

BIOGRAPHICAL SKETCH

Arnold W. Siegel, P.E., FSAE
4461 Hayvenhurst Avenue
Encino, California 91436

Tel: (818) 783-1888
Cell: (818) 388-9350
E-mail: arainc@aol.com
Website: ara-inc.net

Mr. Siegel was born in Toledo, Ohio. He received a Bachelor's Degree in Physics in 1956 from UCLA and a Master's Degree, with emphasis on Operations Analysis, in 1958. He continued post-graduate work in Biomechanics at UCLA.

Mr. Siegel's commitment to automotive collision injury research dates from his position in 1955 as an Associate Project Engineer with UCLA's Institute of Transportation and Traffic Engineering. This pioneer group initiated the world's first experimental full scale automotive crash program collecting and publishing scientific data on hundreds of crashes: barrier crashes to 40 mph, side impact crashes at 10 to 40 mph, head on crashes 20 to 100 mph, rear-end crashes to 55 mph, rollover crashes, truck, bus, pedestrian, and motorcycle crashes.(See Selected Bibliography)

He helped to design and to construct early versions of anthropometric dummies. He conceived, designed and built the first infant and child dummies. A variety of infant and child safety systems was subsequently crash tested. This research data formed the early criteria for development of the first stage of true infant and child safety seats.

From 1960 to 1976 he administered and co-directed the Trauma Research Group of UCLA's School of Engineering & School of Medicine, Department of Surgery. He had a joint appointment as a Research Professor with UCLA's School of Medicine and School of Engineering. Later, he was a consultant to the group at UCSD. With a physician as co-director, he developed and managed the first non-fatal multidisciplinary on-scene accident investigation data collection teams and in 1966, developed and organized the original accident training programs for the first U.S. Department of Transportation Investigation Teams. Also in 1966 his team completed the first National Transportation Safety Board (NTSB) investigation.

Since 1956 Mr. Siegel has been a consultant in automotive accident and injury analysis, aircraft injury analysis, traffic safety and biomechanics of injury for domestic and foreign industry, for Ministries of Transportation in Europe and the Orient, for the U.S. Departments of Health, Education and Welfare, Transportation, Defense and for the General Services Administration, U.S. Forest Service, for police departments in California and other states, and for attorneys and insurance companies world wide. He has over forty years of collision and injury experience and analysis, both for research and for forensic matters.

Mr. Siegel has conducted many seminars, short courses and symposia on automotive collision dynamics, collision investigation, biomechanics, mechanisms of human injury, skid mark analysis and industrial design at UCLA and other universities and organizations. He has presented over 1,000 lectures and talks and has authored and co-authored over fifty peer reviewed research papers, over 100 articles on collision phenomena, and fifteen motion picture films.

In 1964, and again in 1971, he was the recipient of the Metropolitan Life National Safety Council Award. In 1972 he was awarded the Belgian International Traffic Safety Award for Collision and Injury Research. He has been on the Board of Directors of the Association for the Advancement of Automotive Medicine, Action for Child Transportation Safety, Safety Belt Safe, SAE International and the SAE Foundation. He was a pioneer member of the Committee for the Stapp Biomechanics Conference and was Permanent Co-Chair for five years while organizing the Stapp Foundation. (See Page 5)

He is a Fellow of the Society of Automotive Engineers, and a member of the California Association of Criminalists, Sigma Xi, and is a Professional Safety Engineer. He was a member of the Attorney General's Traffic Safety Committee and the California Passenger Safety Resource Panel. He has been a consultant to many Agencies and Companies, including Physicians for Automotive Safety, and the Society of Automotive Engineers Accident Investigation Practices Subcommittee as well as other SAE Committees, including the SAE Toptec Board. In 1957, and again in 1968, he gave testimony before the U.S. Congressional Subcommittees on Automotive Safety. (Research papers 1 & 18).

The Arnold W. Siegel Award has been given annually since 1985, first to the authors of the leading research papers at the Stapp Biomechanics Conference. In 2001 the Siegel Award criteria was expanded to include major transportation safety contributions globally. It includes an Honorarium from the Siegel Endowment Fund of the SAE Foundation and a Medal for the recipient's accomplishments. It is given annually at the Society of Automotive Engineers Congress, Honors Convocation.

EDUCATION:

B.A., UCLA, 1956, Physics. M.B.A., UCLA 1958; Operations Analysis (Systems Engineering). Post-Graduate, UCLA. Approximately seven years of post-graduate training and study in Biomechanics.

TRAINING-EXPERIENCE:

Phase 1 (1954 -1962)

Member of the Pioneer first full-scale, scientific automotive experimental crash program; Institute of Transportation and Traffic Engineering, UCLA. Conducted barrier, head-on, rear-end, rollover, pedestrian, motorcycle, bicycle, truck, bus and van crashes.

Phase 2 (1960 -1980)

Initiated the first medical-engineering multi-disciplinary field analysis program for non-fatal crash studies. Joint Appointment as Professor UCLA, School of Engineering and School of Medicine.

Phase 3 (1980 - present)

Studies in mechanism of injury, biomechanics. Safety engineering and forensic analysis related to automotive and aircraft accidents.

TEACHING EXPERIENCE:

Seminars and courses regarding collision and injury analysis for multi-disciplinary investigation programs World-wide, including training of the first investigation teams for the U. S. Department of Transportation.

CONSULTING:

Consultation with Police, Sheriffs, Attorneys General, attorneys, U.S. Cabinet Departments such as Department of Interior, Agriculture, Transportation, Defense, Health, Education and Welfare. Agencies such as National Transportation Research Board, National Highway Traffic Safety Agency, U.S. Forest Service, U.S. Public Health Service; also direct consultation with Ministries of Transportation for other countries.

Additionally, he has consulted with almost all of the automotive, truck and private aircraft manufacturers in the world on matters related to collision and injury analysis.

ORGANIZATIONS:

Stapp Conference Planning Board, Society of Automotive Engineering, Fellow SAE, Safety Advisory Board, Toptec Association for the Advancement of Automotive Medicine (Board of Directors), Co-founder of the Western Chapter of AAAM, American Academy of Forensic Sciences, California Association of Criminalists, Sigma Xi, American Institute of Forensic Sciences, Safety Belt Safe.

PUBLICATIONS - published:

Over fifty scientific research papers in engineering and medical journals. Approximately six syllabi and training manuals for collision and injury research and fifteen motion picture films used for training and safety education. Over 100 articles for magazines and trade journals.

AWARDS:

Recipient of National Safety Council; Metropolitan Life Award, 1962, for collision research and in 1971, for field analysis and research in accidents. In 1972, recipient of the International Traffic Safety Award for Research in Accidents, Belgium.

The Arnold W. Siegel International Transportation Safety Award is given annually for transportation safety accomplishments.

FORENSIC QUALIFICATIONS:

Testimony in Municipal, State and Federal courts throughout the United States and elsewhere. Founded Accident Reconstruction Associates in 1957.

Contributions to the Automotive Industry and to Society at Large

The following changes in the mobility industry have occurred as an indirect or direct result of the pioneer UCLA Crash Experimental research and pioneer UCLA multidisciplinary on-scene accident research programs. Arnold Siegel had a leadership role both in creating as well as developing experimental and research data to effectuate vehicle crash worthiness changes.

Purpose of the crash program was:

- 1) Determining what occurred during single and multi-vehicle collisions, the dynamics and kinematics of vehicles and anthropometric dummies;
- 2) Identifying where and how injuries were occurring and the forces involved; and
- 3) Setting up injury reducing, energy absorbing, load distributing alternatives.

The publications for the experimental collision and restraint research are listed in the attached Selected Bibliography (Papers 1-9, 11).

This work, the first of its kind, produced dynamics and kinematics data of frame and body and early uni-body vehicles. It also produced data on anthropometric dummy dynamics, kinematics and projected injury patterns. The program formed the basis for data collection techniques using accelerometers, vehicle crash system layout and design, hi-speed camera techniques, vehicle target design, and vehicle impact coordination procedures. Adult, child and infant dummies were designed and built. Various restraint systems were designed, built and tested. Military 3-point harnesses were also adapted and tested.

The listed publications led to energy absorbing, crash force reducing data for vehicle and aircraft design, as well as advances in restraint design for adults and children, instrument panel redesign, crash cushion design, windshield and glazing design, steering wheel and column redesign, roof structure design, and seat design, (note: the first head-restraint for rear end collisions was developed and tested based on Mr. Siegel's undergraduate research). He also consulted with GM's Fisher Body Division, Carl Hadeen, Director to create a basis for the original side-door crash reduction structure.

The balance of his research (Papers 10-51, and Special Reports & Syllabi) related to on-scene accidents with automobiles, trucks and buses. In the early 1960's he moved into the live accident research field while administrating the crash program to further develop human tolerance data. He cooperated with and consulted with manufacturers and NHTSA to further develop energy absorbing, load distributing, exterior and interior components, HPR windshields, energy absorbing steering columns, side door beams, instrument panels, etc. The data and conclusions were given directly to automotive manufacturers and to NHTSA.

Mr. Siegel worked very closely with the Government Services Agency (GSA) and then with the Department of Transportation, originally the National Highway Safety Bureau (NHSB) later elevated to the National Highway Transportation Safety Agency (NHTSA) to develop the original GSA and FMVSS automotive standards.

In summary all of Mr. Siegel's engineering efforts were directed towards crash injury research, developing human tolerance data and applying the data to increase vehicle and aircraft crashworthiness and to decrease the injury severity.

ARNOLD W. SIEGEL CONTRIBUTIONS TO
NON-PROFIT, SCIENTIFIC, EDUCATION, COMMUNITY
and
PHILANTHROPIC FOUNDATIONS

Director/Trustee/Member-Current/Recent

Director (2004-2007) International Society of Automotive Engineers, Inc.
Fellow, Society of Automotive Engineers, Inc. (SAE)
Director, SAE Foundation
Society of Automotive Engineers Topotec
Founder, West Yellowstone Foundation
Founder, Yellowstone Historic Center (Museum)
Chair, Madison-Gallatin Wild Trout Foundation

Awards

Abelson Leadership Award 2008
Montana Ambassador's Plenipotentiary 2001 Award
Humanitarian Fellowship Award-Save the Children Federation
Distinguished Service Award - Service Technician Society
Legacy of Gold - West Yellowstone Foundation
Metropolitan Life National Safety Council Award 1964, 1971
Belgian International Traffic Safety Award 1972

*The Arnold W. Siegel Award has been given annually since 1985 for Transportation Safety Research and accomplishments. It includes an Honorarium from the Society of Automotive Engineers Siegel Endowment Fund, and a Gold Medal.

Scholarships

Six Siegel/STS (Siegel/Society of Service Technicians) scholarships have been established at Montana Colleges of Technology - an endowed fund by A.W. Siegel which is serving as a National Pilot Program.
West Yellowstone Foundation, Siegel Scholarships for all graduates

Director/Trustee/Member - Past

Montana Community Foundation
Action for Child Transportation Safety
American Academy of Pediatrics - Committee for Child Transportation
Association for Advancement for Automotive Medicine
Physicians for Automotive Safety
Stapp Biomechanical Conference, Chair
Stapp Foundation - Chair (retired)
West Yellowstone Stewardship Center
Yellowstone Park Association (Yellowstone National Park)

Other Contributions

Save the Children Foundation, United Way, Red Cross, St. Vincent DePaul Charities
Volunteer - numerous Local and National Committees, Sub-Committees for Education, Welfare and Safety

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3. Severy, D.M., Mathewson, J.H., Siegel, AW.: "Automobile Head-On Collisions, Series II," SAE Transactions, 67:238-264, 1959.
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5. Severy, D.M., Mathewson, J.H., Siegel, AW.: "Automobile Head-On Collisions, Series III," Journal of Society of Automotive Engineers (Aug. 1960).
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9. Severy, D.M., Mathewson, J.H., Siegel, AW.: "Automobile Side-impact Collisions, Series I I," Society of Automotive Engineers Report No. 49 1 A, 1962, Traffic Safety, pp 99-107 (Dec. 1964).
10. Nahum, A.M., Siegel, AW., Miller, S.E.: "Injury in Non-Fatal Accidents-- Windshield Injuries," Eighth Stapp Car Crash Conference, pp. 12-31, 1964.
11. Nahum, A.M., Severy, D.M., Siegel, AW.: "Automobile Accidents Correlated with Collision Experiments: Head-On Collisions," Ninth Stapp Car Crash Conference, pp. 303-3 16, 1965.
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13. Nahum, A.M., Siegel, AW., Hight, P.V.: "Injuries to Rear Seat Occupants in Automobile Collisions," Eleventh Stapp Car Crash Conference, pp 159-174, 1967.
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16. Lasky, U., Siegel, AW., Nahum, A.M.: "Automotive Cardiac-Thoracic Injuries: A Medical-Engineering Analysis," SAE Congress, Paper No. 680052 (Jan. 1968).
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SPECIAL REPORTS AND SYLLABI

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UCLA Medical Engineering Training Seminar II: The syllabus discusses collision and injury investigation, analysis and reconstruction and related subjects. This program was the second co-sponsored UCLA- Department of Transportation seminar. Director of Training, A. W. Siegel, June, 1969.

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