

PROFESSIONAL RESUME

CHARLES DAVID COOPER, PhD, PE, QEP

Professor of Engineering, Civil & Environmental Engineering
University of Central Florida
Orlando, Florida 32816-2450

DISCIPLINES: Environmental Engineering; Chemical Engineering

PERSONAL DATA: Born: October 21, 1947; Atlanta, Georgia
Marital Status: Married, 3 children

EDUCATION: B.S. Chemical Engineering, Clemson University, 1969
M.S. Chemical Engineering, Rice University, 1971
Ph.D. Chemical Engineering, Clemson University, 1980

UNIVERSITY EXPERIENCE:

TEACHING:

Dr. Cooper is presently a Professor of Engineering in the Civil and Environmental Engineering Department at UCF. Dr. Cooper's teaching interests are in the areas of Hazardous Wastes Incineration, Atmospheric Dispersion Modeling, and Air Pollution Control, on which topic he has written a widely-used textbook, [Air Pollution Control - A Design Approach](#).

Dr. Cooper has taught a variety of courses, spanning a wide range of levels and disciplines, from freshman Chemistry to graduate level Engineering. While at UCF he has taught 17 different courses, six of them graduate courses. He has supervised 4 PhD students (3 to completion), and 27 master's students (22 to completion). In 1982, 1990, and again in 2003, Dr. Cooper was selected as Outstanding Teacher of the Year in the College of Engineering.

Dr. Cooper has coordinated and co-taught a detailed, 4-day Short Course on Mobile Source Air Quality Modeling, both to consultants and to regulators from all over the country in each of the past fifteen years. In July 1998, at the special request of Illinois DOT, he took the course to Chicago, IL, and in May, 2001, he taught the course to the Alabama DOT in Montgomery AL. From December, 1991, through May, 1996, he was a principal instructor in an annual five-day short course on Environmental Impacts from Transportation sources for both the World Bank and for the International Road Federation.

Resume – C.D. Cooper (cont.)

UNIVERSITY EXPERIENCE:

RESEARCH:

Despite his significant teaching load, Dr. Cooper has always been active and productive in research. He has conducted a variety of research projects, with his main interests being in air pollution control and modeling, and combustion/incineration. As a product of his research activity, Dr. Cooper has obtained significant funding for UCF students and faculty, and has published numerous peer-reviewed journal articles. Sponsors of his research over the years include the U.S.EPA, NASA, the Gulf Coast Hazardous Substance Research Center, Florida DOT, Florida DEP, and others. Throughout his career, Dr. Cooper has been the Principal Investigator or co-PI on more than 31 research contracts worth more than \$3.2 million in funding for UCF. A chronological listing of significant research projects since 1990, their sponsors, their dollar value to UCF, and his role in them follows:

<u>Year</u>	<u>Short Title</u>	<u>Sponsor</u>	<u>Dollar Value</u>	<u>Role</u>
90-94	Hazardous vapor incineration	GCHSRC	\$264,000	co-PI*
90-91	Enhanced CO Screen Test	Fla DOT	\$ 11,000	PI
91-93	Poll. releases from surface finishing	US EPA	\$197,000	co-PI
91-94	Ozone Evaluation of Central Fla	Fla DEP	\$192,000	co-PI*
92-93	Update of FDOT CO Screen Test	Fla DOT	\$ 15,000	PI
92-94	Landfill Gas Emissions	Orange Cnty	\$111,000	co-PI
93-94	Determining Correct RVP values	Fla DOT	\$ 17,000	PI
93-96	Removal of NOx from HWIs	GCHSRC	\$162,000	co-PI*
93-97	FLINT – Fla Intersection Model	Fla DOT	\$300,000	co-PI*
93-95	Hot-Cold Start Proportions	Fla DOT	\$200,000	co-PI
94-95	Tech Supt-Health/Env Impacts	FCSHWM	\$ 15,000	PI
96-97	COSCREEN update to Windows	Fla DOT	\$ 56,000	PI
96-98	NOx Control at KSC Boilers-I	NASA	\$298,000	co-PI*
97-99	NASA Particulate Matter Study	NASA	\$173,000	PI
98-99	NOx Control at KSC Boilers-II	NASA	\$140,000	co-PI*
99-00	Empirical Ozone Modeling	FDEP	\$ 75,000	PI
00-01	NOx Control at KSC Boilers-III	NASA	\$100,000	co-PI*
01-02	GA DOT Air Quality Model	Ga DOT	\$ 33,000	PI
01-02	Tech Transfer – H ₂ O ₂ to Control NO _x	GCHSRC	\$ 33,000	PI
02-04	Ala. MOBILE6 Air Quality Model	AL DOT	\$123,000	PI
02-03	Emission Inventory of Central Fla	Metroplan	\$ 20,000	PI
04	Update of COSCREEN to MOBILE6	FDOT	\$ 46,000	PI
06-07	Air Quality Services to Metroplan	Metroplan	\$ 32,000	PI
07	Odor Modeling	FCSHWM	\$ 40,000	PI
07-09	APC Engineering Experience for UG	Siemens	\$270,000	PI

*For these co-PI research projects, Dr. Cooper was the main proposal writer and the research project manager

Resume – C.D. Cooper (cont.)

SERVICE:

Dr. Cooper has actively served the Department, the College, and the University in a variety of ways. Since 1991, he has served as the Environmental Group Coordinator in the CEE Department. He has served on many committees, some of which are listed below:

COE Academic Standards Comm (1980-81)	CEE Strategic Planning Comm (1997-98)
UCF Admissions & Stds Comm (1981-84)	Industrial Combustion Coordinating Rule-making (ICCR) Committee [a Federal Advisory Committee for helping the U.S. EPA set national emission standards for hazardous air pollutants] (1997-2000)
COE Personnel Committee (1981-83)	University Athletic Committee (1997-2002)
COE Library Committee (1982-84)	COE Tenure and Promotion Committee (1998-1999)
UCF Graduate Council (1983-86)	CEE Faculty Eval. Criteria Comm (1998)
Safety Committee (College, 1983-84)	UCF 5-year Review (of Dr. David Block) Committee (1999)
Ad Hoc Chem. Engr. Comm. (1983-86)	COE Promotion & Tenure Comm. (2000)
Merit Pay Committee (College, 1984-85)	COE Salary Equity Comm. (Chair) (2000)
Research Council (University, 1985-87)	COE Research Incentive Awards Committee (Chair) (2001)
UCF Sabbatical Leave Committee (1986-88)	CEE Personnel Comm. (Chair) (2001-2002)
Search Comm. - V.P. for Research (UCF, 1986-87)	CEE Faculty Search Committee (Chair) (2001-2002 & 2002-2003)
Search Committee - Dean of Engineering (University, 1987-88)	CECS TIP Selection committee (2002)
Academic Planning Committee (University, 1988-1991)	CEE Dept Grad. Coord. (2002 - current)
CEBA IIIb Planning Committee (1989-91)	CEE Personnel Comm. (Chair) (2003-2004)
CEE Dept. Chair Search Comm (1989-90)	CEE Dept Chair Search Comm (2004-05)
General Education Program Committee (University, 1992-94)	CEE Faculty Evaluation Committee (2005)
Tenure & Promotion Committee (University, 1993-1995)	CECS Sabbatical Leave Comm. (2005-06)
CEE Dept. Chair 5-year Review Comm (1995)	UCF Graduate Council (2005-2007)
CEE Dept. Faculty Search (1995-96)	CEE Faculty Search committees (2005-2007)
COE Professional Excellence Program (PEP) Committee (1996)	

Resume – C.D. Cooper (cont.)

In addition to his University service, Dr. Cooper has actively served the local community and professional organizations. He has been particularly active in the Florida Section - Air and Waste Management Association (FAWMA), having been technical co-chair for the 1986 Annual Meeting, Secretary-Treasurer elect (1986-87), Secretary-Treasurer (1987-88), Vice Chairperson (1988-89), and Chairperson of the Florida Section (1989-90). He was Technical Chair of 1999 Annual meeting of FAWMA, and Technical Co-Chair of the 2001 International AWMA meeting (≈4000 attendees). He continues to chair the FAWMA Scholarship Awards Committee (since 1989). He was elected to Fellow membership in AWMA in 2001. He is currently on the Board of Directors of the International AWMA.

INDUSTRIAL EXPERIENCE: From 1971 through May 1976, Dr. Cooper worked at the Exxon Refinery in Baytown, Texas. During this time, he was assigned to various different positions of increasing responsibility:

1. Process Computer Control Engineer - developed realtime computer control programs for hydrodesulfurization and platinum reforming processes. Generated credits for the refinery on the order of \$300,000 annually attributed to better control of refining processes, maximization of octane improvement, and reduction in operating costs.
2. Refinery Short Range Economics Section - Dr. Cooper analyzed various refining operations for economic profitability and recommended changes in processing strategy as necessary. Dr. Cooper spear-headed a refinery wide program for maximizing gasoline production in the summer of 1973, and heating oil production in the winter of 1974 during the Arab oil embargo.
3. Product Coordination Section - Dr. Cooper coordinated overall refinery fuel products processing and issued operating guidelines to allow smooth transitions within the refinery from one operating mode to the next. Dr. Cooper was intimately involved in coordinating the start-up of the entire refinery after an emergency shut-down.
4. Process Engineering Design Section - Dr. Cooper designed the modifications required to convert four 15 MW steam-electric power boilers from gaseous to liquid fuel firing.
5. Operations Section Head - Dr. Cooper was the operating supervisor for the light ends fractionation section of the refinery. He had prime responsibility for three major refinery process units and supervision of forty-one (41) operations personnel plus 8-10 technical personnel. His operating budget was in the range of \$10,000,000 per year.

Resume – C.D. Cooper (cont.)

CONSULTING EXPERIENCE: Dr. Cooper has conducted a number of air quality studies for the private sector, with emphasis being on the modeling carbon monoxide concentrations due to large indirect sources. Studies have been completed for the following projects:

- Central Florida Research Park (Orange County, 1984)
- Dupont Centre (Downtown Orlando, 1985)
- CC&F Office Park-Airport (Orlando, 1985)
- Trinity Communities (Pasco County, 1986)
- Apollo-Hickory Road Alignment Study (Melbourne, 1986)
- Huckleberry (Orange County, 1987)
- Orlando International Center (Orlando, 1987)
- Seminole County Expressway (Seminole County, 1987)
- Lakeview (Polk County, 1987)
- Quadrangle-Sub. Dev. (Orange County, 1987)
- Osceola Trace (Osceola County, 1988)
- Spring Rise (Orange County, 1988)
- Duda Lands Inc. (Seminole County, 1988)
- Osceola Corporate Center (Osceola County, 1989)
- HBJ Interchange Center (Orlando, 1989)
- Seminole Properties (Seminole County, 1989)
- Celebration (1991)
- Lake Bryan (1992)
- MAGLEV (Orlando, 1992)
- Sierra Land (1993)
- Raceplex (Lake County, 1993)
- City of Orlando downtown CO study (1995-96)
- Sand Lake Road Waste Water Treatment Plant Odor (H₂S) Study (Orange County, 1997)
- World Expo Center DRI (Osceola County, 1998)
- ORHS Expansion DRI (Orlando, 1999)
- Saddle Creek DRI (Polk County, 1999)
- Flora Ridge DRI (Osceola County, 2000)
- Wesley Chapel Lakes DRI (Pasco County, 2000)
- Cape Coral Drinking Water Odor (H₂S) Study (Cape Coral, FL, 2001)
- South Shore Corporate Park DRI (Hillsborough County, 2001)
- Boggy Creek DRI (Central Florida, 2001)
- Triangle Town Commons (Raleigh, NC, 2002)
- Meadow Woods DRI (Central Florida, 2002)
- Spring Hills DRI (Ocala, 2003)
- ICP Binding Letter (Orange County, 2003)
- Celebration M&M Study (Osceola County, 2003)
- Cagan Crossings DRI (Lake County, 2003)
- Stoneybrook South DRI (Polk County, 2004)
- Osceola Corporate Center (Osceola County, 2004)
- Plaza Collina (Lake County, 2004)
- City of Orlando downtown CO study (2004-05)
- Lake Hutto DRI (Hillsborough County, 2005)
- Bronson Property (Osceola County, 2005)
- Epperson Ranch DRI (Pasco County, 2005)
- Karlton DRI (Lake County, 2005)
- Innovation Place DRI (Orange County, 2006)
- Riverland/Kennedy DRI (St. Lucie County, 2006)
- Ashley Glenn DRI (Pasco County, 2006)
- Moss Park DRI (Orange County, 2006)
- Rolling Oaks DRI (Osceola County, 2006)
- Wal-Mart Distribution Center (Putnam County, 2006)

In addition to the above air quality modeling studies, Dr. Cooper has consulted on the regulatory review of the process design of a major hazardous waste incinerator, and has been an expert witness in several legal actions involving air pollution.

Resume – C.D. Cooper (cont.)

**PROFESSIONAL
ACTIVITIES:**

Registered Professional Engineer:

1. Texas: #37700, 1975 - 1991
2. Florida: #23850, 1976 - present

Qualified Environmental Professional, 1995 - present

Member, Tau Beta Pi and Phi Kappa Phi

Fellow Member, International Air & Waste Management Association, 1980

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present (member of the Board of Directors, 2005-2007)

Member, Florida Air & Waste Management Association

Member, Institute for Professional Environmental Practice. 1995-present
(member of the Board of Trustees, 2005-2007)

**HONORS AND
AWARDS:**

Graduated with highest honors from Clemson Univ., 1969

Norris Medal (Clemson Univ. Outstanding Student), 1969

Who's Who in American Colleges and Universities, 1968

Society of American Military Engineers Award for Excellence, 1969

National Collegiate Athletic Association Graduate Studies Scholarship, 1970

NSF Fellowship, 1970 and 1971

UCF Foundation Award: Excellence in Teaching, Coll. of Engineering, 1982

Outstanding Young Men of America, 1983

Clemson University Athletic Hall of Fame, 1983

Selected to the UCF Quill, 1984

Distinguished Author, UCF Quill, 1987

Civil and Environ. Engr. Dept., Outstanding Teacher Award, 1989 & 1990

College of Engineering Excellence in Teaching Award, 1990

Teaching Incentive Program (TIP) Award, 1994

GCHSRC, UCF Coordinator Certificate of Appreciation, 1995

Professorial Excellence Program (PEP) Award, 1999

Teaching Incentive Program (TIP) Award, 2000

Fellow Member Air & Waste Management Association, 2001

Service Award from AWMA: Technical Vice-Chair of Annual Meeting, 2001

The 2002 Lyman A. Ripperton Award - bestowed by Air & Waste
Management Association to one outstanding educator in the air
pollution field in North America, 2002

Excellence in Undergraduate Teaching in CECS, 2003

The 2005 Clair Fancy Memorial Award – in recognition of outstanding
leadership and service to the Florida Section - AWMA

Resume – C.D. Cooper (cont.)

PUBLICATIONS:

BOOKS:

1. WANIELISTA, M.P., YOUSEF, Y.A., TAYLOR, J.S., and COOPER, C.D., Engineering and the Environment, Monterey, California, Brooks/Cole, 394 pages, 1984.
2. COOPER, C. DAVID and Alley, F.C. Air Pollution Control: A Design Approach, 2nd ed., Waveland Press, Prospect Heights, IL, 694 pages, 1994.
- 2a. COOPER, C. DAVID and Alley, F.C. Air Pollution Control: A Design Approach, 2nd ed. (in Korean language), 1996.
- 2b. COOPER, C. DAVID and Alley, F.C. Air Pollution Control: A Design Approach, 2nd ed. (in Chinese language), 1998.
3. COOPER, C. DAVID, DIETZ, JOHN D. and REINHART, DEBRA R., Foundations of Environmental Engineering, Waveland, Prospect Heights, IL, 365 pages, 1999.
4. COOPER, C. DAVID and Alley, F.C. Air Pollution Control: A Design Approach, 3rd ed., Waveland Press, Prospect Heights, IL, 735 pages, 2002.

U. S. PATENTS:

1. U. S. Patent 5,355,739: Apparatus for Measuring Gas Emission Rate from Soil. C. David Cooper, Debra R. Reinhart, and Debra Seligman. Oct. 18. 1994.
2. U. S. Patent 6,676,912: Air Pollution Method and Apparatus for Removal of Nitrogen Oxides from Stationary Combustion Sources. C. David Cooper, Christian A. Clausen, and Michelle M. Collins. Jan 13, 2004.

BOOK CHAPTERS:

1. Alley F. Chris and COOPER, C. DAVID, Chapter 86: “Air Pollution” in The Engineers Handbook, CRC Press, Boca Raton, FL (1995).
2. COOPER, C. DAVID, Chapter 1: “Fundamental of Hazardous Waste Incineration,” and Chapter 4: “Modeling the Atmospheric Dispersion of Hazardous Waste Incinerator Emissions,” in Hazardous Waste Incineration: Evaluating the Human Health and Environmental Risks, Lewis Publishers, Boca Raton, FL (1998).
3. COOPER, C. DAVID, “Vapor Incineration,” a chapter in *Air Pollution Engineering Manual*, 2nd Ed, John Wiley and Sons, New York (2000).
4. COOPER, C. DAVID. “Air Pollution Control Methods,” a Chapter in the Kirk-Othmer Encyclopedia of Chemical Technology, John Wiley & Sons, New York (2007).

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PEER REVIEWED JOURNAL ARTICLES:

1. COOPER, C.D., "Planning for the Management of Hazardous Wastes," Florida Scientist 44, 3 (1981): 129-136.
2. COOPER, C.D. and Alley, F.C., "Kinetic Analysis of a Non-Isothermal Reactor," AIChE Journal 27, 6 (November 1981): 1039-1041.
3. COOPER, C.D., Alley, F.C., and Overcamp, T.J., "Hydrocarbon Vapor Incineration Kinetics," Environmental Progress 1,2 (May 1982).
4. COOPER, C. DAVID, "Oxidation of Solvent Vapors by a Catalytic Paint-Drying Device," Plating and Surface Finishing, 73, 2 (February 1986).
5. COOPER, C. DAVID, "Indirect Source Impact Analysis - Carbon Monoxide Modeling," Journal of Air Pollution Control Association, Volume 37, No. 11 (November 1987).
6. COOPER, C. DAVID, "Persistence Factors for Mobile Source (Roadway) Carbon Monoxide Modeling," Journal of the Air Pollution Control Association, Vol. 39, No. 5 (May 1989).
7. COOPER, C. DAVID, CLAUSEN, CHRISTIAN A., Tomlin, Doug, Hewett, Mike, and Martinez, Al. "Enhancement of Organic Vapor Incineration Using Hydrogen Peroxide," J. Hazardous Materials, 27, pp. 273-285 (1991).
8. CLAUSEN, CHRISTIAN A., COOPER, C. DAVID, Hewett, Mike and Martinez, Al. "Enhancement of Organic Vapor Incineration Using Ozone," J. Hazardous Materials, 31, pp. 75-98 (1992).
9. Walker, Barry L. and COOPER, C. DAVID, "Air Pollution Emission Factors for Medical Waste Incinerators," J. Air & Waste Management Association, 42, 6 (1992)
10. REINHART, DEBRA R., COOPER, C. DAVID, and Walker, Barry L. "Flux Chamber Design and Operation for the Measurement of Municipal Solid Waste Landfill Gas Emission Rates," J. Air & Waste Management Association, 42, 8 (1992).
11. COOPER, C. DAVID, MALONE, LINDA C., and Liu, Pwu-Sheng. "Identifying *Worst-Case* Persistence Factors for Carbon Monoxide Modeling Near Intersections in Orlando, Florida." J. Air & Waste Management Association, 42, 11 (1992).
12. Hall, Mitchell S, DIETZ, JOHN D., COOPER, C. DAVID, WAYSON, ROGER L., and Bauman, Doug. "Atmospheric Releases of Hexavalent Chromium from Hard Chrome Plating Operations," Plating and Surface Finishing, 79,11 (Nov. 1992).

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PEER REVIEWED JOURNAL ARTICLES: (Cont.)

13. Martinez, Al, Geiger, Cherie, Hewett, Mike, CLAUSEN, CHRIS A., and COOPER, C. DAVID. "Using Hydrogen Peroxide or Ozone to Enhance The Incineration of Volatile Organic Vapors," Waste Management, **13**, pp. 261-270 (1993).
14. Martinez, Al, COOPER, C.DAVID, CLAUSEN, CHRIS A., and Geiger, Cherie. "Kinetic Modeling of The H₂O₂ Enhanced Incineration of Heptane and Chlorobenzene," Waste Management, **15**, pp. 43-53 (1995).
15. Kasper, John M., CLAUSEN, CHRISTIAN A. and COOPER, C. DAVID. "Control of Nitrogen Oxide Emissions by Hydrogen Peroxide - Enhanced Gas-Phase Oxidation of Nitric Oxide," J. Air & Waste Management Assoc., **46**, pp. 127-133 (1996).
16. AL-DEEK,HAITHAM M., ROGERL. WAYSON,C. DAVIDCOOPER, Debra Keely, Richard Traynelis, Pwu-Sheng Liu, LINDA C. MALONE, and Amy Datz, "Queueing Algorithm for Calculating Idling Emissions in FLINT – the Florida INTERsection Air Quality Model", in Transportation Research Record "Effects of Transportation on Energy and Air Quality, No. 1587, Transportation Research Board, National Academy Press, Washington, DC (1997).
17. Haywood, Jordan and C. DAVID COOPER, "The Economic Feasibility of Using Hydrogen Peroxide for the Enhanced Oxidation and Removal of Nitrogen Oxides from Coal-Fired Power Plants," Journal of Air & Waste Management Association, **48**, 3, 238-246 (1998).
18. Tazi, L.M., Collins, M., Nguyen, Q.D. Cooper, C. D, and Clausen, C.A. "Hydrogen Peroxide Enhanced Oxidation and Removal of Nitrogen Oxides from Flue Gases," Florida Scientist , v. 61 (1998).
19. COOPER, C. DAVID, Kim, Brian, and MacDonald, John. "Estimating the Lower Heating Values of Hazardous and Solid Waste," Journal of the Air & Waste Management Association, **49**, 4, 471-476 (1999).
20. Collins, Michelle M., COOPER, C. DAVID, Dietz, John D., Clausen, Christian A., and Tazi, Loubna. "A Pilot-Scale Evaluation of H₂O₂ Injection to Control NO_x Emissions," ASCE J. of Environmental Engineering, **127**, 4, 329-336 (2001).
21. COOPER, C. DAVID, Godlewski, Victor J., Hanson, Ray, Koletzke, Mark, and Webster, Neil. "Odor Investigation and Control at a WWTP in Orange County, Florida," Environmental Progress, vol 20, no. 3, pp. 133-143 (2001).
22. COOPER, C. DAVID, Clausen, Christian A., Pettey, Lucas, Collins, Michelle M., and Pozo de Fernandez, Maria. "Investigation of Ultraviolet Light-Enhanced H₂O₂ Oxidation of NO_x Emissions," ASCE J. of Environmental Engineering, **128**, 1, 68-72 (2002).

Resume – C.D. Cooper (cont.)

PEER REVIEWED JOURNAL ARTICLES: (Cont.)

23. COOPER, C. DAVID, Clausen, Christian A., Pettey, Lucas, Muller, Paul, and Collins, Michelle M. "Injection Nozzle for Ultraviolet Light-Enhanced H₂O₂ Oxidation of Air Pollutants in Flue Gas," ASCE J. of Environmental Engineering, 128, 12, 1175-1181 (2002).
24. COOPER, C. DAVID and Arbrandt, Marten. Mobile Source Emission Inventories – Monthly or Annual Average Inputs to MOBILE6?" Journal of the Air & Waste Management Association, 54, 8, 1006-1010 (2004).
25. Collins, Michelle M, COOPER C. DAVID, and Clausen Christian A. "Hydrogen Peroxide Enhances Removal of NO_x from Flue Gases," NASA Tech Briefs, 29, 1, 54-55 (Jan. 2005).
26. Limvoranusorn, Piyavadee, COOPER, C. DAVID, Dietz, John D., Clausen, Christian A., Pettey, Lucas, and Collins, Michelle M. "Kinetic Modeling of the Gas-Phase Oxidation of Nitric Oxide using Hydrogen Peroxide," ASCE J. of Environmental Engineering, 131, 4, 518-525 (April, 2005).
27. Imran, Syed A., Dietz, John D., Mutoti, Ginasiyo, Taylor, James S., Randall, Andrew A., and COOPER, C. DAVID. "Red Water Release in Drinking Water Distribution Systems," American Water Works Association Journal, 97, 9, 93-100 (Sept., 2005).
28. Mutoti, Ginasiyo, Dietz, John D., Imran, Syed, Taylor, James, and COOPER, C.D. "Development of a Novel Iron Release Flux Model for Distribution Systems," J. AWWA, 99, 1, 102-111 (Jan., 2007).

REPORTS:

1. COOPER, CHARLES DAVID, "The Theory and Practice of Perturbation Chromatography Applied to the Investigation of H₂ and CO Chemisorption on a CO-Mo-Al Catalyst," A Master's Thesis, Rice University, Houston, Texas, April 1971.
2. COOPER, C.D., "Computer Control of Product Octane at HF2," an internal company memorandum, Exxon Co., USA, August 1971.
3. COOPER, C.D., "Supervisory Computer Control of Reactor Regeneration at HF3," an internal company memorandum, Exxon Co., USA, December 1972.
4. COOPER, C.D., "Maximization of Gasoline Production at the Baytown Refinery," an internal company report, Exxon Co., USA, November 1973.

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5. COOPER, C.D., "Environmental Planning for the Treatment and Disposal of Hazardous Wastes in the East Central Florida Area," Fla. Technological University, August 1978.
6. COOPER, C.D., "Prediction of Time-Temperature Design Parameters for a Hydrocarbon Vapor Incinerator," a Ph.D. Dissertation presented to Clemson University, Clemson, South Carolina, 1980.
7. COOPER, C. DAVID, "Destruction of VOCs by a Catalytic Paint Drying (IR) Device," ORD Research Report, U.S. Environmental Protection Agency, EPA-600/2-85-064, Research Triangle Park, North Carolina, June 1985. Resume - C.D. Cooper
8. COOPER, C. DAVID, DIETZ, JOHN D., Flint, Mark J., and Todd, M.R., "Water Quality Characterization of an Eastern Coal Slurry," EPA/600/S2-87/016, U.S. Environmental Protection Agency, Cincinnati, Ohio, June 1987.
9. COOPER, C. DAVID, "Eight-Hour Carbon Monoxide Persistence Factors," report number FL-DOT/BMR-325-88, 97 pages, Florida Department of Transportation, Tallahassee, FL, May 1988.
10. COOPER, C. DAVID. "Carbon Monoxide Persistence Factors Near Intersections," a Final Report to Florida DOT, Report No. FL-DOT/MR-368, 64 pages, November 1989.
11. COOPER, C. DAVID. "Landfill Gas Emissions," a final report to FCSHWM, 59 pages, May, 1990.
12. COOPER, C. DAVID, "Enhanced Carbon Monoxide Screen Test," final report to FDOT, FI-ER-48-91, 26 pages, July, 1991.
13. Walker, Barry L. and COOPER, C. DAVID. "Air Pollution Emission Factors for Medical Waste Incinerators," a final report to the Florida Center for Solid and Hazardous Waste Management, 41 pages, November, 1991.
14. COOPER, C. DAVID; REINHART, DEBRA R.; Rash, Fred; Seligman, Debra; and Keely, Debra. "Landfill Gas Emissions." A final report to the Florida Center for Solid and Hazardous Waste Management, 136 pages, July 31, 1992.
15. COOPER, C. DAVID; WAYSON, ROGER L.; Brown, Kim; Moramganti, Rajshekar; Muthineni, Vinod. "Central Florida Ozone Study." A final report to the Florida Dept. of Environmental Protection, 101 pages, March 31, 1993.
16. COOPER, C. DAVID "MOBILE5A-Based Carbon Monoxide Screen Test", a final report to FDOT, 28 pages, October, 1993.

to FDOT, 98 pages, December, 1997.

Resume – C.D. Cooper (cont.)

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18. COOPER, C. DAVID, CLAUSEN, CHRISTIAN A., and DIETZ, JOHN. D. "A Pilot Scale Evaluation of a New Technology to Control NO_x Emissions from Boilers at KSC: Hydrogen Peroxide Injection into Boiler Flue Gases Followed by Wet Scrubbing of Acid Gases," a final report of Phase I Activities to NASA, 20 pages, October, 1998.
19. COOPER, C. DAVID, and Keely, Deb. "COSCREEN98 Update to Windows," a final report to FDOT, 35 pages, March, 1999.
20. COOPER, C. DAVID. "Estimating and Reporting Fugitive Air Emissions at Kennedy Space Center, Florida," a final report to NASA, 21 pages, December, 1999.
21. COOPER, C. DAVID, and CLAUSEN, CHRISTIAN A. "A Pilot Scale Evaluation of a New Technology to Control NO_x Emissions from Boilers at KSC: Hydrogen Peroxide Injection into Boiler Flue Gases Followed by Wet Scrubbing of Acid Gases," a final report of Phase II Activities to NASA, 41 pages, July, 2000.
22. COOPER, C. DAVID, and CLAUSEN, CHRISTIAN A. "A Pilot Scale Evaluation of a New Technology to Control NO_x Emissions from Boilers at KSC: Hydrogen Peroxide Injection into Boiler Flue Gases Followed by Wet Scrubbing of Acid Gases," a final report of Phase III Activities to NASA-KSC, 31 pages, November, 2001.
23. COOPER, C. DAVID and Keely, Debra K. "The Georgia CO Screening Model for Georgia Intersections," a final report to the Georgia DOT, 38 pages, February, 2002.
24. COOPER, C. DAVID. "Technical Support for Commercialization of Hydrogen Peroxide Injection to Control NO_x Emissions from Combustion Sources," a final report to the GCHSRC, 15 pages, April, 2002.
25. COOPER, C. DAVID, Keely, Debra K., and Jones, Steven L. "ALCO – the Alabama CO Screening Model and AM6 – Alabama MOBILE6," a final report to the Alabama Department of Transportation, 59 pages, November, 2003.

PRESENTATIONS AND CONFERENCE PROCEEDINGS:

1. Brown, John C., JR., and COOPER, C.D., "The Effects of Relaxed Emissions Standards and Heavy Duty Vehicles on Projected Highway Emissions Through 1990," a paper presented at the 71st Annual Meeting of the Air Pollution Control Association, Houston, Texas, June 1978.
2. DOERING, R.D., HOSNI, Y.A., and COOPER, C.D., "The Economics of Energy Management Systems in State Buildings in Florida," a paper presented to the American Society of Mechanical Engineers Winter Annual Meeting, December 1978.
3. Manderson, M.C. and COOPER, C.D., "Sulphur Supply and Demand and its

of the American Chemical Society, Atlanta, Georgia, March 29 - April 3, 1981. (Also published in ACS Symposium Series, 183, Amer. Chem. Soc., Washington, DC, 1982.)

Resume – C.D. Cooper (cont.)

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4. Manderson, M.C. and COOPER, C.D., "The World Supply/Demand Outlook," a paper presented at the Sulphur-81, an International Conference, Calgary, Alberta, Canada, May 24-28, 1981.
5. COOPER, C.D., Alley, F.C., and Mullins, J.C., "Kinetics of Hydrocarbon Vapor Incineration - Including Carbon Monoxide Formation and Destruction," a paper presented at the 1981 Annual Convention of the Florida Section, Air Pollution Control Association, Palm Coast, Florida, September 27-29, 1981.
6. COOPER, C.D., Alley, F.C., and Overcamp, T.J., "A General Model for Predicting Hydrocarbon Vapor Incineration Kinetics in an Afterburner," a paper presented at the 74th Annual Meeting of the AIChE in New Orleans, Louisiana, November 8-12, 1981.
7. COOPER, C.D., "A Microcomputer Model of an Equalization Basin," a paper presented at the ASCE 1982 Joint Florida/South Florida Annual Meeting, Orlando, Florida, September 2-5, 1982.
8. COOPER, C.D., "Air Pollution Education in Florida - Past, Present, and Future," a paper presented at the Annual Meeting of the Florida Air Pollution Control Association, Palm Beach Shores, Florida, September 25-27, 1983.
9. COOPER, C.D., DIETZ, J.D., TAYLOR, J.S., Flint, M.J., and Todd, M.R., "Water Quality Characterization of an Eastern Coal Slurry," a paper presented at the Second Conference on Municipal, Hazardous, and Coal Wastes Management, Miami Beach, Florida, December 5-7, 1983. (Also published in proceedings).
10. COOPER, C.D. and Manderson, M.C., "Phosphate Rock: The Emerging World and Regional Supply and Demand Outlook into the late 1980s," a paper presented at Phosphates - What Prospects for Growth, an Industrial Minerals International Conference, Orlando, Florida, December 11-14, 1983.
11. Manderson, M.C. and COOPER, C.D., "World Sulphur Supply Demand Overview to the Early 1990s," a paper presented at SULPHUR-84, an International Conference, Calgary, Alberta, Canada, June 3-6, 1984.
12. COOPER, C.D. and Nangle, J., "Destruction of VOCs by a Catalytic Paint Drying Device," a paper presented at the Annual Meeting of the Florida Air Pollution Control Association, Daytona Beach Shores, September 23-25, 1984.
13. COOPER, C.D., DIETZ, J.D., Flint, M.J., and Todd, M.R., "Water Quality Characterization of an Eastern Coal Slurry," a paper presented at the 10th International Conference on Slurry Technology, Lake Tahoe, Nevada, March 26-28, 1985.

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Resume – C.D. Cooper (cont.)

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15. Boyd, James C. and COOPER, C.D., "Survey of Indirect Source Carbon Monoxide Modeling with Emphasis on the East Central Florida Region," a paper presented at the Florida Section - APCA Annual Meeting, Clearwater Beach, Florida, Sept. 28-30, 1986.
16. COOPER, C. DAVID, "Indirect Source Modeling - Carbon Monoxide Impacts," a paper presented at the 1987 Specialty Conference of the ASCE, Orlando, FL. Also published in Proceedings of the 1987 Specialty Conference on Environmental Engineering, published by ASCE, New York, 1987.
17. COOPER, C. DAVID, "Meteorological and Vehicular Persistence Factors for Mobile Source Carbon Monoxide Modeling," a paper presented at the 81st Annual Meeting of APCA, Dallas, Texas, June 19-24, 1988.
18. COOPER, C. DAVID, and McCann, Robert, "Air Stripping of VOC's from Water: Implications for Air Quality," a paper presented at the Florida Section - APCA Annual Meeting, San Destin, Florida, September 25-27, 1988.
19. COOPER, C. DAVID, LEFTWICH, D. SCOT, and Liu, Pwu-Sheng, "Persistence Factors for Carbon Monoxide Modeling near Roadways and Intersections," a paper presented at the 68th Annual Meeting of the Transportation Research Board, Washington, D.C., January 22-26, 1989.
20. COOPER, C. DAVID, LEFTWICH, D. SCOT, and Liu, Pwu-Sheng. "Persistence Factors for Carbon Monoxide Modeling Near Intersections," a paper presented at the 82nd Annual Meeting of the AWMA, Anaheim, California, June 1989.
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22. COOPER, C. DAVID, MALONE, LINDA C., and Liu, Pwu-Sheng. "Pinning Down 'Worst-Case' Persistence Factors for Carbon Monoxide Modeling near Intersections in Orlando, Florida," a paper presented at the 84th Annual Meeting of the Air and Waste Management Association, Vancouver, Canada, June, 1991.
23. Walker, Barry L. and COOPER, C. DAVID. "Air Pollution Emission Factors for Medical Waste Incinerators," a paper presented at FAWMA Annual Conference, Clearwater Beach, Florida, September, 1991.
24. REINHART, DEBRA R., COOPER, C. DAVID, Walker, Barry, and Rash, Fred. "Municipal Solid Waste Landfill Gas Emissions Monitoring," a paper presented at FAWMA Annual Conference, Clearwater Beach, Florida, September, 1991.

Resume – C.D. Cooper (cont.)

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26. Martinez, AL, Geiger, Cherie, CLAUSEN, CHRIS A. and COOPER, C. DAVID. "Enhancement of the Kinetics of Incineration of Dilute Hazardous Organic Vapors by Addition of Hydrogen Peroxide or Ozone," a paper presented at the Annual FAWMA Conference Pensacola, Florida (Sept. 1992).
27. COOPER, C. DAVID, WAYSON, ROGER L., DIETZ, JOHN D., Bauman, Doug, Cheze, Kathleen, Sutch, P.J. "Atmospheric Releases of Formaldehyde from Electroless Copper Plating Operations," a paper presented to SURFIN-93, Anaheim, CA, July, 1993.
28. COOPER, C. DAVID, Reddy, Suresh. "MOBILE5A-Based Carbon Monoxide Screening Test for Preliminary Impact Analysis of Highway Projects in Florida," presented to the AWMA 1994 Annual Meeting, Cincinnati, Ohio, June 19-24, 1994.
29. MALONE, LINDA C., Liu, Pwu Sheng, COOPER, C. DAVID, WAYSON, ROGER L., AL-DEEK, HAITHAM. "A Comparison of Three Intersection CO Models on a Partitioned Combined Database," a paper presented to the AWMA 1995 Annual Meeting, San Antonio, Texas, June 18-23, 1995.
30. COOPER, C. DAVID, Keely, Debra K. "Determining Actual RVP Values of Gasoline Sold in Florida," a paper presented to the AWMA 1995 Annual Meeting, San Antonio, Texas, June 18-23, 1995.
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32. HOEKSTRA, ROBERT L., COOPER, C. DAVID, Keely, Debra K. "Vehicle Emissions of a Hydrogen-Enriched Compressed Natural Gas," a paper presented to the AWMA 1995 Annual Meeting, San Antonio, Texas, June 18-23, 1995.
33. COOPER, C. DAVID, et. al. "Second Progress Report on FLINT - the Florida INTERsection Model: Description and Preliminary Performance Evaluation," a paper presented to the AWMA 89 Annual Meeting, Nashville, Tennessee, June 23-28, 1996.
34. AL-DEEK, HAITHAM M., WAYSON, ROGER L., COOPER, C. DAVID, Keely, Debra, Traynelis, Richard, Liu, Pwu-Sheng, MALONE, LINDA C. "A Queueing Algorithm for Calculating Idling Emissions in FLINT - the FLorida INTersection Air

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36. Tazi, L.M., M. Collins, Q.D. Nguyen, C.D. COOPER, and C.A. CLAUSEN, "Hydrogen Peroxide Enhanced Oxidation and Removal of Nitrogen Oxides from Flue Gases", a paper presented at the 62nd meeting of the Florida Academy of Science, Orlando, FL, March 1997.
37. COOPER, C. DAVID, and Nguyen, Quang. "A Progress Report on Pilot Study Control of NO_x Emissions from Boilers Using H₂O₂," a paper presented to the Annual Meeting of the Florida Air & Waste Management Association, Stuart, Florida, September, 1997.
38. WAYSON, ROGER L., COOPER, C. DAVID, Brenner, Marta Lynne, Kim, Brian Y., and Datz, Amy. "A Determination of Hot and Cold Start Percentages for the State of Florida to be Used in Mobile Source Emissions," a paper presented to the Transportation Research Board, 77th Annual Meeting, Washington, D.C., January 11-15, 1998.
39. Tazi, L.M., Collins, M., Nguyen, Q.D., COOPER, C.D., and CLAUSEN, C.A. "Hydrogen Peroxide Enhanced Oxidation and Removal of Nitrogen Oxides from Flue Gases," a paper presented at the 62nd meeting of the Florida Academy of Science, Winter Park, FL, March, 1998.
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41. COOPER, C. DAVID, Kim, Brian., McDonald, John "Estimating the Lower Heating Value of Solid and Hazardous Wastes," a paper presented to the Annual Meeting of the Florida AWMA, St. Augustine, FL. September 1998.
42. COOPER, C. DAVID, CLAUSEN, CHRIS A., Collins, Michelle, Tazi, Loubna, and Nguyen, Quang. "A Pilot-scale Evaluation of a New Technology to Control NO_x Emissions from Boilers at KSC: Hydrogen Peroxide Injection into Boiler Flu Gases Followed by Wet Scrubbing of Acid Bases," a paper presented to the First Annual NASA-KSC Partners in Education and Research Conference, Cocoa Beach, FL, October 6-8, 1998.

Resume – C.D. Cooper (cont.)

PRESENTATIONS AND CONFERENCE PROCEEDINGS: (Cont.)

43. Collins, Michelle, COOPER, C. DAVID, CLAUSEN, CHRISTIAN, Tazi, Loubna, and Nguyen, Quang. "A New Technology for Control of Nitrogen Oxides Emissions from Stationary Combustion Sources," a paper presented at the Pacific Northwest Section of the Air & Waste Management Association, Seattle, WA, Nov. 4, 1998.
44. Keely, Debra K. and COOPER, C. DAVID. "The Advancement of CO Screening Models," a paper presented at the 1999 Annual Meeting of the Air & Waste Management Association, St. Louis, Missouri, June 20-25, 1999.
45. Collins, Michelle, COOPER, C. DAVID, CLAUSEN, CHRISTIAN, Tazi, Loubna, and Nguyen, Quang. "A New Technology for Control of Nitrogen Oxides Emissions from Stationary Combustion Sources," a paper presented at the 1999 Annual Meeting of the Air & Waste Management Association, St. Louis, Missouri, June 20-25, 1999.
46. Chambers, Rachel, and COOPER, C. DAVID. "Monitoring and Modeling of Air Quality: Development of Empirical Ozone Models for the East Central Florida and Pensacola, Florida Airsheds," a paper presented at the 2001 Annual Meeting of the Air & Waste Management Association, Orlando, FL, June 24-28, 2001.
47. ABDEL-ATY, M, Aiouche, H, COOPER, C. D., Miller, R, and Abdelwahab, H. "Investigating Vehicle Occupancy Rates on Toll Roads: Empirical Results from an Origin-Destination Study and its Implications on Air Quality," a paper presented at the 2001 Annual Meeting of the Air & Waste Management Association, Orlando, FL, June 24-28, 2001.
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49. COOPER, C. D. and Keely, Debra K. "Using MOBILE6 to Get Emission Factors for a Microscale CO Analysis," a paper presented at the 95th Annual Conference of the Air & Waste Management Association, Baltimore, Md, June 24-27, 2002.
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51. COOPER, C. DAVID, Keely, Debra K, and Jones, Steven L. "Alabama Mobile6 – A Customized Windows Interface," a paper presented at the 96th Annual Conference of the Air & Waste Management Association, San Diego, CA, June 22-26, 2003.
52. COOPER, C. DAVID, Keely, Debra K, Gawalpanchi, Sheetal, and Jones, Steven L.

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Resume – C.D. Cooper (cont.)

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53. Rahmani, Mariam, and COOPER, C. DAVID. “Dispersion of a Dense Gas in a Closed Space,” a paper presented at the 97th Annual Conference of the Air & Waste Management Association, Indianapolis, IN, June 22-25, 2004.
54. COOPER, C. DAVID and Arbrandt, Marten. “Annual Average vs Monthly Average Values for Selected Inputs to MOBILE6 – Effect on an Annual Emissions Inventory,” a paper presented at the 97th Annual Conference of the Air & Waste Management Association, Indianapolis, IN, June 22-25, 2004.
55. COOPER, C. DAVID and Ferraro, Bruno. “CO Modeling and Monitoring in Orlando, Florida,” a paper presented at the Annual Meeting of the Florida Air & Waste Management Association, St. Petersburg Beach, Florida, November 20-22, 2005.
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