



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON D.C. 20460

OFFICE OF THE ADMINISTRATOR
SCIENCE ADVISORY BOARD

March 11, 2008

Memorandum

SUBJECT: Formation of Clean Air Scientific Advisory Committee (CASAC)
Carbon Monoxide Review Panel

FROM: Kyndall Barry */Signed/*
Designated Federal Officer (DFO)
EPA Science Advisory Board Staff Office (1400F)

TO: Vanessa Vu, Ph.D.
Director
EPA Science Advisory Board Staff Office (1400F)

VIA: Daniel Fort */Signed/*
Ethics & FACA Policy Officer
EPA Science Advisory Board Staff Office (1400F)

Under the Clean Air Act (CAA), the Environmental Protection Agency (EPA) is required to carry out a periodic review and revision, where appropriate, of the National Ambient Air Quality Standards (NAAQS) for criteria pollutants. In response to the request of EPA's Office of Air and Radiation (OAR) and Office of Research and Development (ORD), the SAB Staff Office has formed the Clean Air Scientific Advisory Committee (CASAC) Carbon Monoxide Review Panel to provide independent scientific advice in the review of the primary (health-based) NAAQS for carbon monoxide (CO). Over the next three to four years, the Panel will review EPA's technical assessments as the basis for possible revision of the CO NAAQS.

This memorandum addresses the set of determinations that were necessary for forming the CASAC CO Review Panel including:

- The expertise needed to address the charge;
- Conflict of Interest Considerations;
- Appearance of Lack of Impartiality;
- How individuals were selected for the Panel.

1) Expertise Requested:

On 12 October 2007 the EPA SAB Staff Office announced in the *Federal Register* (72 FR 58078) the formation of the CASAC CO Review Panel (Panel) and solicited nominations to supplement the chartered CASAC (Attachment 1). The expertise sought included: atmospheric science; exposure modeling; risk assessment modeling; dosimetry; toxicology; controlled human exposure; epidemiology; and biostatistics. On the basis of the candidates' credentials and willingness to serve on the panel, the SAB Staff Office identified fifteen (15) nominees for the "Short List" of candidates.

On 5 February 2008, the SAB Staff Office posted a notice on the SAB Web site inviting public comments on the "Short List" candidates under consideration to serve on the Panel (Attachment 2). In particular, the notice stated that the Staff Office would welcome any relevant information, analysis or other documentation for the consideration of the SAB Staff Office in making the final decision about the CASAC CO Panel. The notice asked that any advice, observations, or comments be provided to the SAB Staff Office no later than 26 February 2008. The SAB Staff Office received no comments on the "Short List" candidates.

2) Conflict of Interest Considerations:

For Financial Conflict of Interest (COI) issues, 18 U.S.C. § 208 provision states that:

"An employee is prohibited from participating *personally and substantially* in an official capacity in any *particular matter* in which he, to his knowledge, or any person whose interests are imputed to him under this statute has a financial interest, if the particular matter will have a *direct and predictable effect* on that interest [emphasis added]."

For a conflict of interest to be present, all elements in the above provision must be present. If an element is missing the issue does not involve a formal conflict of interest; however, the general provisions in the appearance of impartiality guidelines must still apply and need to be considered.

Personal and Substantial Participation:

Participating personally means participating directly. Participating substantially refers to involvement that is of significance to the matter. [5C.F.R. 2640.103(a)(2)]. For this review, the EPA SAB Staff Office has determined that the CASAC CO Review Panel will be participating personally in the matter. Panel members will be providing the Agency with advice and recommendations that is expected to include an assessment as to whether the proposed air quality criteria accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health, which may be expected from the presence of this pollutant (that is, CO) in the ambient air. Therefore, participation in this review will also be substantial.

Direct and Predictable Effect:

A direct effect on a participant's financial interest exists if, "... a close causal link exists between any decision or action to be taken in the matter and any expected effect of the matter on the financial interest... A particular matter does not have a direct effect...if the chain of causation is attenuated or is contingent upon the occurrence of events that are speculative or that are independent of, and unrelated to, the matter. A particular matter that has an effect on a financial interest only as a consequence of its effects on the general economy is not considered to have a direct effect." [5 C.F.R. 2640.103(a)(i)]. A predictable effect exists if, "...there is an actual, as opposed to a speculative, possibility that the matter will affect the financial interest." [5 C.F.R. 2640.103(a)(ii)].

Particular Matter:

A "particular matter" refers to matters that "...will involve deliberation, decision, or action that is focused upon the interests of specific people, or a discrete and identifiable class of people." It does not refer to "...consideration or adoption of broad policy options directed to the interests of a large and diverse group of people." [5 C.F.R. 2640.103(a)(1)].

The CASAC CO Review Panel's activity in addressing the charge for the review of the technical documents will qualify as a *particular matter of general applicability* because the resulting advice will be part of a deliberation, and under certain circumstances the advice could involve the interests of a discrete and identifiable class of people but does not involve specific parties. That group could be comprised of those who are associated or involved with the potentially interested or affected parties including: (1) EPA; (2) State, regional and local air program (or air pollution control) agencies, and State regulatory officials; (3) State and local health officials; (4) research universities; (5) environmental interest groups/non-Governmental organizations (NGOs); (6) potentially responsible parties (PRP) and their contractors; and (7) various industry sectors interested in, or affected by, the current or any revised NAAQS for CO, including the power-generating and automotive industries.

3) Appearance of a Lack of Impartiality Considerations:

The Code of Federal Regulations [5 C.F.R. 2635.502(a)] states that:

"Where an employee knows that a *particular matter* involving specific parties is likely to have a *direct and predictable effect* on the financial interest of a member of his household, or knows that a person with whom he has a covered relationship is or represents a party to such matter, and where the person determines that the circumstances would cause a *reasonable person* with knowledge of the relevant facts to question his impartiality in the matter, the employee should not participate in the matter unless he has informed the agency designee of the appearance problem and received authorization from the agency designee."

Further, 5 C.F.R. 2635.502(a)(2) states that:

"An employee who is concerned that circumstances other than those specifically described in this section would raise a question regarding his impartiality should use the

process described in this section to determine whether he should or should not participate in a particular matter.”

To evaluate any potentially appearance of a lack of impartiality, the following four (4) questions were posed to prospective panel members:

- (a) Have you had any involvement with the development of EPA documents regarding this subject, including authorship, collaboration with the authors, or review functions?
- (b) Have you served on previous EPA (or non-EPA) advisory panels/committees that addressed the subject of review?
- (c) Have you made any public statements (written or oral) or taken a position on the subject of review?
- (d) Do you know of any reason that you might be unable to provide impartial advice on the subject of review or any reason that your impartiality in the matter might be questioned?

4) How individuals were selected for the final Panel:

Prospective advisory panel members were asked to submit a confidential financial disclosure form (EPA Form 3110-48, “Confidential Financial Disclosure Form for Special Government Employees Serving on Federal Advisory Committees at the U.S. Environmental Protection Agency) in addition to the response to the above-stated four (4) questions. The Deputy Ethics Official of the Science Advisory Board, in consultation with the SAB Ethics and FACA Policy Officer, has determined that there are no conflicts of interest or appearance of a lack of impartiality for the members of this panel.

The SAB Staff Office Director makes the final decision about who serves on the CASAC CO Review Panel, based on all relevant information. Specific criteria to be used in evaluating an individual Panel member include: (a) scientific and/or technical expertise, knowledge, and experience (primary factors); (b) availability and willingness to serve; (c) absence of financial conflicts of interest; (d) absence of an appearance of a lack of impartiality; and (e) skills working in committees, subcommittees and advisory panels; and, for the Panel as a whole, (f) diversity of, and balance among, scientific expertise, viewpoints, *etc.*

On the basis of the above-specified criteria and the review of all relevant information, the CASAC CO Review Panel is as follows:

Members of the statutory (chartered) Clean Air Scientific Advisory Committee:

- Dr. Rogene Henderson**, Lovelace Respiratory Research Institute (NM) – Chair
- Dr. Ellis B. Cowling**, North Carolina State University (NC)
- Dr. James D. Crapo**, National Jewish Medical and Research Center (CO)
- Dr. Douglas Crawford-Brown**, University of North Carolina at Chapel Hill (NC)
- Dr. Donna Kenski**, Lake Michigan Air Directors Consortium (IL)
- Dr. Armistead (Ted) Russell**, Georgia Institute of Technology (GA)
- Dr. Jonathan M. Samet**, Johns Hopkins University (MD)

ATTACHMENT 1

[Federal Register: October 12, 2007 (Volume 72, Number 197)]

[Notices]

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ENVIRONMENTAL PROTECTION AGENCY

[FRL-8481-6]

Science Advisory Board (SAB) Staff Office; Clean Air
Scientific Advisory Committee (CASAC) Carbon Monoxide
Review Panel; Request for Nominations

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: The U.S. Environmental Protection Agency (EPA or Agency) Science Advisory Board (SAB) Staff Office is announcing the formation of the Clean Air Scientific Advisory Committee (CASAC) Carbon Monoxide Review Panel (or Panel). The Panel will provide advice to the EPA Administrator regarding the primary national ambient air quality standards (NAAQS) for carbon monoxide (CO). The SAB is hereby soliciting nominations of technical experts for Panel membership.

DATES: New nominations should be submitted by November 2, 2007.

FOR FURTHER INFORMATION CONTACT: Any member of the public wishing further information regarding this Request for Nominations may contact Ms. Kyndall Barry, Designated Federal Officer (DFO), EPA Science Advisory Board (1400F), U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW., Washington, DC 20460; via telephone/voice mail: (202) 343-9868; fax: (202) 233-0643; or e-mail at:

barry.kyndall@epa.gov. General information concerning the CASAC or the EPA Science Advisory Board can be found on the EPA Web site at: <http://www.epa.gov/sab>.

SUPPLEMENTARY INFORMATION:

Background: The Clean Air Scientific Advisory Committee (CASAC) was established under section 109(d)(2) of the Clean Air Act (CAA or Act)(42 U.S.C. 7409) as an independent scientific advisory committee. The CASAC provides advice, information and recommendations on the scientific and technical aspects of air quality criteria and national ambient air quality standards (NAAQS) under sections 108 and 109 of the Act. The CASAC is a

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Federal advisory committee chartered under the Federal Advisory Committee Act (FACA), as amended, 5 U.S.C., App.

Section 109(d)(1) of the Clean Air Act (CAA) requires that EPA carry out a periodic review and revision, as appropriate, of the air quality criteria and the NAAQS for the six ``criteria'' air pollutants, including CO. The current primary NAAQS for CO was first promulgated in 1971 and retained in 1985 and 1994. EPA is currently preparing to update and revise, where appropriate, the air quality criteria for CO. Information on the Agency's plans to prepare an Integrated Science Assessment (ISA) as part of the review of the NAAQS for CO is contained in a recent Federal Register notice published on September 13, 2007 ([72 FR 52369-52371](#)).

This Federal Register notice solicitation is seeking nominations for additional, subject-matter experts to augment the chartered CASAC. The Panel will review EPA's scientific, technical, and policy assessments that form the basis for the Agency's review of the NAAQS for carbon monoxide. The Panel will comply with the provisions of FACA and all appropriate EPA and SAB Staff Office procedural policies.

Expertise Sought: In response to the Agency's request, the SAB Staff Office is soliciting nominees who are nationally-recognized experts regarding carbon monoxide in one or more of the following disciplines:

(1) Atmospheric Science. Expertise in physical/chemical properties of carbon monoxide and atmospheric processes

involved in the formation, transport on urban to global scales, transformation and fate of this pollutant in the atmosphere, and movement of the pollutant between media through deposition and other mechanisms. Also, expertise in the evaluation of natural and anthropogenic sources and emissions of carbon monoxide, pertinent monitoring or measurement methods for this pollutant, and spatial and temporal trends in the atmospheric concentrations.

(2) Exposure Modeling. Expertise in measuring human population exposure to carbon monoxide and/or in modeling human exposure from ambient and indoor sources.

(3) Risk Assessment Modeling. Expertise in human health risk analysis modeling for carbon monoxide related to cardiovascular and other non-cancer health effects.

(4) Dosimetry. Expertise in evaluation of the dosimetry of animal and human subjects, including identification of factors determining differential patterns of inhalation and/or deposition/uptake in respiratory tract regions that may contribute to differential susceptibility of human population subgroups and animal-to-human dosimetry extrapolations.

(5) Toxicology. Expertise in evaluation of experimental laboratory animal studies and in vitro studies of the effects of carbon monoxide on cells, tissues and organ systems.

(6) Controlled Human Exposure. Expertise in evaluation of controlled human exposure studies of the effects of carbon monoxide on healthy individuals as well as those with pre-existing cardiopulmonary disease.

(7) Epidemiology. Expertise in epidemiologic evaluation of the effects of exposures to ambient carbon monoxide and/or other major air pollutants (e.g., particulate matter, ozone) on human population groups, including mortality and morbidity effects.

(8) Biostatistics. Biostatistics related to exposures to ambient carbon monoxide and/or other major air pollutants (e.g., particulate matter, ozone) on human population groups, including mortality and morbidity effects and/or health risk analysis.

Process and Deadline for Submitting Nominations: Any interested person or organization may nominate qualified individuals for consideration for membership on the CO Review Panel in the areas of expertise described above.

Nominations should be submitted in electronic format through the SAB Web site at the following URL: <http://www.epa.gov/sab> directly via the nomination form, the Form for Nomination to Panel or Committee Being Formed. Please follow the instructions for submitting nominations carefully. To be considered, nominations should include all of the information required on the associated forms. Anyone unable to submit nominations using the electronic form and who has any questions concerning the nomination process may contact Ms. Kyndall Barry, DFO, as indicated above in this notice. Nominations should be submitted in time to arrive no later than November 2, 2007.

To be considered, all nominations should include: A current curriculum vitae (C.V.) which provides the nominee's background, qualifications, research expertise and relevant publications for service on the Panel; and a brief biographical sketch ('`biosketch''). The biosketch should be no longer than two paragraphs and should contain the following information for the nominee:

(a) Current professional affiliations and positions held;

(b) Educational background, especially advanced degrees, including when and from which institutions these were granted;

(c) Area(s) of expertise, and research activities and interests relevant to the Panel; and

(d) Leadership positions in national associations or professional publications or other significant distinctions and service on other advisory committees or professional societies, especially those associated with issues under discussion in this review.

The Web form will also request information about sources of recent (i.e., within the preceding two years) grant and/or other contract support, from government, industry, academia, etc., including the topic area of the funded activity. Please note that even negative responsive information (e.g., no recent grant or contract funding) should be indicated on the biosketch (by '`N/A' or '`None''). Incomplete biosketches will not be considered. The EPA SAB Staff Office will acknowledge receipt of nominations.

The scientific expertise and credentials of nominees received in reply to this notice will be reviewed for demonstrative experience in the disciplines sought for the

CO Review Panel. Qualified nominees will be included in a smaller subset (known as the ``Short List''). The Short List will be posted on the SAB Web site at: <http://www.epa.gov/sab>, and will include, for each candidate, the nominee's name and their biosketch. Public comments on the Short List will be accepted for a minimum of 21 calendar days. During this comment period, the public will be requested to provide relevant information or other documentation on nominees that the SAB Staff Office should consider in evaluating candidates. Panel members will be selected from the Short List.

For the EPA SAB Staff Office, a balanced subcommittee or review panel includes candidates who possess the necessary domains of knowledge, the relevant scientific perspectives (which, among other factors, can be influenced by work history and affiliation), and the collective breadth of experience to adequately address the charge. In establishing the final CO Review Panel, the SAB Staff Office will consider public responses to the Short List, information provided by candidates, and background information independently-gathered by the SAB Staff Office on each candidate (e.g., financial disclosure information, and computer searches to evaluate a

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nominee's prior involvement with the topic under review). Specific criteria to be used in evaluating Short List candidates for Panel membership include: (a) Scientific and/or technical expertise, knowledge, and experience (primary factors); (b) availability and willingness to serve; (c) absence of financial conflicts of interest; (d) absence of an appearance of a lack of impartiality; and (e) skills working on committees, subcommittees and advisory panels; and, for the Panel as a whole, (f) diversity of, and balance among, scientific expertise, viewpoints, etc.

Prospective candidates will also be required to fill-out the ``Confidential Financial Disclosure Form for Special Government Employees Serving on Federal Advisory Committees at the U.S. Environmental Protection Agency'' (EPA Form 3110-48). This confidential form allows Government officials to determine whether there is a

statutory conflict between that person's public responsibilities (which includes membership on an EPA Federal advisory committee) and private interests and activities, or the appearance of a lack of impartiality, as defined by Federal regulation. The form may be viewed and downloaded from the following URL address:
<http://www.epa.gov/sab/pdf/epaform3110-48.pdf>.

The approved policy under which the EPA SAB Office selects subcommittees and review panels is described in the following document: Overview of the Panel Formation Process at the Environmental Protection Agency Science Advisory Board (EPA-SAB-EC-02-010), which is posted on the SAB Web site at: <http://www.epa.gov/sab/pdf/ec02010.pdf>.

Dated: October 5, 2007.
Anthony F. Maciorowski,
Deputy Director, EPA Science Advisory Board Staff Office.

ATTACHMENT 2
Invitation for Comment on the Short List Candidates for the
Clean Air Scientific Advisory Committee (CASAC)
Carbon Monoxide Review Panel
5 February 2008

The EPA Science Advisory Board (SAB) Staff Office is forming the Clean Air Scientific Advisory Committee (CASAC) Carbon Monoxide Review Panel (Panel). The Panel will provide advice to the EPA Administrator regarding the primary national ambient air quality standards (NAAQS) for carbon monoxide (CO). Nominations for technical experts to augment the chartered CASAC were requested in a 12 October 2007 *Federal Register* Notice (72 FR 58078). Individuals with expertise regarding carbon monoxide in one or more of the following areas were sought: atmospheric science; exposure modeling; risk assessment modeling; dosimetry; toxicology; controlled human exposure; epidemiology; and biostatistics.

Biosketches of the seven members of CASAC are available at: <http://yosemite.epa.gov/sab/sabpeople.nsf/WebCommittees/CASAC>. Below are the biosketches for the fifteen candidates under consideration. We hereby invite comments from members of the public for relevant information, analysis or other documentation for the consideration of the SAB Staff Office in making the final decision about the CASAC CO Panel.

Information furnished by the public in response to this Web site posting will be combined with information provided by the nominee and information gathered independently by the SAB Staff Office. For the SAB Staff Office, a balanced subcommittee or review panel includes nominees with the necessary domains of knowledge, the relevant scientific perspectives (which, among other factors, can be influenced by work history and affiliation), and the collective breadth of experience to adequately address the charge. Specific criteria to be used in evaluating an individual Panel member include: (a) scientific and/or technical expertise, knowledge, and experience; (b) availability and willingness to serve; (c) absence of financial conflicts of interest; (d) absence of an appearance of a lack of impartiality; and (e) skills working in committees, subcommittees and advisory panels; and, for the Panel as a whole, (f) diversity of, and balance among, scientific expertise, viewpoints, etc. The SAB Staff Office Director makes the final decision concerning who will serve on the CASAC CO Review Panel.

Please provide any comments no later than 26 February 2008. Please make your comments to the attention of Ms. Kyndall Barry, Designated Federal Officer (DFO), at: barry.kyndall@epa.gov.

CASAC Carbon Monoxide NAAQS Review Panel

Alexeeff, George

California Environmental Protection Agency

Dr. Alexeeff is currently Deputy Director for Scientific Affairs, Office of Environmental Health Hazard Assessment, CAL/EPA. From 1990 – 1998 he served as Chief, Air Toxicology and Epidemiology Section, California Office of Environmental Health Hazard Assessment, CAL/EPA. From 1988- 1990 he served as Chief of the Air Toxics Unit, California Department of Health Services (CDHS). From 1989 – 1990 Dr. Alexeeff was Acting Chief, Hazard Evaluation Section, CDHS. He was staff Toxicologist at CDHS from 1986-1988. He was a toxicologist at the California Public Health Foundation from 1985 – 1986, and he was a toxicologist in combustion toxicology, Research and Development at Weyerhaeuser Company from 1983-1985. Dr. Alexeeff received a Ph.D. in Pharmacology and Toxicology from the University of California at Davis in 1982, and a B.A. in Chemistry from Swarthmore College in 1976. He has been certified as a Diplomat of the American Board of Toxicology, Inc., (DABT) since 1986. In his current position Dr. Alexeeff is responsible for supervising activities in the following areas: identification of carcinogens and reproductive toxins in the environment; review of epidemiological and toxicological data to identify hazards and derive risk-based assessments; development of guidelines to identify chemicals hazardous to the public and compounds to which infants and children may have increased susceptibility; recommending ambient air quality standards for California; identifying toxic air contaminants; characterizing air toxics hot spots; developing public health goals for contaminants in water; preparing Proposition 65 evaluations for carcinogens and developmental/reproductive toxins; issuing sport fish consumption advisories to the public; conducting epidemiological studies or investigations, developing indicators of environmental quality; pesticide poisoning illness surveillance, training health personnel on pesticide poisoning recognition; reviewing hazardous waste site risk assessments; and conducting multi-media risk assessments. Dr. Alexeeff has coauthored numerous health evaluations based on epidemiological and toxicological data. He has reviewed over 140 documents evaluating human epidemiological or animal toxicological evidence for the Office of Environmental Health Hazard Assessment or other agencies such as U.S. EPA. Dr. Alexeeff's professional activities and have included: President, Genetic and Environmental Toxicology Association of Northern California, 1995; Society of Toxicology member since 1981; Charter member and coorganizer of the Northern California, Chapter of the Society of Toxicology; Charter member of the Pacific Northwest Chapter of the Society of Toxicology; Consultant to OEHHA and DHS for the Research Scientist and Staff toxicologist classifications; member of the Toxicology Council for National Foundation for Applied Combustion, member of American Society for Testing and Materials' Task Groups; Member of International Standards Organization's, Task Group on combustion toxicology; Member of the American Chemical Society Chemical Health and Safety subsection.

Belcher, Anthony

Wes-Tech Environmental

Anthony Belcher is currently with Wes-Tech Environmental, and is a Certified Hazardous Materials Specialist, and an Industrial Hygienist. He is also a Licensed Certified Asbestos Consultant and a California Certified Asbestos Training Provider. Mr. Belcher has fifteen years experience in Environmental Hygiene CEQA/NEPA, air quality control, soil and water compliance and resource assessment and has extensive knowledge of CAL-OSHA, CAL-EPA, NIOSH, and NESHAP regulations. Mr. Belcher has extensive experience in reviewing and confirming sampling and analysis plans, site characterization reports, health and safety plans, and providing direct oversight to all field works. He coordinates and supervises on-site remediation, engineering and removal of hazardous wastes and ensures compliance with specifications and regulatory requirements. He was previously appointed to serve on the Sacramento County Board of Supervisors to the Building Standards Board (1993-1994) and the Sacramento County Board of Supervisors County Justice System Advisory Group (1989-1991). Mr. Belcher received a A.S. from Sacramento City College in 1987.

Choi, Augustine

Harvard Medical School

Dr. Augustine Choi is Chief of Pulmonary and Critical Care Medicine at the Brigham and Women's Hospital and Distinguished Parker B. Francis Professor of Medicine at the Harvard Medical School. Dr. Choi previously served as a Professor of Medicine and Chief of Pulmonary, Allergy and Critical Care Medicine at the University of Pittsburgh's School of Medicine. Prior to his work at the University of Pittsburgh, Dr. Choi was an Associate Professor of Medicine in the Section of Pulmonary and Critical Care Medicine at Yale University's School of Medicine and the Director of Lung Research. Before that, Dr. Choi was an Assistant Professor in the Division of Pulmonary and Critical Care Medicine at The Johns Hopkins University School of Medicine (1992-1998), where he earned the Dean Ross Scholar Award (1994-1996) and a Visiting Scientist to the Laboratory of Molecular Genetics, at NIA/NIH (1990-1993). Dr. Choi's training began with a BS in Biology from the University of Kentucky (1980) where he graduated Summa Cum Laude and earned the Seniors Honors Award. He later earned his MD from the University of Louisville School of Medicine (1984), where he was a member of Alpha Omega Alpha. After completing his residency in Internal Medicine at Duke University Medical Center (1984-1987), Dr. Choi was a fellow at The Johns Hopkins University, School of Medicine, (1987-1990). Dr. Choi has received many honors and awards throughout his career, including the AHA Established Investigator Award (1998-2001) and the Physician Scientist Award (1991). Dr. Choi's research interests are extensive, and a major focus of his clinical practice is in the diagnosis and treatment of ARDS and COPD. His research has focused on the regulation and function of stress response genes and antioxidant enzymes in response to oxidative stress and inflammation. The molecular regulation and function of anti-oxidant enzymes, in particular heme oxygenase-1 and gaseous molecule carbon monoxide, has been a specific area of extensive examination in a variety of in vitro and in vivo models of lung diseases such as ARDS. His laboratory also focuses on the improved understanding of the pathogenesis of COPD by means of using functional genomics approach such as gene expression profiling studies. He continually strives to foster a better understanding of various pulmonary disorders and to improve current medicinal practices used to treat lung disease and injury. He has authored or co-authored well over 100 articles depicting his research findings.

Dahms, Thomas

St. Louis University

Thomas E. Dahms, Ph.D., is a professor in the Department of Anesthesiology and Critical Care at St. Louis University Medical School. He holds secondary appointments in the Department of Internal Medicine (Division of Pulmonology, Critical Care and Sleep Medicine) and in the Department of Surgery. He has been actively involved in Carbon Monoxide research for nearly 40 years. He served as corresponding author for publications relating to the health effects of low levels of CO on individuals with cardiovascular disease. Dr. Dahms has expertise in the measurement of endogenous levels of CO in blood. Dr. Dahms served as a consultant to the EPA in 1990-91 and again in 1998-99 for the purposes of drafting the documents relating to the Air Quality Criteria for Carbon Monoxide. Additional research interests of Dr. Dahms focus on the impact of inflammation in the pulmonary circulation and air ways on gas transfer in the lung.

Dickerson, Russell R.

The University of Maryland, College Park

Russell R. Dickerson received his AB in 1975 from the University of Chicago and his Ph.D. in 1980 from The University of Michigan, where he studied the interaction of radiation and trace gases in the atmosphere. After graduation, he worked with Nobel Laureate Paul Crutzen in the Air Chemistry Division at NCAR and in the Abteilung Luftchemie at the Max Planck Institute in Mainz, Germany. Professor Dickerson began working in the Department of Meteorology as an Assistant Professor in 1983 as the sole atmospheric chemist. He built the program in atmospheric chemistry and air pollution to include six faculty, several post docs and more than a dozen graduate students. His research has expanded to include the interactions of weather phenomena such as thunderstorms and atmospheric chemistry, ocean-atmosphere interactions, air pollution, the links between particulate and gaseous chemistry and global biogeochemical cycles. His research group, composed of meteorologists, engineers, and chemists, develops analytical instruments (for species such as NO_x, CO, NH₃, aerosols, and for photolysis rate measurements), employs these instruments in the laboratory, field, and on ships and aircraft, and interprets the results in terms of photochemistry, heterogeneous processes, and atmospheric physics with the aid of numerical chemical transport and cloud models. He has won external funding awards in excess of \$10M from MDE, NSF, NOAA, EPA, DOE, NASA and private industry. More recently, remote sensing from satellites has been added to better extrapolate from in situ observations to large-scale processes and climate impacts. Among the more exciting recent discoveries are smoke pall from South Asia, rapid ozone destruction in the marine boundary layer, the impact of aerosol radiative forcing on air quality, and the dry convection as a major mechanism in inter-hemispheric transport of air pollution from China. He has helped define, plan, and execute the Atmosphere Ocean Chemistry Experiment (AEROCE), and the Indian Ocean Experiment (INDOEX), and served as the Chief Scientist on the R/V Ronald Brown. He served on the steering committees of Center for Clouds Chemistry and Climate (C4), INDOEX, NARSTO, and BASE-ASIA. Professor Dickerson was a member of the National Academy of Sciences National Research Council Committee on Animal Feeding Operations and has helped write a NRC Report on the impact of agriculture on air pollution in the US. He has been a coauthor of the EPA Criteria Documents for CO, O₃ and PM, contributing the sections on analytical techniques and interpretation of results from field experiments. He serves on the Maryland Climate Change Commission. In teaching, Professor Dickerson developed courses in Air Pollution (AOSC 434), Atmospheric Chemistry (AOSC/CHEM 637) and Air Sampling and Analysis (AOSC/CHPH 634). He has directed research for 14 B.S., 13 M.S., and 19 Ph.D. degrees in METO(AOSC), CHEM and CHPH. The Regional Atmospheric Measurement, Modeling and Prediction Program (RAMMPP) that he heads acts as the scientific arm of the Maryland Department of the Environment and Department of Natural Resources concerning air quality issues in the Mid-Atlantic region. RAMMPP makes air quality forecasts, emissions estimates, aircraft measurements, and helps develop plans for compliance with the Clean Air Act such as State Implementation Plans (SIPS). He is co-director of EAST-AIRE, East Asian Study of Tropospheric Aerosol: International Regional Experiment where the first aircraft measurements of air pollutants over China were made. Dickerson serves on various committees including the Science Advisory Committee of the Texas Environmental Research Consortium. The Chronicle of Higher Education ranked AOSC as the 4th best program in the US in 2007, the last year in which Prof. Dickerson chaired the Department; see: <http://chronicle.com/stats/productivity/page.php?year=2007&primary=4&secondary=130&bycat=Go>.

Fechter, Laurence

Loma Linda University

Dr. Laurence Fechter has been a Research Scientist at the Jerry L. Pettis Memorial VA Medical Center in Loma Linda, CA since 2002 and holds a Research Professorship in the Department of Surgery at the Loma Linda University School of Medicine. Prior to taking these positions, Dr. Fechter was the Mosier Centennial Professor of Toxicology and Director of the Oklahoma Center for Toxicology at the University of Oklahoma Health Sciences Center (1993-2002). His first academic position was in the Department of Environmental Health Sciences at the Johns Hopkins School of Hygiene and Public Health (1976-1993) where he attained the rank of Professor of Environmental Toxicology. Dr. Fechter obtained his Ph.D. from the University of Rochester (1973) in the fields of Neurosciences/Biopsychology and undertook post-doctoral training in the Medical Pharmacology Institute at the University of Uppsala (Sweden) Biomedical Center and in the Environmental Toxicology Division at Hopkins School of Hygiene. Dr. Fechter's research career has focused on two principal areas of neurotoxicology; susceptibility of the developing organism to toxicants and on the potentiation of neurotoxicology by multiple agents. These two foci have resulted in over 25 peer reviewed manuscripts related to carbon monoxide toxicity (out of approximately 80 total peer-reviewed papers) as well as to multiple review articles and chapters. He maintains an active research program in neurotoxicology where his focus has been predominantly in the areas of metabolic stress and complex environmental exposures that yield potentiation of toxicity. This work has entailed studies of carbon monoxide, hydrogen cyanide, and acrylonitrile neurotoxicity focused predominantly on auditory system function. This work has included benchmark dose calculations and consideration of risk assessment. He has also studied the neurotoxicity of complex hydrocarbon mixtures (aviation fuels) His research is currently funded by a VA Rehabilitation Service grant recently renewed until 2011. He also holds a Senior Research Scientist Career Award from the VA which is funded from 2007-2014. Additional research support has been provided by the American Petroleum Institute for research on fuel. Until he took a position at the VA, Dr. Fechter's research had been funded by NIH-NIEHS, NIH-NIDCD, NIOSH, the US EPA, and the Health Effects Institute among

others. Dr. Fechter has played an active consulting role in grant and manuscript review processes and in government policy review. He has served on review panels for NIEHS Superfund Research Center grants and has served as an ad hoc member or chair for multiple NIH and NIOSH P30, P40, P01, RO1, RO3, and R29 grants. He has served as a consultant on the Carbon Monoxide Criteria Document on two occasions (1979, 1984) and as a contributing author (1987- 1992) to that document. He has also been a consultant to the National Commission on Air Quality with regard to Carbon Monoxide at High Altitude, and to the US EPA SAC for a Developmental Toxicology Guideline. Dr. Fechter has also served as a consultant to the Ontario (Canada) Labour Relations Board on issues relating to occupational exposures, and the World Health Organization. He is an active member of the Society of Toxicology, the International Neurotoxicology Association (of which he has held multiple offices including that of President), and the Association for Research in Otolaryngology. He has served on the editorial boards of Toxicological Sciences, Neurotoxicology, and Neurotoxicology & Teratology and reviews widely for toxicology and hearing research journals. Dr. Fechter is currently serving as a scientific consultant on a review of the trichloroethylene literature for the US EPA.

Guensler,Randall

Georgia Institute of Technology

Randall Guensler is a Professor in the School of Civil and Environmental Engineering at the Georgia Institute of Technology. After working for the California Air Resources Board for seven years, and completing his Ph.D. in Civil Engineering at the University of California at Davis, Dr. Guensler joined Georgia Tech in 1994. During his years with the State of California, Dr. Guensler worked for four years in Compliance Assistance and for three years in the Executive Office, evaluating the design and implementation of transportation control measures by regional air quality management agencies. Since arriving at Georgia Tech, Dr. Guensler's main research focus has been the development of new monitoring and modeling tools to assess the air quality impacts of transportation policies. Dr. Guensler was the Chairman of the Transportation Research Board committee on Transportation and Air Quality from 1997 to 2002. From 1995 to 2001, Dr. Guensler served on the Environmental Protection Agency's Mobile Source Technical Advisory Subcommittee. Over the past ten years, he has served on various National Academy of Sciences committees and panels charged with the assessment of vehicle emissions impacts and identification of research needs. Dr. Guensler is the director of Commute Atlanta, a \$2.3 million joint value pricing initiative sponsored by the Federal Highway Administration and Georgia Department of Transportation. Commute Atlanta includes the collection and analysis of second-by-second vehicle speed, position, and engine operating data from 470 vehicles in representative Atlanta households. The researchers have monitored more than 1.4 million vehicle trips (more than 350,000 vehicle-miles per month). In 2005, the Commute Atlanta households began participating in road pricing experiments (cent/mile pricing, as well as real-time congestion pricing). Dr. Guensler's research team is assessing consumer response to these pricing mechanisms. A secondary focus of the research is the enhancement of monitoring technologies and services to support future transportation planning, safety, and operations policy initiatives. Development of tools for data management, data analysis, and privacy protection became major research activities. Secondary research has also included analysis of speeding, journey to work route choice, trip chaining, activity-based demand, household tripmaking variability, household and vehicle range of travel, long-distance travel, freeway operations, engine load, start and soak distributions, transit bus operations, etc.

Hazucha,Milan

University of North Carolina - Chapel Hill

Dr. Milan J. Hazucha is a Professor of Medicine in the Department of Medicine, School of Medicine and a Senior Research Scientist in the Center for Environmental Medicine, Asthma and Lung Biology, University of North Carolina at Chapel Hill. He received his M.D. in 1962 from the Comenius' University, Bratislava, Slovakia and his Ph.D. (Physiology, 1974) from McGill University, Montreal, Canada. As a Professor in The Graduate School and in the Curriculum in Toxicology, University of North Carolina he has been actively involved in teaching and directs a course on the health effects of air pollutants. He is a member of multiple professional organizations and over the years he has served on many professional committees. Dr. Hazucha has a longstanding experience and published expertise in the pulmonary and cardiovascular health effects of air pollutants (Ozone, CO, NOx) in healthy and at-risk population such as children, asthmatics and individuals with chronic lung disease. His specific expertise is in the area of physiologic assessment of effects and mechanisms of action. Over the past 30 years he has been either a Principal Investigator or a Co-Investigator in numerous collaborative laboratory and field exposure studies with the EPA HSD investigators. He has also participated in many EPA-organized workshops and contributed periodically in writing sections and reviewing NAAQS for ozone, CO and NOx. More recently his work has focused on studying the mechanisms involved in production and release of NO in patients with primary ciliary dyskinesia (PCD).

Kleinman,Michael T.

University of California, Irvine

Michael T. Kleinman is a Professor of Community and Environmental Medicine at the University of California, Irvine. He is an inhalation toxicologist and has been studying the health effects of exposures to environmental contaminants found in ambient air for more than 30 years. He holds a MS in Chemistry (Biochemistry) from the Polytechnic Institute of Brooklyn and a Ph.D. in Environmental Health Sciences from New York University. He is a Professor and Co-Director of the Air Pollution Health Effects Laboratory in the Department of Community and Environmental Medicine at University of California, Irvine. Prior to joining the faculty at U.C.I. in 1982, he directed the Aerosol Exposure and Analytical Laboratory at Rancho Los Amigos Hospital in Downey, CA. He has published more than 95 articles in peer-reviewed journals dealing with environmental contaminants and their effects on cardiopulmonary and immunological systems. He has directed more than 50 controlled exposure studies of human volunteers and laboratory animals to ozone and other photochemical oxidants, carbon monoxide, ambient particulate matter and laboratory-generated aerosols containing chemically or biologically reactive metals such as lead, cadmium, iron and manganese. He recently served on two National Academy committees to examine issues in protecting deployed US Forces from the effects of chemical and biological weapons. Dr. Kleinman's current studies focus on neurological and cardiopulmonary effects of inhaled particles, including nanomaterials and ultrafine, fine and coarse ambient particles in humans and laboratory animals. His current studies have demonstrated that inhalation of combustion-generated particles can promote airway allergies and accelerate the development of cardiovascular disease and that these effects may be associated with organic and elemental carbon components of the ultrafine fraction of the ambient aerosol. His studies have also demonstrated that inhalation of ambient particles is associated with persistent inflammation in the brain and that particles associated with manganese can alter dopamine and serotonin levels in the brain and can cause changes in nerve structure during

brain development. California EPA, HUD, NIH, and the US EPA are the current sources of funding for his work. Dr. Kleinman has previously served on the U.S. EPA Science Advisory Board' Clean Air Scientific Advisory Committee (CASAC) Ozone panel and currently serves as the Chair of the California Air Quality Advisory Committee.

Penn,Arthur

Louisiana State University

Dr. Arthur Penn is Professor in the Department of Comparative Biomedical Sciences and Director of the Inhalation Research Facility at the Louisiana State University School of Veterinary Medicine in Baton Rouge, LA. He came to LSU in 1998 after spending twenty years on the faculty of the Department of Environmental Medicine at NYU Medical Center in New York. He received an A.B. from Columbia, a Ph.D. in Molecular Biology from the University of Pennsylvania and did post-doctoral work in Lipoprotein Biochemistry at Lawrence Livermore National Laboratory in Livermore, CA, before taking up his position at NYU. His major research interest is in the effects of inhaled airborne combustion products (vapor phase and particulate) on acceleration of atherosclerosis and asthma. His laboratory was one of the first to report that inhalation of environmentally-relevant levels of environmental tobacco smoke (ETS) results in accelerated atherosclerosis. A major recent focus on the effects of gestational exposure to ETS on adult-onset diseases has revealed (in collaboration with colleagues at the University of Alabama at Birmingham) that in utero ETS exposure of mice results in accelerated adult atherosclerosis that is associated with mitochondrial damage, even in the absence of a high fat diet. Additionally, in utero ETS exposure induces inflammatory responses and functional changes, accompanied by a characteristic set of gene expression alterations, in a mouse asthma model.

Penney,David

Independent Consultant

David G. Penney, Ph.D., is a retired professor of physiology, who taught and conducted research on carbon monoxide at the School of Medicine, at Wayne State University, Detroit, Michigan. He was at one time, adjunct professor of occupational and environmental health in the School of Allied Health Professions at Wayne State University. He is also retired as director of general surgical research at Providence Hospital in Southfield, Michigan, where for 12 years he directed the scholarly activities of surgical residents and attending surgeons. Dr. Penney obtained his B.Sc. degree from Wayne State University in 1963, and his M.Sc. and Ph.D. degrees from the University of California, Los Angeles in 1966 and 1969, respectively. Before coming to Wayne State University in 1977, he was a faculty member at the University of Illinois, Chicago. Dr. Penney's published works on carbon monoxide includes over 65 peer-reviewed research articles, several dozen other articles and abstracts, a number of review articles, book chapters, and three other books in print. Currently, Dr. Penney assists Underwriters Laboratory (UL) as a medical expert on CO in establishing standards for CO alarms and other gas monitoring equipment, and major heating gas distributing companies in educating the public about the dangers of CO poisoning.

Pielke, Sr.,Roger

University of Colorado - Boulder

Dr. Roger A. Pielke Sr. is currently a Senior Research Scientist in CIRES and a Senior Research Associate at the University of Colorado-Boulder in the Program in Atmospheric and Oceanic Sciences (PAOS) at the University of Colorado in Boulder (Nov. 2005 -present). He is also an Emeritus Professor of Atmospheric Science at Colorado State University and has a five-year appointment (April 2007 - March 2012) on the Graduate Faculty of Purdue University in West Lafayette, Indiana. He received a B.A. in Mathematics from Towson State College in 1968 and an M.S. and Ph.D. in Meteorology from Pennsylvania State University in 1969 and 1973, respectively. Pielke has studied terrain-induced mesoscale systems, including the development of a three-dimensional mesoscale model of the sea breeze, for which he received the NOAA Distinguished Authorship Award for 1974. Dr. Pielke has worked for NOAA's Experimental Meteorology Lab (1971-1974), The University of Virginia (1974-1981), and Colorado State University (1981-2006). He served as Colorado State Climatologist from 1999-2006. He was an adjunct faculty member in the Department of Civil and Environmental Engineering at Duke University in Durham, North Carolina (July 2003-2006) and a visiting Professor in the Department of Atmospheric Sciences at the University of Arizona from October to December 2004. He has served as Chairman and Member of the AMS Committee on Weather Forecasting and Analysis, and was Chief Editor for the Monthly Weather Review for 5 years from 1981 to 1985. In 1977, he received the AMS Leroy Meisinger Award for "fundamental contributions to mesoscale meteorology through numerical modeling of the sea breeze and interaction among the mountains, oceans, boundary layer, and the free atmosphere." Dr. Pielke received the 1984 Abell New Faculty Research and Graduate Program Award, and also received the 1987/1988 Abell Research Faculty Award. He was declared "Researcher of the Year" by the Colorado State University Research Foundation in 1993. In 2000 he received the Engineering Dean's Council Award from Colorado State University. He has authored a book published by Academic Press entitled Mesoscale Meteorological Modeling (1984) with a 2nd edition in 2002, a book for Routledge Press entitled The Hurricane (1990), a book (co-authored with W.R. Cotton) for Cambridge Press entitled Human Impacts on Weather and Climate (1995; 2nd Edition 2006), a book (co-authored with R.A. Pielke, Jr.) entitled Hurricanes: Their Nature and Impacts on Society published in 1997 by John Wiley and Sons, and was Co-Chief Editor (with R.A. Pielke, Jr.) of a book entitled Storms, published by Routledge Press in 1999. Dr. Pielke was elected a Fellow of the AMS in 1982 and a Fellow of the American Geophysical Union in 2004. From 1993-1996, he served as Editor-in-Chief of the US National Science Report to the IUGG (1991-1994) for the American Geophysical Union. From January 1996 to December 2000, he served as Co-Chief Editor of the Journal of Atmospheric Science. In 1998, he received NOAA's ERL Outstanding Scientific Paper (with Conrad Ziegler and Tsengdar Lee) for a modeling study of the convective dryline. He was designated a Pennsylvania State Centennial Fellow in 1996, and named the Pennsylvania State College of Earth and Mineral Sciences Alumni of the year for 1999 (with Bill Cotton). He is among one of three faculty and one of four members listed by ISI HighlyCited in Geosciences at Colorado State University and the University of Colorado at Boulder, respectively. Professor Pielke has published over 300 papers in peer-reviewed journals, 50 chapters in books, and co-edited 9 books. A listing of papers can be viewed at the project website: <http://cires.colorado.edu/science/groups/pielke/pubs/>.

Ritz, Beate

UCLA

Beate Ritz, MD, Ph.D., is Professor and Vice Chair the Department of Epidemiology with co-appointments in the department of Environmental Health at the UCLA School of Public Health and the department of Neurology UCLA School of Medicine; she is a member of the Center for Occupational and Environmental Health, the NIEHS-UCLA-USC Environmental Health Science Center, and co-director of the NIEHS-funded UCLA Center for Gene-Environment Studies of Parkinson's disease. Her primary research interests are the effects of occupational and environmental toxins such as pesticides, ionizing radiation, and air pollution on chronic diseases including neurodegenerative disorders (Parkinson's disease), cancers, and adverse birth outcomes including birth defects and asthma. She currently studies the effects of air pollution on adverse birth outcomes and asthma in children in Southern California and investigates the long-term effects of pesticide exposures on Parkinson's disease and cancers. Her research involves extensive geographic information system (GIS) modeling of environmental exposures including pesticide use and traffic related air pollution in California and the application of hierarchical modeling procedure of longitudinal data in cohort studies. She is directing or collaborating in a large number of federally (NIEHS), state (California Air Resources Board), and foundation (Micheal J Fox Foundation) funded research projects.

Roberts, Paul

Sonoma Technology, Inc.

Dr. Paul T. Roberts is Executive Vice President and Chief Scientific Officer of Sonoma Technology, Inc. At STI since 1986, Dr. Roberts' work focuses on the design and management of air quality field, data management, and data analysis projects. Dr. Roberts earned his Ph.D. degree in Environmental Engineering Science at the California Institute of Technology in 1975 working for Professor Sheldon K. Friedlander on formation of secondary aerosols in the Los Angeles basin. His B.S. and M.Ch.E degrees in Chemical Engineering are from Rice University (1969 and 1970). Dr. Roberts served on the EPA External Peer-Review Panel for the Air Quality Criteria Document for Carbon Monoxide in 1998-1999. He has also served on numerous STAR-grant and similar peer-review panels for EPA and HEI. Dr. Roberts was a member of the California Inspection and Maintenance Review Committee in 1994-1995. Most of Dr. Roberts' projects involve the use of field data and analysis methods to understand important meteorological, air quality, and exposure phenomena; to support the development, application, and evaluation of meteorological, photochemical, and exposure models; and to evaluate the effectiveness of ambient air quality and meteorological networks in meeting various regulatory requirements. Dr. Roberts has expertise in the atmospheric science, exposure assessment, and measurement of ozone and particulate matter (PM) and their precursors, and of carbon monoxide (CO), toxics, and visibility. He has led and performed air quality projects throughout the western, central, mid-western, mid-Atlantic, and northeastern United States; and in Juarez, Mexico, and Cairo, Egypt. Recently, his work has focused on near-roadway and other near-source exposures to PM and toxics, as well as CO and nitrogen dioxide (NO₂). Dr. Roberts is a member of the Air and Waste Management Association and the American Associate for Aerosol Research.

Thom, Stephen

University of Pennsylvania

Stephen R. Thom, MD, Ph.D., is Chief of Hyperbaric Medicine for the University of Pennsylvania's Institute for Environmental Medicine and Medical Director of the Pennstar Flight Program. He is also Professor of Emergency Medicine and Emergency Medicine in Pediatrics at the University of Pennsylvania and Children's Hospital of Philadelphia, respectively. With published papers involving studies with cell cultures, animal models and clinical trials; his lab has had an interest in carbon monoxide (CO) pathophysiology for some years. Our work has shown that there are biochemical/physiological responses to CO that depend on both the concentration and duration of exposure. In cell cultures, biochemical evidence of oxidative stress responses occur with exposures to just 20 ppm CO. Intravascular effects in humans were demonstrated following exposures lasting less than 1 hour and COHb levels on the order of 19%. We have shown that neuropathology results from a relatively complex cascade of intravascular and perivascular events.