

## **CURRICULUM VITAE**

### **Kirk J. Staggs**

#### **84-Retired Lawrence Livermore National Laboratory, Livermore, CA**

From 1981-1984 I worked as a contractor at Lawrence Livermore National Laboratory (LLNL) employed by Butler Service Group out of Sunnyvale, Ca. Between 1984 and 2007 I work as a Department of Energy (DOE) contractor employed by the University of California and from 2007 until I retired I worked as a DOE contractor for Lawrence Livermore National Laboratories (LLNS).

Between 1981 and 2004 I conducted fire testing and safety analysis for various DOE programs I conducted small and large-scale fire experiments to evaluate and determine the performance of materials, fire models, energized and un-energized electrical wires and cables, building and ventilation systems, and fire management systems (fire detectors, sprinkler systems, etc.). I also performed training of fire fighters and testing personal protection equipment. I have written Operations Procedures, Operational Safety Procedures, Facility Safety Procedures, National Environmental Protection Act documents, project proposals, test plans, and reports.

From 1997 to 2006 I supported the Yucca Mountain Program, continued to conduct fire testing, and conducted fire hazard analysis for nuclear weapon systems and DOE waste facilities. My duties associated with the Yucca Mountain Program involved the design, fabrication, and setup of materials testing and analysis related to the corrosion of various metal alloys. I provided similar support to the National Ignition Facility (NIF) laser program.

Between 2006 and 2010 I worked for the NIF project as an inspector for electrical assemblies, wire harness, electrical cables, and clean room certifications. I changed the NIF electrical standards for wire and cables from unique DOE specifications to industrial standards and specified electrical testing standards for cable and harness assemblies. I also perform inspection of large optics used in the NIF beam lines.

#### **77-80 Ed Chovanes Ford, San Leandro, Ca.**

I worked in the new car department as a utility/installer technician receiving and preparing new cars for delivery.

My duties included the fueling and de-fueling, troubleshooting, inspection, adjustment, power turn-up, and scheduled and unscheduled maintenance of jet aircraft. I was a supervisor, training petty officer, safety petty officer, and ground turn-up NATOPS instructor.

## **EDUCATION**

- Certificate in Fire Protection Engineering from UC Davis, 1998
- Chabot College, Hayward, CA; AA degrees in Electronic and Computer Technology, 1983
- U.S. Navy, Millington, Tenn.; Aviation Machinist Mate Jet (A) School, 1974
- Livermore High School, Livermore, CA; Graduated in 1973

## **CONSULTING WORK EXPERIENCE**

### **81-Present Consultant, Livermore, Ca.**

My consulting services involve all aspects of testing (designing, coordinating, fabricating, and operations) related to fire, explosions, and equipment performance and failure. I provide analysis of test and accident data in determining probable cause and origin of fire or explosion. In addition, I provide analysis in fire spread, damage patterns, material failure, equipment failure, and fire management systems. I also provide computer generate graphics of data (graphs, tables, etc.) and drawings for analysis, deposition, and court room presentations, and reports.

I setup, calibrate, and operate computer based data acquisition systems, flux meters, temperature sensors, load cells, flow meters, torque meters, RPM meters, optical meters, video equipment, electrical equipment, and other types of analog and digital sensors and equipment.

I have conducted inspections to determine the cause and origin of fires involving single and multiunit dwellings, commercial and industrial building and/or complexes, gas and electrically powered vehicles, and a private substation. I have also conducted fire inspections of domestic, commercial, and industrial electrical and/or electrical mechanical equipment and components.

I have studied and tested fire related events involving aircraft, automobiles, electrical equipment, batteries, wiring, buildings, building material, and propellants. I have worked on accidents involving fire, smoke, explosions, electrical arcing, electrical over-load, static discharge, welding, piloted ignitions, smoking materials, oxidizers, corrosion, and other nonspecific fire causes.

I have conducted compliance reviews to determine if electrical equipment, buildings, and systems are in compliance with various codes and standards. I have given depositions and testimony related to the examination of evidence, experimental and testing, cause and origin of the fire, damage patterns, and equipment failure.

81-Present **Depositions and Testimony related to Consulting**

Rossmore v Club Car; Deposition, Walnut Creek Ca. 1986

Johnson v Sierra Spring; Deposition, Sacramento, Ca. 1994

Alan Bell v. Cacao; Deposition and Expert Testimony, San Jose, Ca. 1997

Safeco/George v. Hydro-Quip; Deposition, Sacramento, Ca. 2000

Lockheed Martin v. RFI Supply; Deposition, San Francisco, Ca 2002

Travelers Property Casualty Insurance v. EZGO; Deposition, Santa Barbara, Ca 2007

**Publications, Reports, and Presentations**

Norman Alvares, Harry Hasegawa, and Kirk Staggs, “Ignition, Heat Release Rate and Suppression of Elastomeric Materials”, present at 6<sup>th</sup> International Symposium on Tunnel Safety & Security (ISTSS) 12-14 March, 2014 and published in the ISTSS 2014 Special Issue in Fire Technology.

N Alvares, K Staggs, G Rein, “Investigation of a Fatal Fire in a Moving Vehicle”, 5th International Seminar on Fire and Explosion Hazards, Edinburgh, Apr. 2007, pp. 800-809.

S. Felker, P. Hailey, K. Staggs, T. Lian, and G.E. Gdowski “Alloy 22 Localized Corrosion Susceptibility in Aqueous Solutions of Chloride and Nitrate Salts of Sodium and Potassium at 110-150°C”, UCRL-TR-218195, September 2006.

J.A. Rard, K.J. Staggs, S.D. Day, and S.A. Carroll, “Boiling Temperature and Reversed Deliquescence Relative Humidity Measurements for Mineral Assemblages in the NaCl + NaNO<sub>3</sub> + KNO<sub>3</sub> + Ca(NO<sub>3</sub>)<sub>2</sub> + H<sub>2</sub>O System”, accepted for publication in the Journal of Solution Chemistry, August 2006.

Kirk J Staggs, Norman J Alvares, Daniel W. Greenwood, “The Difference between Measured and Stored Minimum Ignition Energies of Dimethyl Sulfoxide Spray at Elevated Temperatures”; presented at the American Society for Testing and Materials (ASTM) Symposium on Thermal Measurements: The Foundation of Fire Standards, (December 3, 2001) and published in the ASTM STP 1427, “Thermal Measurements: The Foundation of Fire Standards”; 2002

Kirk Staggs, Norman Alvares, Mark Newton, “Fire Risk Analysis for the NIF Capacitor Containment Design”, Lawrence Livermore National Laboratory, ICRL-ID-133180, (February 22. 1999)

K.J. Staggs, K.R. Wilson, D.P. Eadens, J.W. Stengel, Y.P. Chong, "Evaluation of Anti-Contamination Garments in Use at LLNL", Lawrence Livermore National Laboratory, UCRL-ID-128830, (December 1997)

W. Bergman, K. Wilson, K. Staggs, D. Wapman, "Development of an Air Cleaning System for Dissolving High Explosives from Nuclear Warheads", Lawrence Livermore National Laboratory, UCRL-JC-127216, (February 1997)

Howard Lambert, Kirk Staggs, Annette Macintyre, "Fire Risk Analysis of W79 HE Dissolution Workstation in Facility 12-98 Cell 2", Lawrence Livermore National Laboratory, Livermore, Ca (1997)

W. Bergman, K.J. Staggs, D.E. Turner, D.W. Greenwood, P.D. Wapman "Spark Ignition Studies of DMSO/HE Sprays, Liquids and Aerosols in the W79 HE Dissolution Workstation, (November, 1996)

K. J. Staggs "Waste Storage Areas and Inventory Fire Tests", presented at Annual DOE FPE Contractors Conference, Gatlinburg TN, (April, 1995)

K. J. Staggs "55 Gallon Metal Waste Drum Testing", presented DOE Third Annual Occupational Safety and Health Conference, San Diego, CA, (October, 1994)

K. J. Staggs "55 Gallon Metal Waste Drum Testing", presented at Annual DOE FPE Contractors Conference, Albuquerque, NM, (April, 1994)

K. J. Staggs, H. K. Hasegawa, and S.M. Doughty, "Development of Flammable Liquid Storage Wooden Cabinets for Chemical Laboratories", Lawrence Livermore National Laboratory, Livermore, Ca, UCRL-ID-115605, (1993)

H. K. Hasegawa, K. J. Staggs, and S.M. Doughty, "Fire Testing of 55 Gallon Metal Drums for Dry Waste Storage", Lawrence Livermore National Laboratory, Livermore, Ca, UCRL-CR-115037, (1993)

H. K. Hasegawa and K. J. Staggs, "Large-Scale Tests to Evaluate the Effectiveness of Various Fire Suppression Agents on Burning Stacked Tires", (currently under review for publication), Lawrence Livermore National Laboratory, Livermore, Ca (1993)

H. K. Hasegawa, K. J. Staggs, and S.M. Doughty, "Fire Tests to Evaluate the Potential Fire Threat and its Effects on HEPA Filter Integrity in Cell Ventilation at the Oak Ridge National Laboratory Building 7920", UCRL-CR-114339, Lawrence Livermore National Laboratory, Livermore, Ca (December 1992)

H. K. Hasegawa, K. J. Staggs, and S.M. Doughty, "Fire Tests of Wire and Cable for DOE Nuclear Facilities", UCRL-ID-110598, Lawrence Livermore National Laboratory, Livermore, Ca (September 1992)

A. C. Fernandez-Pello, H. K. Hasegawa, K. J. Staggs, A. E. Lipska-Quinn and N. J. Alavres, "A Study of the Fire Performance of Electrical Cables", Fire Safety Science-Proceedings Of The Third International Symposium, pp. 237-247

Kirk J Staggs, "Fume Hood Exhaust Duct Fire Tests: Building 222", UCID-21675, Lawrence Livermore National Laboratory, Livermore, Ca (May 1989)

Donald Beason, Ken Foote, Steve Priante, and Kirk Staggs, "Fire Exposure to an Office Trailer Complex", Lawrence Livermore National Laboratory, Livermore, Ca. (1988)

Harry Hasegawa, Kirk Staggs, Norman Alvares, and A. C. Fernandez-Pello, "A Procedure for Ranking Performance of Electrical Cables", Hazards Control Department Annual Technology Review 1987, Lawrence Livermore National Laboratory, Livermore, Ca.

Harry Hasegawa, Kirk Staggs, and Steve Leeds, "Evaluation of Quick-Acting ON/OFF Sprinkler Head Performance", Hazards Control Department Annual Technology Review 1986, Lawrence Livermore National Laboratory, Livermore, Ca.

Kirk Staggs, "Sensitivity of Fire and Smoke Detectors to Environmental Conditions: RF and Microwave Exposure", Hazards Control Department Annual Technology Review 1985, Lawrence Livermore National Laboratory, Livermore, Ca.

Norman Alvares and Kirk J Staggs, "Shock Hazards Resulting from the Inadvertent Release of Water from Fire-Protection Sprinkler System", Hazards Control Department Annual Technology Review 1985, Lawrence Livermore National Laboratory, Livermore, Ca.

H.K. Hasegawa, N.J. Alvares, A.E. Lipska-Quinn, D.G. Beason, K.L. Foote, S.J. Priante, and K.J. Staggs, "Fire Protection Research for DOE Facilities: FY 84 Year-End Report", Lawrence Livermore National Laboratory, Livermore, Ca. (1985)

H.K. Hasegawa, N.J. Alvares, A.E. Lipska-Quinn, D.G. Beason, K.L. Foote, S.J. Priante, and K.J. Staggs, "Fire Protection Research for DOE Facilities: FY 83 Year-End Report", Lawrence Livermore National Laboratory, Livermore, Ca. (1984)

Kirk J Staggs, "Apparatus for Large-Scale Cable Fire Experiments", UCID-19433, Lawrence Livermore National Laboratory, Livermore, Ca. (1982)