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### **Summary of Qualification**

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- Over 35 years experience in the HVAC industry covering the following specific areas:

HVAC and piping system design	CHP Core Team member
Noise & vibration abatement	Lifecycle/Payback analysis
EPA Refrigerant issues and code compliance	HVAC Sales Engineering
Cost estimating bills-of-material	Control system design
Radiological containment ventilation design	Project Leader (PE)
HVAC systems field checkout, testing and troubleshooting	Building energy audits and studies
- Experience providing technical expertise to government agencies on behalf of FEMP's Technical Assistance Program and as a member of FEMP's CHP Core Team.

### **Work History and Accomplishments**

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- 1984 to present**     **Oak Ridge National Laboratory, Oak Ridge, TN**  
**Engineering Science and Technology Division, Commercial Buildings Group**  
**R&D Staff Mechanical Engineer**
- Providing technical expertise to government agencies on behalf of FEMP's Technical Assistance Program and also as a member of FEMP's CHP Core Team
  - Designing HVAC systems and directing related activities of drafting personnel; designing special ventilation systems for radiological containment facilities; designing low humidity and clean room air conditioning systems; CFC compliance specialist; cooling tower and chiller applications specialist
  - Writing construction and equipment specifications; testing and balancing air handling systems
  - Performing field inspection and check-out of HVAC systems; providing oversight of designs by AE firms; producing feasibility studies and design criteria
- 1972-1984**            **Rome-Eddleman and Associates, Knoxville, TN**  
**Account Manager/Application Engineer**
- Marketing to contractors and industrial firms
  - Preparing proposals
  - Troubleshooting and equipment installation assistance
- 1964-1966**            **General Electric, Large Jet Engine Division, Cincinnati, Ohio**  
**Associate Engineer**
- Analyzing production processes and production efficiency to guide development of process and material handling improvement initiatives
  - Compiling, reduced and analyzed jet engine test results for indications of stress and life cycle problems
  - Performing calculations and analysis relating to thermal stress in the low pressure turbine components for developmental jet engine

### **Education and Training**

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Postgraduate work toward M.B.A., University of Tennessee  
Postgraduate work in M.S. business curriculum, Xavier University, Cincinnati  
B.S., Mechanical Engineering, 1964, University of Tennessee  
Registered Professional Engineer, Tennessee  
Accredited LEED Professional by the United States Green Building Council  
EPA Certified Universal Refrigeration Technician

## Other Pertinent Information

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### ***Project Leadership***

- *2001 to present*: Providing technical expertise to various government agencies to enhance energy conservation on projects that have been selected to receive FEMP funded Technical/Design Assistance. Participating, as a member of the FEMP CHP Core Team, in the assessment and promotion of the potential of combined heating and power to effect energy savings and conservation of natural resources.
- *1998 – 2001*: Lead HVAC Engineer for the Spallation Neutron Source Conventional Facilities Design Group. Duties included: oversight and review of the Project Architect-Engineering's HVAC design of Conventional Facilities (worth approximately \$300M); responsible for all conventional facility energy conservation activities – including compliance with all Federal laws and statutes.
- *1994 – 1997*: Lead Engineer for all technical activities related to specifying, procuring and installing replacements for aging, CFC containing water chillers at the Oak Ridge National Laboratory. Thirteen chillers totaling approximately 7600 tons and containing 18,000 pounds of CFC refrigerant were replaced and new chillers procured on the basis of an evaluation of life cycle costs.
- *1994 – 1997*: Lead Engineer for the technical design tasks for a line-item project at the Oak Ridge Y-12 Plant involving conversion of 16 chillers from CFC to non-CFC refrigerants; replacement of a 625 ton, industrial, low temperature, process chiller; replacement of 6 aging, CFC-containing centrifugal chillers with new units employing non-CFC refrigerants; and, upgrade of 7 chiller equipment buildings to meet current ventilation and safety codes. All new chillers were procured on the basis of an evaluation of life cycle costs.
- *1994 – 1995*: Technical Advisor and member of the Ozone Protection Projects Committee at the K-25 Plant in Oak Ridge. Duties included: formulation of a plan to assure compliance with EPA requirements related to regulation of CFC and other refrigerants; oversight and management of the effort to survey and map all equipment containing 10 pounds or more of refrigerant for the entire site; initiation of a companion refrigerant inventory data base; production of a detailed report assessing the feasibility and cost for upgrading or replacement of aging refrigerant containing HVAC equipment in 7 buildings; and, technical leadership of the Title II design effort to replace the systems in 4 of those buildings surveyed.

### **Certification of Accuracy**

This resumé has been certified for accuracy by Michael L. Gregg on February 21, 2002, and by Jeffrey E. Christian, Center Director, ORNL Buildings Technology Center, on February 21, 2002.