

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

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 60 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 instance, some units listed as retired had no retirement dates indicated, etc.

Analysis

Snavely King initially conducted a full band (1918-1999) resulting in a 54 L4 life and Iowa curve indication. Snavely King's initial ten-year band resulted in a 59 L4 indication and its initial rolling and shrinking band analysis showed trends toward longer lives – as long as 70 years.

Snavely King's update consisted of an analysis of the full band (1900-2000) and the most recent ten-year band (1991-2000) of data. The full band analysis had a best fit result of 60.5 L3, which indicates a 60 year life. The ten-year band best fit was a 59.5 R4, which indicates a 59 year life. 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.

Expanded Full Band Analysis

The expanded full band analysis held the initial year constant but used cut-off dates of 1999, 1998, 1997 and 1996. The actuarial analyses yielded the following results.

Expanded Full Band Analysis		
Band	Life	Curve Type
1900-00	60.5	L3
1900-99	58.5	L3
1900-98	58	L3
1900-97	57	L3
1900-96	56	L3

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
1991-2000	59.5	R4
1990-1999	56	R4
1989-1998	57.5	L4
1988-1997	54	S4
1987-1996	54.5	L4

This indicates an 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.

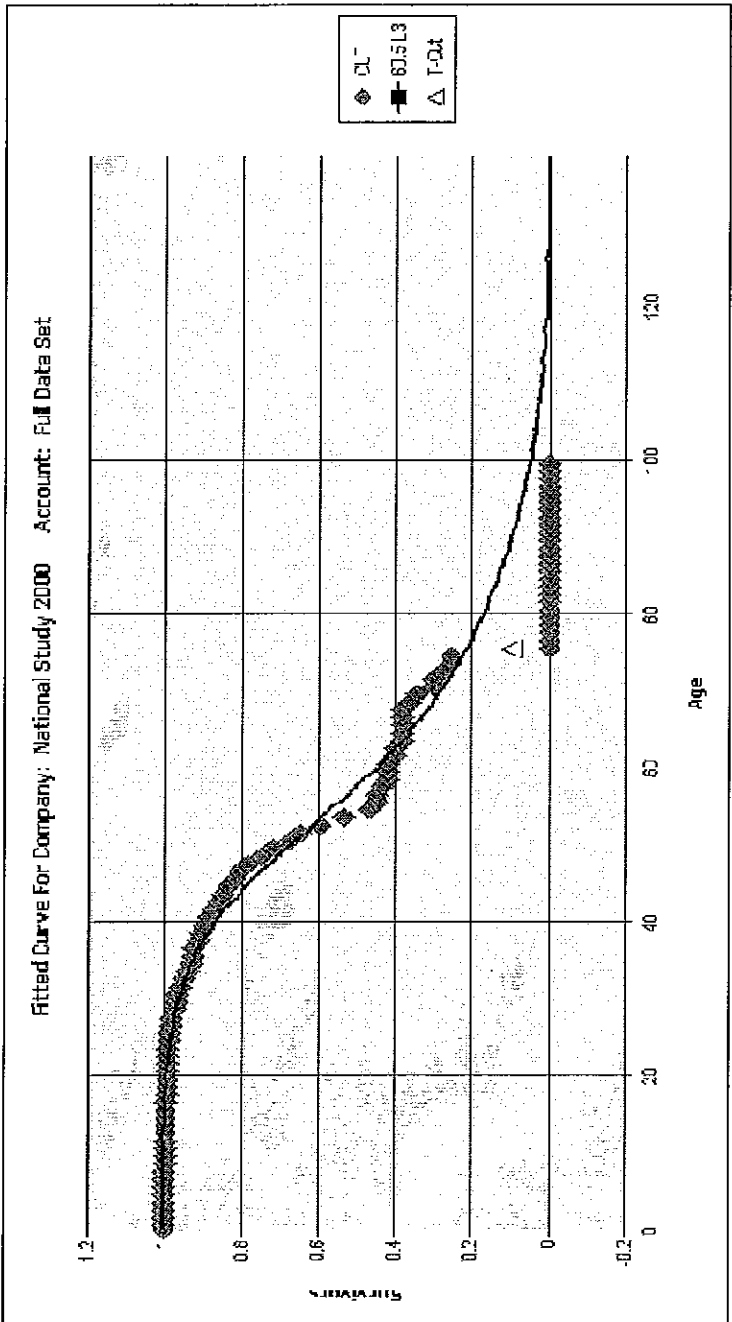
Shrinking Band Analysis

Finally, Snavely King did a “shrinking band” analysis, in which the final 2000 year was held constant and the bands were continually shrunk.

Band	Width	Life	Curve Type
1996-99	5 years	77.5	R2
1995-00	6 years	74.5	R2.5
1994-00	7 years	66.5	R3
1993-00	8 years	69.5	L3
1992-00	9 years	67.5	L3
1991-00	10 years	59.5	R4
1986-00	15 years	58	R4
1981-00	20 years	56	L4
1976-00	25 years	55	L4

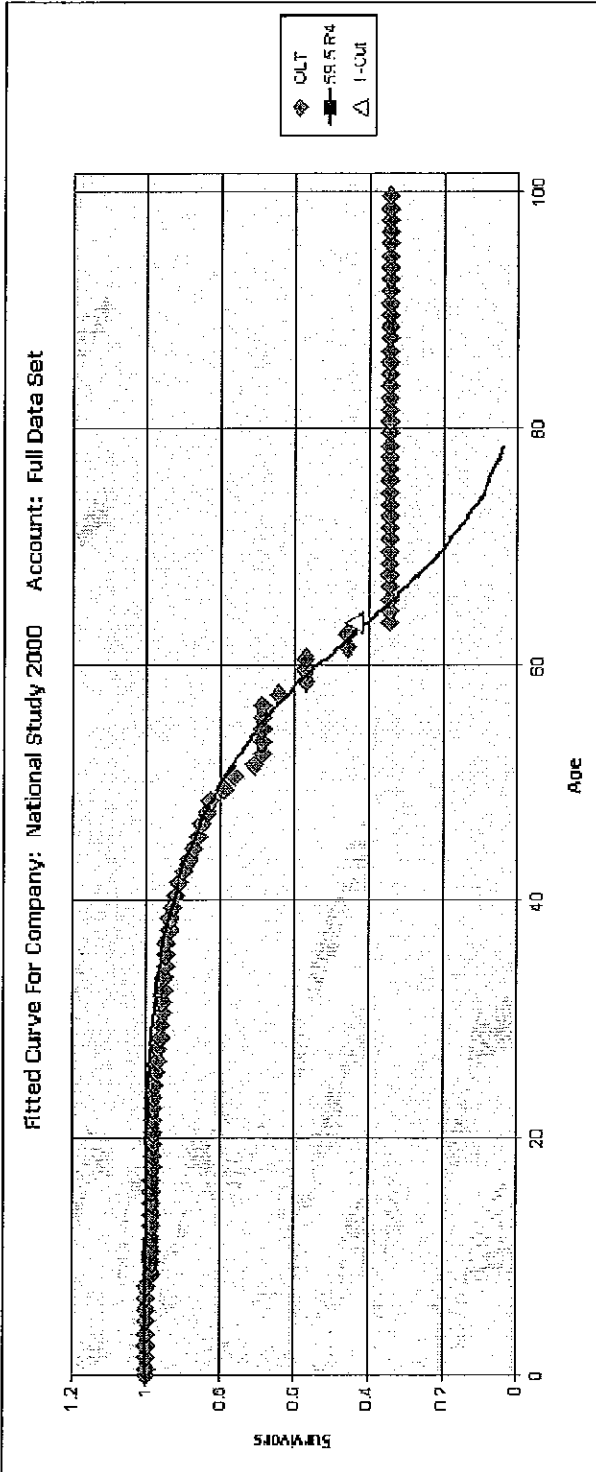
The shrinking band analysis corroborated earlier results and conclusions. The average life span of steam units 50 MW and Greater is currently in the 60-year range and is getting longer.

Best Fit Curve for 1900-2000



Analytical Parameters
 OLT Placement Band: 1900 - 2000
 OLT Experience Band: 1900 - 2000
 Minimum Life Parameter: 10
 Maximum Life Parameter: 150
 Life Increment Parameter: 0.5
 Maximum Observations (T-Cut): 77 (75.5)

Best Fit Curve Results for 1991-2000



Analytical Parameters

OLT Placement Band: 1900 -2000
 OLT Experience Band: 1991 - 2000
 Minimum Life Parameter: 10
 Maximum Life Parameter: 150
 Life Increment Parameter: 0.5
 Maximum Observations (T-Cut): 65 (63.5)