

**MICHAEL A. CARNALL**

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**EDUCATION**

- Ph.D., Economics, University of Illinois, Urbana-Champaign, 1996.
- M.S., Economics, University of Illinois, Urbana-Champaign, 1995.
- M.S., Civil Engineering, Bradley University, Peoria, IL, 1986.
- B.S. (Magna Cum Laude), Civil Engineering, Bradley University, Peoria, IL, 1977.

**PRESENT EMPLOYMENT**

LECG/Navigant Consulting Inc., July 1996 - present.

Managing Economist, January 1999 – present  
Senior Economist, July 1996 – December 1998

Research and analyze of issues surrounding the deregulation of telecommunications, providing expert testimony in regulatory proceedings.

- Advise clients in the electric power industry on transmission pricing, economic aspects of reliability and competitive distribution access issues.

- Design, analyze and critique telecommunications cost models.

- Model and analyze domestic and international airline markets in support of expert testimony in litigation and regulatory proceedings.

- Advise and provide expert testimony to clients regarding statistical and economic issues in service quality measurement.

**RESEARCH INTERESTS**

Industrial Organization, business reactions to deregulation, regulation and the relationship between business and government.

**TEACHING EXPERIENCE**

1995-1996: Teaching Assistant, Economic Statistics, University of Illinois.

- Course in statistics for Economics and other Commerce majors. Included use of all common

distributions in hypothesis testing.

1991-1992: Teaching Assistant, Introductory Economics, University of Illinois.

1986-1987: Instructor, Illinois Central College, Peoria, IL (part-time). BASIC and dBASE language programming for personal computers.

1986: Instructor, Fluid Mechanics, Bradley University, Department of Civil Engineering, Peoria, IL.

## **PROFESSIONAL EXPERIENCE**

HAAS SCHOOL OF BUSINESS, University of California, Berkeley, 1993 - 1995.

Visiting Researcher

INSTITUTE OF GOVERNMENT AND PUBLIC AFFAIRS, University of Illinois at Urbana-Champaign, 1991 - 1993.

Research Assistant

CATERPILLAR INC., 1978 - 1992.

Consultant, 1991 - 1992.

Develop a system to integrate collection and analysis of internal and external defect records at Leicester, England manufacturing facility.

Senior Reliability Analyst, Service Engineering, Peoria, IL, 1982 - 1991.

Responsible for providing analytical support to Service Engineering, the corporate division responsible for liaison between customers, design and manufacturing.

As the Corporation was restructured from a functional form into a loose organization of product based divisions, maintenance of quality and reliability standards became a paramount issue. The following projects were undertaken in support of the restructuring:

Develop the quality and reliability measures used as part of the performance standards used to determine each product division's profit sharing potential. Present quarterly reports of these measures to all divisions.

Host the annual corporate conference presenting new developments in product reliability and quality measurements. The conference was attended by representatives from all subsidiaries.

Develop systems and procedures to allocate warranty expenses among the product divisions.

General support provided to the design and service engineering organizations included the following:

Develop and present seminars on the statistical methods of reliability analysis to design and service engineers at subsidiary facilities in Europe, Brazil, Australia and Japan.

Develop and present a course in the theory and practice of statistical reliability and quality analysis. The course was directed toward graduate engineers, active in either the design or service areas.

Develop a method of estimating the impact of proposed engineering changes on product reliability. Present the results of the analyses as part of product design reviews.

Develop a method for estimating the lifetime economic cost of reliability problems.

Develop a system centralizing all product problem information, providing a common database with input/output tailored to the needs of each subsidiary.

Develop a system to process warranty claims for special marketing programs.

Develop a system to receive, analyze and report data on equipment participating in "Field Follow"

programs.

Estimate corporate liability under extended warranty terms.

Facilities Planning Staff Engineer, Mapleton Foundry, 1980 - 1982

Planning, including assessment of need, design liaison, acquisition and installation of capital equipment.

Environmental Engineer, Mapleton Foundry, 1978 - 1980.

Technical assistance to utility operating personnel, acquisition and maintenance of all state and federal permits, review of proposed changes to plant equipment and operating procedures to assure compliance with all environmental regulations.

## **PRESENTATIONS AND REGULATORY PROCEEDINGS**

Written expert testimony and cross-examination on behalf of U S WEST for consolidated cost dockets in Washington (Dockets UT-9603769, UT-960370 and UT-960371, June 1997) and Utah (Docket No. 94-999-01, May 1997).

Participated in cost workshops on behalf of U S WEST with the Utah Division of Public Utilities (February 1997), Washington (March 1997), Minnesota (May 1997).

Oral testimony and cross-examination on behalf of U S WEST in Wyoming (Docket No. 70000-TR-96-323, June 1997).

Oral testimony and written comments on behalf of U S WEST in Colorado (Docket No. Docket No. 97R-153T, February 19, 1998).

Written expert testimony and cross-examination on behalf of U S WEST regarding statistical measurements of service quality, Arizona (Docket No. U-3021-96-448, June 1998), Utah (Docket on Rules R746-365, June 1998), Iowa (Docket Nos. AIA-96-1 (ARB-96-1), AIA-96-2 (ARB-96-2), March 1998), Minnesota (Docket No. P-442,5321,421/CI-97-381, June 1998)

Written comments regarding statistical methods on behalf of U S WEST to the FCC in regard to the FCC NPRM "Performance Measurements and Reporting Requirements for Operations Support Systems, Interconnection, and Operator Services and Directory Assistance" (Docket No. 98-56, RM-9101, June 1998)

Declaration regarding statistical measurement on behalf of Pacific Bell in "Investigation on the Commission's Own Motion into the Establishment of a Forum to Consider Rates, Rules, Practices and Policies of Pacific Bell and GTE California Incorporated" (Docket No. 90-02-047, August 1998).

Ex Parte presentation to FCC on behalf of U S WEST, regarding statistical issues of service quality measurement, June 1999.

Written expert testimony and cross-examination on behalf of El Paso County Telephone Company in "The Matter of ICG's Application for Operating Authority in Portions of El Paso County" (Colorado Docket No. 99A-342T).

Affidavit on behalf of Ameritech Michigan regarding the statistical validity of the sampling procedure used in Ameritech's current AFAM cost model. (MPSC Case No. U-11831, June 1999).

Statement in reply to the U.S. Department of Transportation's "Enforcement Policy Regarding Unfair Exclusionary Conduct in the Air Transportation Industry" (Docket OST-98-3713, September 1998)

Participate in a panel discussion on airline competition at the annual meeting of the National Association of State Aeronautics Officials.

## GRANTS AND CONTRACTS

National Center for Supercomputing Applications, NSF grants for supercomputing resources in support of dissertation work. (with P.T. Spiller)

Pittsburgh Supercomputing Center. NSF grant for supercomputing resources in support of dissertation work (with P.T. Spiller)

## DISSERTATION TOPIC

*"Three Essays on Demand and Cost in the Deregulated Domestic Airline Industry"*

Topics include:

"Airline Hubs: Costs, Markups and the Implications of Customer Heterogeneity"

"Evolution of Demand and Marginal Cost in the U.S. Airline Industry from 1985 to 1993"

"The Effects of Bankruptcy on the Demand and Marginal Cost of Passenger Airlines"

## PUBLICATIONS

"Airline Hubs: Costs, Markups and the Implications of Customer Heterogeneity", with Steven Berry and Pablo T. Spiller, NBER Working Paper 5561, May 1996.

## HONORS AND PROFESSIONAL ACTIVITIES

Licensed Professional Engineer, State of Illinois.

Member National Society of Professional Engineers.

Member American Society of Civil Engineers.

Member of Tau Beta Pi, engineering honorary.

October 1999