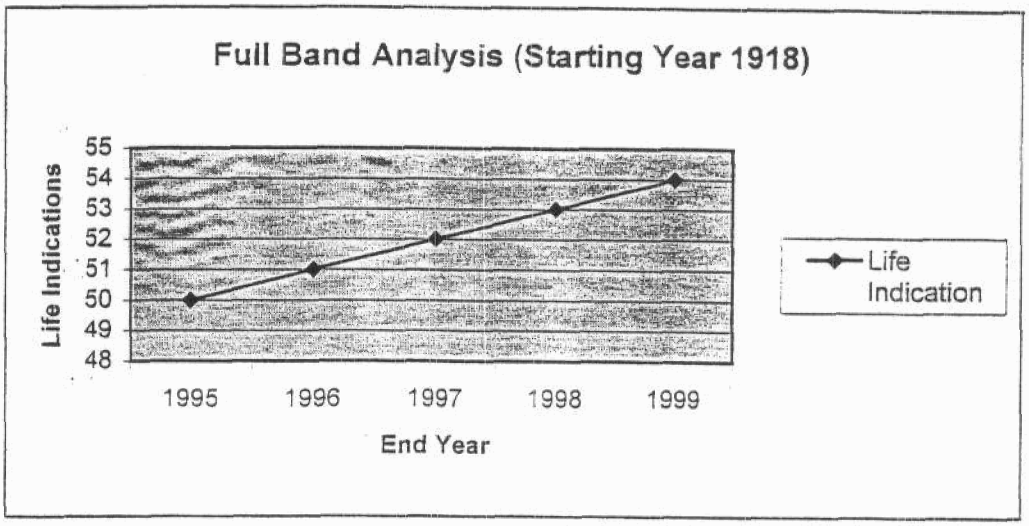
qqvqal ACTUARIAL ANALYSIS
CURVE FITTING RESULTS
ACCOUNT: 201999
BAND: 1990,1999

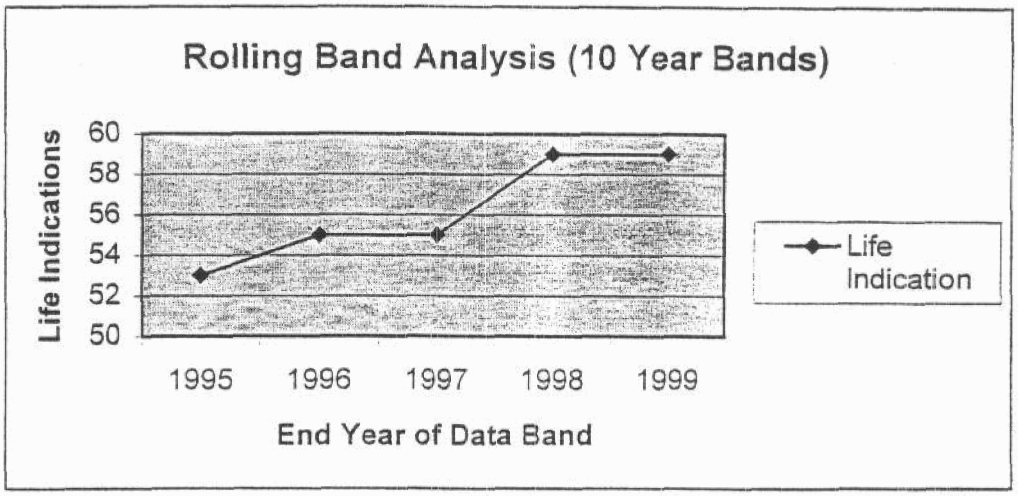
RANK	IOWA CURVE	AVERAGE SERVICE LIFE	SUM OF SQUARED DEVIATIONS
1	L4	59.00	461.54
2	S4	58.00	724.77
3	R4	58.00	976.26
4	S3	59.00	1073.69
5	L5	59.00	1435.81
6	L3	62.00	2094.16
7	R3	58.00	2415.24
8	R5	58.00	2595.41
9	S2	60.00	3390.06
10	S5	58.00	3505.83
11	R2.5	58.00	4216.59
12	S1.5	61.00	5171.71
13	L2	66.00	5918.36
14	R2	58.00	6708.60
15	S1	62.00	7313.08
16	L1.5	68.00	8531.20
17	S6	56.00	8962.03
18	R1.5	60.00	9704.19
19	S0.5	64.00	9748.55
20	L1	72.00	11492.93
21	S0	66.00	12451.65
22	R1	62.00	13128.24
23	L0.5	76.00	13993.35
24	S-0.5	70.00	16066.46
25	L0	80.00	16692.33
26	R0.5	67.00	16884.38
27	O1	78.00	19847.31
28	O2	80.00	20288.43
29	SQ	56.00	25696.77
30	O3	80.00	32953.72
31	O4	80.00	55620.06

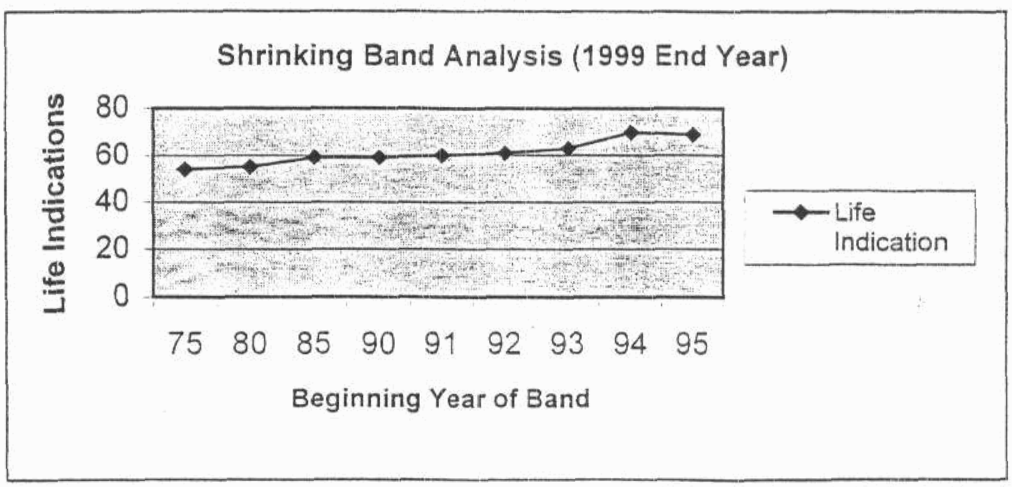
Snavely King Majoros O'Connor Lee, Inc.

U.S. Steam Generating Plant Life Study
(50 MW and Greater)

Actuarial Life Indications*







* Based on Retirement Rate Analysis using EIA Form 860-A data band and Snavely King's Acturial Analysis Program.

Snavely King Majoros O'Connor & Lee, Inc.
National Study of U.S. Other Production Unit Lives

Snavely King Majoros O'Connor & Lee, Inc. ("Snavely King") performed a study of U.S. Other Production Units Lives using analytical techniques generally accepted in the utility industry and a database maintained by the U.S. Department of Energy ("DOE"). Snavely King concludes that U.S. Other Production Units are experiencing average life spans of approximately 45.5 years at a minimum, and that these spans have lengthened in recent years to as long as 55 years.

Database

The DOE's Energy Information Administration ("EIA") requires every owner of an electric utility generating plant to file a Form 860 describing the status of its generating facilities. From these reports, EIA maintains data on the installation and retirements of generating units around the country.

The data utilized in this study is available on the EIA's web site. The primary data used in Snavely King's study is located in the Form 860-A database files. The Form 860-B data is also used to check the current status of units that have been sold to Non-Utility Generators ("NUG's"). The data was downloaded in several steps into a single Microsoft Access file and developed into inputs for Snavely King's actuarial analysis program.

Various sorts were made to refine the data and to remove bad data. For example, plant with in-service dates of 1900 apparently had a Y2K problem. Some units listed as retired had no retirement dates indicated, etc.

Analysis

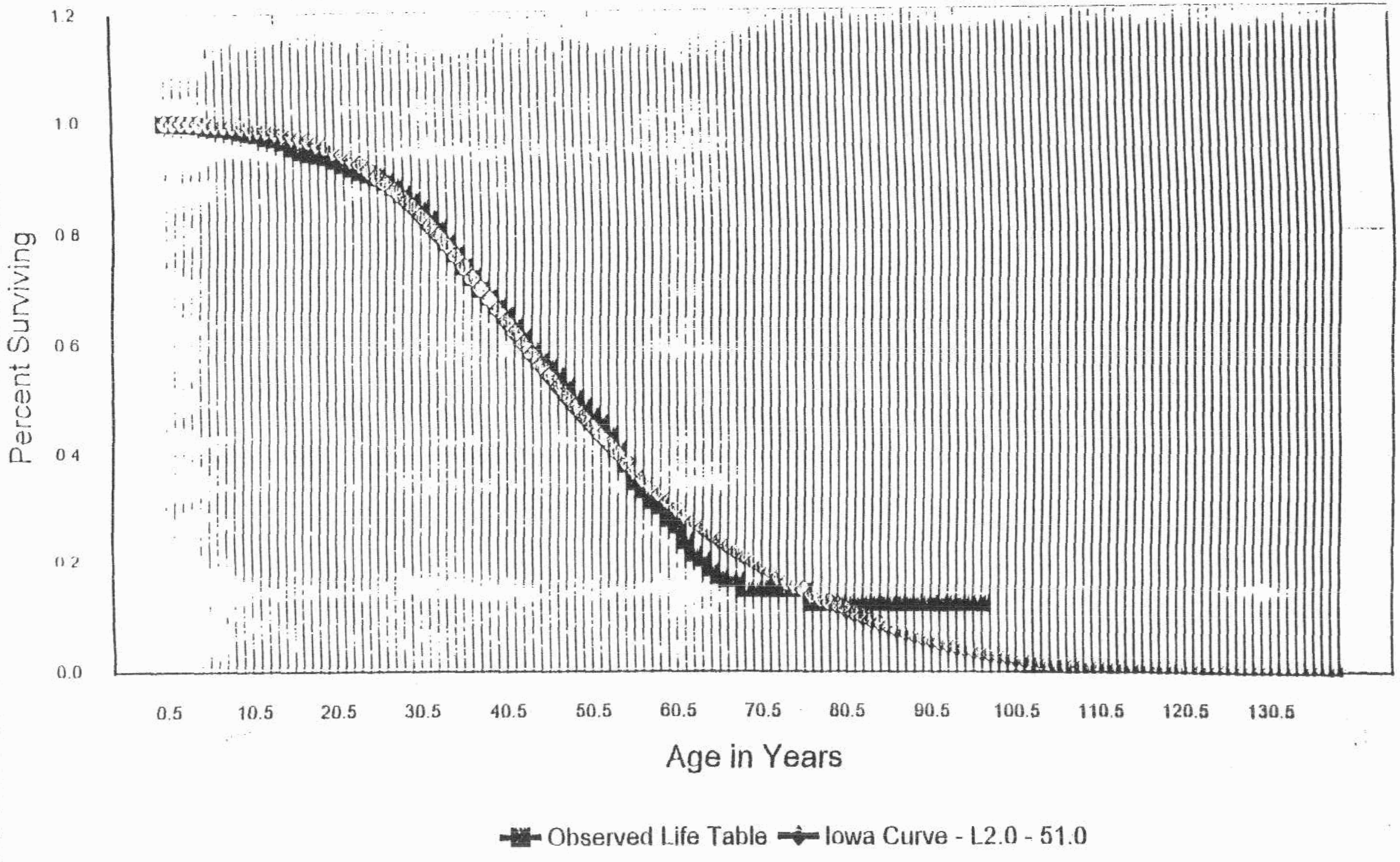
Snavely King performed an analysis of the full band (1899-1996) and a "shrinking band" analysis, in which the final year (1996) was held constant and the bands were continually shrunk. The results are discussed and set forth in tabular form below.

Band	Width	Life	Curve Type
1899-96	Full	51.0	L2.0
1977-96	20 years	45.5	L1.5
1982-96	15 years	46.5	L1.5
1987-96	10 years	51.5	L1.5
1992-96	5 years	55.0	L1.5

As the analysis indicates, the average life span for Other Production Units has lengthened in recent years.

OBSERVED LIFE TABLE AND THE BEST FIT IOWA CURVE

All US Other Production Units: Band 1899-1996



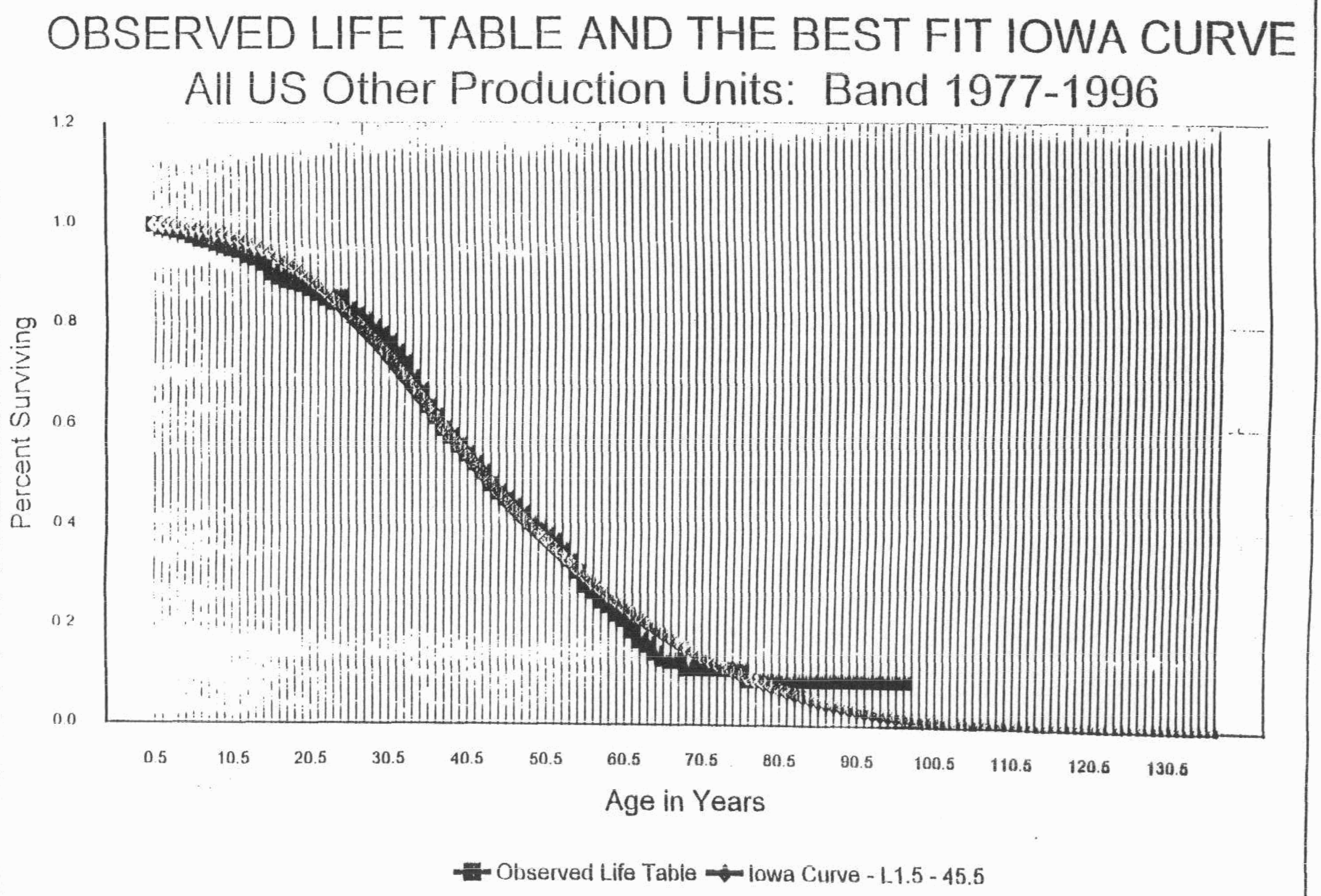
[illegible] ACTUARIAL ANALYSIS

CURVE FITTING RESULTS

ACCOUNT: 340000

BAND: 1899-1996

RANK	IOWA CURVE	AVERAGE SERVICE LIFE	SUM OF SQUARED DEVIATIONS
1	L2	51.20	1121.49
2	L1.5	51.30	1501.[illegible]
3	S1	49.50	2464.35
4	S0.5	49.30	2597.38
5	S1.5	49.50	2844.13
6	L3	51.00	3002.02
7	L1	50.50	3063.37
8	R1.5	48.50	3161.55
9	R2	46.50	3396.06
10	S0	49.00	3662.55
11	R1	46.00	4002.59
12	S2	49.50	4034.31
13	R2.5	49.20	4593.23
14	L0.5	50.50	4670.29
15	R0.5	48.[illegible]	[illegible]
16	S-0.5	46.50	5207.52
17	R3	49.20	6714.34
18	L0	50.50	7402.91
19	S3	49.50	7730.25
20	L4	50.00	9248.98
21	O1	46.00	9442.50
22	O2	51.50	9563.52
23	R4	49.50	11975.75
24	S4	49.50	14513.79
25	L5	50.00	15751.01
26	O3	60.00	18840.94
27	R5	49.50	[illegible]
28	S5	49.[illegible]	[illegible]
29	O4	52.50	[illegible]
30	S6	49.50	30679.79
31	S[illegible]	48.50	49139.21



Exhibit___(MJM-5)
Schedule 8
Page 4 of 11

ACTUARIAL ANALYSIS

CURVE FITTING RESULTS

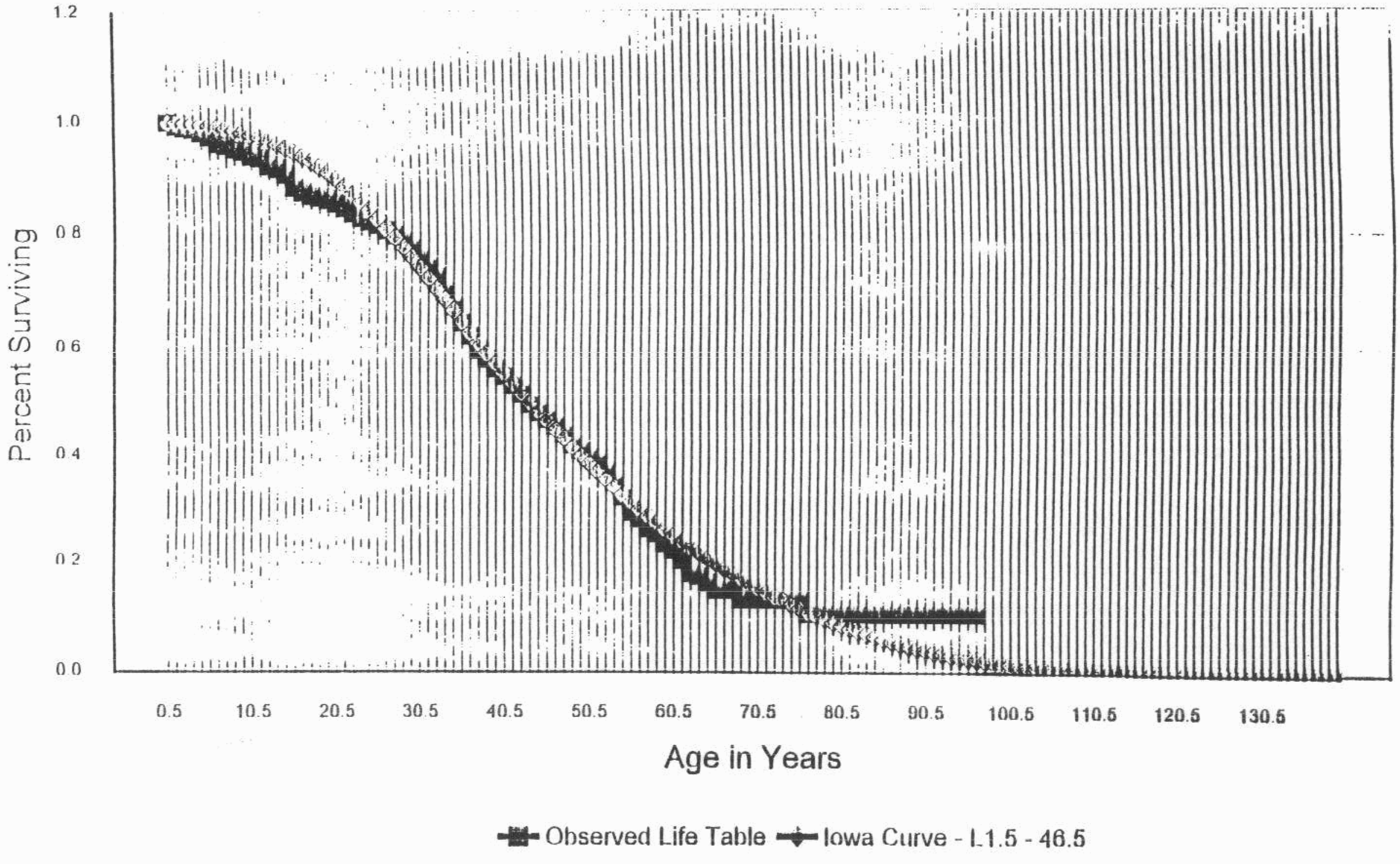
ACCOUNT: 340000

BAND: 1977-1996

RANK	IOWA CURVE	AVERAGE SERVICE LIFE	SUM OF SQUARED DEVIATIONS
1	L1.5	45.50	900.58
2	L1	45.50	1240.38
3	L2	46.00	1250.21
4	S0.5	44.50	1801.02
5	S0	44.00	1959.24
6	L0.5	45.50	[illegible].95
7	R1	43.50	2255.45
8	S1	44.50	2424.21
9	R1.5	44.00	2458.30
10	R0.5	43.00	2990.55
11	S-0.5	43.50	3082.96
12	S1.5	45.00	3323.54
13	R2	44.00	[illegible]
14	L0	45.50	3391.33
15	L3	45.50	4709.46
16	O2	46.00	[illegible].34
17	S2	45.00	5039.[illegible]
18	O1	42.50	5427.41
19	R2.5	44.50	5671.30
20	R3	44.50	8599.[illegible]
21	SC	45.00	10146.67
22	L4	45.00	12007.12
23	O3	54.00	14120.29
24	R4	45.00	15092.27
25	S4	45.00	17394.70
26	O4	69.00	19880.31
27	L5	45.00	20210.98
28	R5	45.00	24158.29
29	S5	44.50	25405.04
30	S6	44.00	[illegible]
31	SQ	42.50	[illegible]

OBSERVED LIFE TABLE AND THE BEST FIT IOWA CURVE

All US Other Production Units: Band 1982-1996



ACTUARIAL ANALYSIS
CURVE FITTING RESULTS
ACCOUNT: 340000
BAND: 1982.1996

RANK	IOWA CURVE	AVERAGE SERVICE LIFE	SUM OF SQUARED DEVIATIONS
1	L1.5	46.50	1204.36
2	L1	46.00	1252.33
3	L0.5	46.00	1755.[illegible]
4	L2	46.50	2068.38
5	S0	45.00	[illegible].27
6	S0.5	45.00	2255.34
7	R1	44.00	2581.92
8	R0.5	44.00	[illegible]
9	S-0.5	44.50	2845.51
10	L0	46.00	[illegible]
11	R1.5	44.50	[illegible]
12	S1	45.50	[illegible].18
13	O2	47.00	4164.19
14	S1.5	45.50	4758.33
15	O1	43.50	4784.24
16	R2	45.00	4858.47
17	L3	46.50	61[illegible].38
18	S2	45.50	6923.70
19	R2.5	45.00	7057.54
20	R3	45.50	10311.17
21	O3	55.00	11949.54
22	S3	45.50	12123.34
23	L4	46.00	14109.15
24	O4	70.50	16995.56
25	R4	45.50	17[illegible]
26	S4	45.50	20252.31
27	L5	45.50	22584.70
28	R5	45.50	25713.30
29	S5	45.50	29071.12
30	S6	45.00	[illegible]45.22
31	SQ	42.50	54451.44

OBSERVED LIFE TABLE AND THE BEST FIT IOWA CURVE

All US Other Production Units: Band 1987-1996

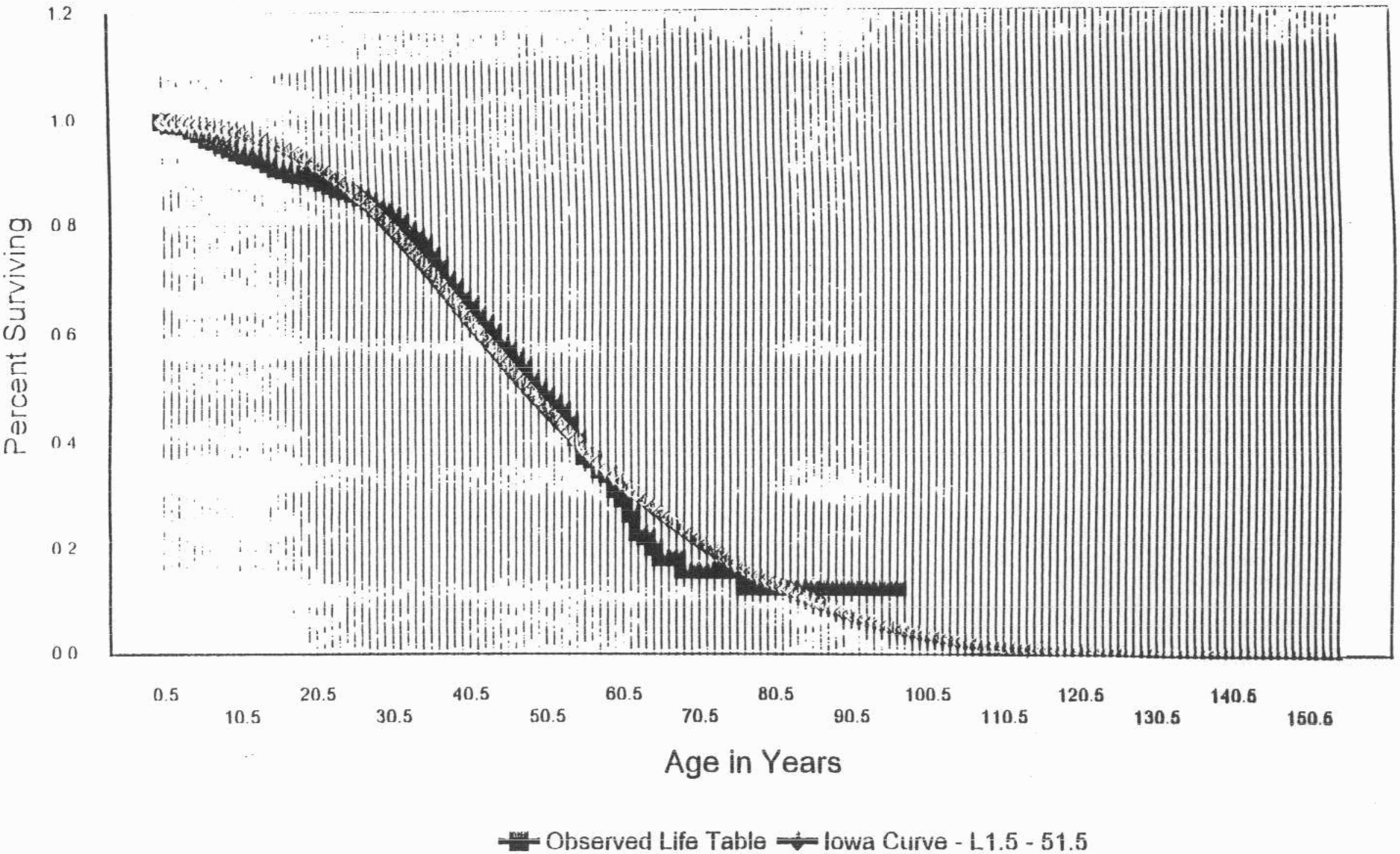
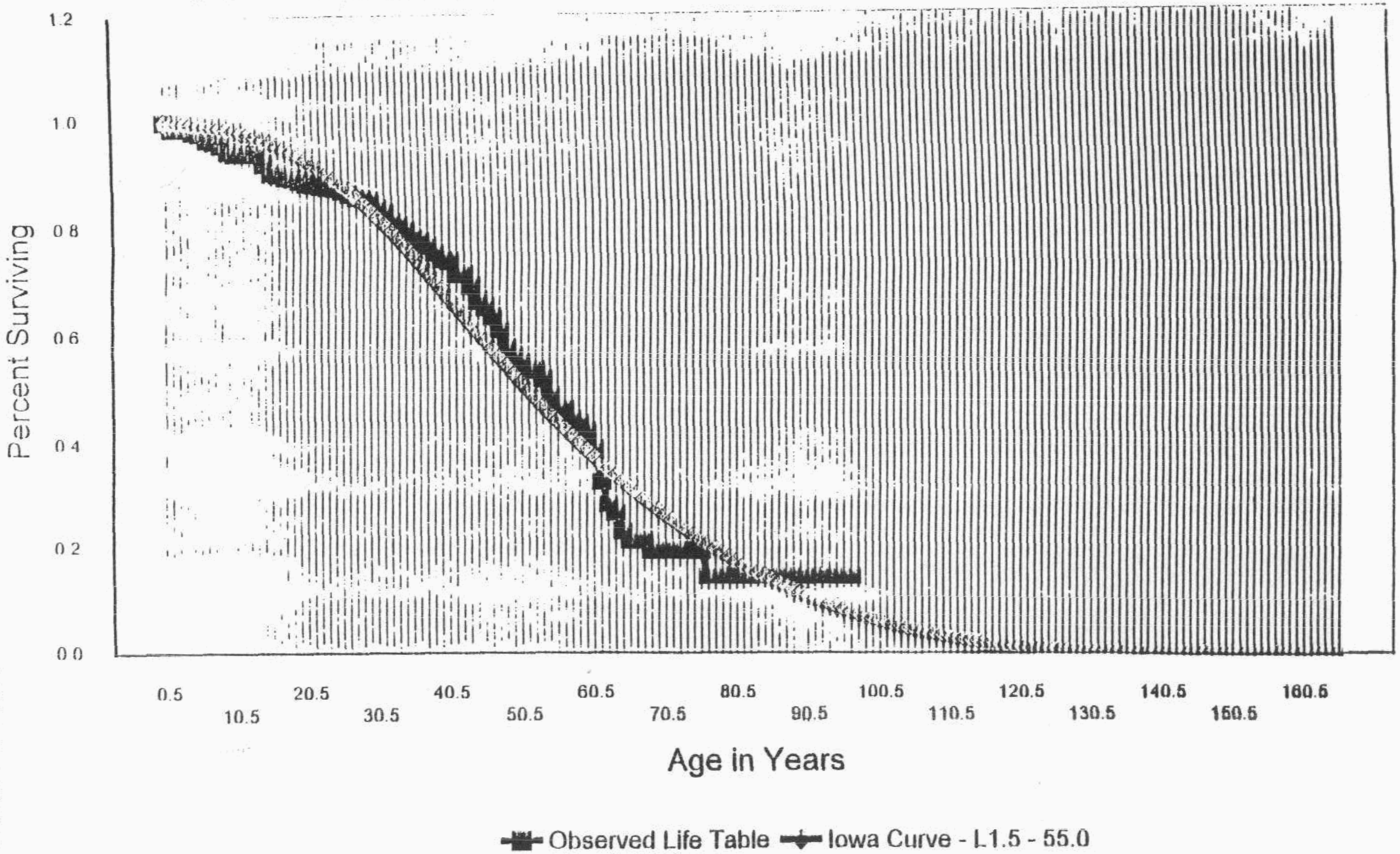


Exhibit ___ (MJM-5)
Schedule 8
Page 8 of 11

ACTUARIAL ANALYSIS
CURVE FITTING RESULTS
ACCOUNT: 340000
BAND: 1987.1996

RANK	IOWA CURVE	AVERAGE SERVICE LIFE	SUM OF SQUARED DEVIATIONS
1	L1.5	51.50	1405.50
2	L2	52.00	1692.33
3	L1	51.00	2217.38
4	S0.5	50.00	[illegible]
5	S0	50.00	256[illegible].92
6	R1.5	49.50	[illegible].35
7	R1	49.00	2735.5[illegible]
8	S1	50.50	2800.7[illegible]
9	L0.5	51.00	3192.56
10	R0.5	49.00	3602.23
11	S-0.5	49.50	3746.13
12	S1.5	50.50	37[illegible]
13	R2	49.50	3961.7[illegible]
14	L3	51.50	4709.31
15	L0	51.50	5077.34
16	S2	50.50	5577.36
17	R2.5	50.00	56[illegible]
18	O1	49.00	6427.15
19	O2	52.50	6512.13
20	R3	50.00	8424.37
21	S3	50.50	101[illegible].36
22	L4	51.00	11895.74
23	R4	50.50	14644.13
24	O3	52.50	14675.23
25	S4	50.50	17659.33
26	O4	52.50	19[illegible].04
27	L5	51.00	20050.39
28	R5	51.00	23709.71
29	S5	51.00	25191.98
30	S6	51.00	34629.12
31	SQ	49.50	52556.52

OBSERVED LIFE TABLE AND THE BEST FIT IOWA CURVE
All US Other Production Units: Band 1992-1996



ACTUARIAL ANALYSIS
CURVE FITTING RESULTS
ACCOUNT [illegible]
BAND [illegible]

RANK	IOWA CURVE	AVERAGE SERVICE LIFE	SUM OF SQUARED DEVIATIONS
1	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]
6	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]
9	[illegible]	[illegible]	[illegible]
10	[illegible]	[illegible]	[illegible]
11	[illegible]	[illegible]	[illegible]
12	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]
14	[illegible]	[illegible]	[illegible]
15	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]
17	[illegible]	[illegible]	[illegible]
18	[illegible]	[illegible]	[illegible]
19	[illegible]	[illegible]	[illegible]
20	[illegible]	[illegible]	[illegible]
21	[illegible]	[illegible]	[illegible]
22	[illegible]	[illegible]	[illegible]
23	[illegible]	[illegible]	[illegible]
24	[illegible]	[illegible]	[illegible]
25	[illegible]	[illegible]	[illegible]
26	[illegible]	[illegible]	[illegible]
27	[illegible]	[illegible]	[illegible]
28	[illegible]	[illegible]	[illegible]
29	[illegible]	[illegible]	[illegible]
30	[illegible]	[illegible]	[illegible]
31	[illegible]	[illegible]	[illegible]

CERTIFICATE OF SERVICE
DOCKET NO. 010949-EI

I HEREBY CERTIFY that a true and correct copy of the foregoing Direct Testimony of Michael J. Majoras has been furnished by hand-delivery (*) or U.S. Mail to the following parties on this 27th day of December, 2001.

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