

Robson Forensic

Engineers, Architects, Scientists & Fire Investigators

RAYMOND K. SCHNEIDER, P.E. Mechanical Engineer

PROFESSIONAL EXPERIENCE

2009 to present **Robson Forensic, Inc.**
Associate

Provide technical investigations, analysis, reports, and testimony for failure analysis, and towards the resolution of commercial and personal injury litigation involving all aspects of HVAC systems for buildings: system design, product design, analysis, construction, testing, teaching and evaluation. Areas of expertise include:

HVAC: Load calculations and system design; installation and maintenance manuals; fans, air handlers; DX and water cooled refrigeration; heat pumps; cooling towers; closed circuit coolers; pumps; humidification and humidifiers; noise control; filtration; contamination control; gas phase filtration; piping design and installation; indoor air quality; mold and mildew; outdoor air; energy management; refrigerants; safety; controls; DDC; low relative humidity environments; carbon filtration; duct construction and installation; UV applications; heating systems employing electric heat, No. 2 oil, natural gas, or propane gas.

HVAC Service: Commercial refrigeration, heating, and air-conditioning installation and service; all aspects of refrigeration and air-conditioning design; sales and service including electrical installation and troubleshooting.

Product Development: Commercial air-conditioning packaged units, water-cooled and air-cooled air conditioners, baseboard radiation, gas and oil fired boilers, military environmental control units, HEPA filtration fan units, laboratory clean benches, personal filter-fan units, operation manuals, wiring diagrams, sequence of operation, third party certification testing.

Industrial Systems: Ventilation, process exhaust; process drains; water-for-injection (WFI); DI water; sterile facility design and construction, contamination control; clean room design and construction; modular wall systems; floor and ceiling systems; medical gases; clean, dry air; nitrogen; liquid nitrogen; hazardous gas handling and piping systems; laboratory benches; hazardous exhaust; industrial exhaust treatment; hazardous waste water treatment; gas cabinets; explosion-proof systems; lighting systems; homecare pharmacy.

Testing: Electrical performance, thermal performance, air and water flow and pressure measurement, humidifier performance, quality acceptance, building HVAC system testing and balancing, Underwriters Laboratory approval, clean room certification.

Types of Facilities: Computer chip, fiber optics, bio-pharmaceutical, medical device, precision assembly, laminating, food processing, printed circuit board, hospitals, bio-labs, educational, residential, restaurants, cold storage, offices, silicon wafer, retail, supermarkets, electronic assembly, computer assembly, pleasure boats, hotel/motel.

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- 2000 to present **Clemson University**
Associated Professor, Construction Science and Management
Interim Chair, Construction Science and Management
Teaches courses in construction materials and methods used in residential and commercial construction, as well as a two-semester sequence on building mechanical systems. Participates in curriculum development as well as department administrative assignments, student advising, faculty assignments, and evaluation.
- 1996 to 2000 **Luwa Bahnson**
Vice President and Manager, Luwa Bahnson Cleanrooms
Within two years built up an organization that went from \$3 million in revenues at a loss, predominantly in product sales, into a profitable design/build group doing over \$10 million in cleanrooms. Recruited the design team, developed marketing strategy, participated in sales presentation and negotiation, negotiated supplier and trade contracts, supported cleanroom activity of parent company (Zellweger-Luwa). Provided technical oversight and review. Participated in the acquisition of Lepco Inc. Supported Luwa goal of penetrating U.S. bio-pharmaceutical market. Made presentations on ISO cleanroom design/construction standard on to ISPE annual meeting in Tampa. Performed work for a number of bio-pharma companies including Becton-Dickinson, Schering-Plough, PDC, Kendall, and others.
Vice President of Sales and Marketing, Luwa Lepco
Participated as part of leadership team of Luwa Lepco, specifically in the area of sales and marketing. Revised sales representative arrangement, integrated Luwa Bahnson and Lepco sales teams, interfaced with global corporate partners in seeking overseas projects. Dealt with major challenges associated with integrating two corporate cultures in transition period.
- 1989 to 1996 **Fluor Daniel**
Director, Electronic Facilities Engineering *1994-1996*
Developed and maintained core competency in design of microelectronics facilities. Recruited architectural, mechanical and process engineering personnel to serve as a resource for discipline engineers in electronic facility design. Technical and administrative manager of group. Proposal manager on numerous sales efforts.
Supervising HVAC Engineer *1991-1994*
Provided technical oversight to HVAC function in Greenville. Reviewed drawings for Amgen, Biogen, and Somatagen among others, in support of the Bio-Pharmaceuticals Business Unit.
Manager, Mechanical Design Department *1994*
Provided administrative oversight to 450-person design department covering fields of piping, fire protection, industrial engineering, HVAC.

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Internal Consultant

1989-1996

Provided HVAC and cleanroom design support to the Electronics Business Unit. Participated in proposal and client presentations. Participated in industry conferences on behalf of Fluor Daniel. Was active in Institute of Environmental Sciences Work Groups on clean room testing and design considerations.

Lead HVAC/Cleanroom Engineer

1989-1993

Served in lead engineering position providing conceptual design as well as detail design administration on a variety of major industrial projects, including NEC, Roseville; MEMC, Spartanburg; PHC, Korea; Taisil, Taiwan; Motorola, Korea.

1981 to **Clean Room Products Inc.**

1989 *Manager of CRE*

Managed CRE, the clean room design/build division of CRP, serving microelectronics, optics, pharmaceutical, precision assembly, fiber optics, chemical packaging, film and allied industries. Was responsible for design/construction of over 150 cleanroom projects from 100 to 25000 sq.ft. in cleanliness classes ranging from Class 100000 to Class 1 including a cleanroom for Merck and West Pharmaceutical.

1970 to **Northern Refrigeration**

1981 *Sole Proprietor*

Commercial refrigeration, heating, and air-conditioning installation and service company.

1965 to **Fairchild Hiller, Corp.**

1967 Product design work.

OTHER TEACHING EXPERIENCE

1965 to **State University of New York**

1978 *Adjunct Teacher*

Taught refrigeration and electrical courses to field technicians.

1974 to **City University of New York**

1981 *Tenured Professor*

Taught HVAC design and laboratory courses to technology students.

PROFESSIONAL CREDENTIALS

Professional Engineer, South Carolina No. 15464

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EDUCATION

Master of Business Administration (Management), Long Island University, Greenvale, NY
Bachelor of Aeronautical Engineering, Polytechnic Institute of New York, Brooklyn, NY

PROFESSIONAL MEMBERSHIPS

American Society of Heating, Refrigerating and Airconditioning Engineers (ASHRAE)

PUBLICATIONS

Books:

How To Make It In The Service Business; Business News Publishing Co., 1972, 1988
Systematic Commercial Refrigeration Service, Business News Publishing Company 1979
Servicing Commercial Refrigeration Systems, Business News Publishing Company, 1992
HVAC Controls, John Wiley & Sons 1981, 1988
Practical Clean Room Design, Business News Publishing Company 1995, 2000

Including:

Supplement on Affect of ISO on Microelectronic Cleanrooms
Supplement on Bio-Pharmaceutical Cleanroom Design Guidelines

Book Chapter

Chapter 3.3 "Clean-Facility Design, Construction and Maintenance Issues" Pharmaceutical Manufacturing Handbook: Production and Processes, edited by Shane Cox Gad; Published by John Wiley & Sons Inc, April, 2008

Technical Articles

"Where's the Magic?" Controlled Environments, September 2007
"Must Haves vs. Nice to Haves: Selecting the Right Cleanroom Construction Materials"
Clean Rooms, June 2006
"Filter Fan Units" Controlled Environments, June 2004
"Designing Clean Room HVAC Systems" Journal of the American Society of Heating, Airconditioning and Refrigerating Engineers, August 2001

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Mechanical Engineer

SELECTED INVITED PRESENTATIONS

- “The Clean, Green, Laboratory” Nanotech, Boston, MA, May 2006
- “Introduction to Cleanroom Technology”, Turnkey Conference, San deigo, CA 2005
- “Clean Build Construction” Turn Key Conference, Baltimore, MD April 2004”Sustainability and the LEEDS System” CMAA National Conference Proceedings, Washington DC, 2003
- “Specifying and Controlling Humidity in the Cleanroom”, Cleanrooms East, Philadelphia, PA 1999
- “Make-up Air Issues in the Cleanroom” Cleanrooms West, San Diego, CA 1998
- “Cost Savings Opportunities Using Membrane Ceilings” Cleanrooms East, Boston MA 1997
- “Cost Reduction of Cleanrooms with 100% Minienvironments” Annual Meeting, Institute of Environmental Sciences, Anaheim CA 1995
- “Impact of Minienvironments on Facilities Costs”, “17th IEEE/CPMT International Electronics Manufacturing Technology Symposium, Austin TX 1995
- “HVAC System Concerns in Upgrading to a Clean Environment” Cleanrooms East, Boston, MA 1993
- “Humidity Control in the Cleanroom” 31st Annual Technical Meeting, Institute of Environmental Sciences. Lass Vegas, NV 1985