TYLER G. COLWELL, P.E.

Licensed Mechanical Engineer – Nevada #010368 (Active since 1993) | NCEES Record
HVAC & Mission-Critical Systems | Forensic Engineering | Machinery Failure Analysis | Code Compliance

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Professional Summary

Mechanical engineer with 35+ years of continuous, hands-on experience in HVAC design, mission-critical facilities infrastructure, data center cooling, machinery diagnostics, and forensic engineering.

At age 27, independently designed a first of its kind rolling element bearing failure test rig, executed the research, and published the report showing the first-ever controlled bearing failure tests results proving proximity probes detect outer-race spalling orders of magnitude earlier than accelerometers — research now codified in industry standards **API 670 Annex N (USA)** and **ISO 20816-9:2020 (Global)**. Presented the research report at the 1993 Symposium on Industrial Applications of Gas Turbines Conference, Canadian Gas Association, Banff, Alberta.

In 2015, published the definitive plain-English guide to California Title 24-2013 data center cooling regulations in *Data Center Journal*, resolving widespread industry confusion and enabling compliant expansions.

From 2007–2025, I designed energy-efficient power and cooling infrastructure for 100+ data centers and large-scale HVAC systems for commercial/military facilities, exceeding ASHRAE, IMC, UFC, and IBC standards.

These works and projects demonstrate the same consistent trait: I derive solutions from first principles, document them with exceptional clarity, and deliver results that stand for decades. Retained on select litigation matters for analytical depth in HVAC failure, patent infringement cases, code compliance, and machinery diagnostics.

Publications & Technical Research

Colwell, T. (1992) “Performance of REBAM® During Ball Bearing Failures” – Parts 1 & 2, *Orbit* magazine (Bently Nevada / Baker Hughes), Vol. 13 No. 2 & Vol. 14 No. 1.

→ First controlled experimental study proving proximity-probe superiority for early detection of rolling-element bearing defects. Findings on probe placement relative to load zone and negative-spike signature incorporated into **API 670 Annex N** and **ISO 20816-9:2020**.

Colwell, T. (2015) "California Title 24-2013: The New Requirements and What They Mean for Your Data Center", *Data Center Journal*, July 22, 2015.

→ Authoritative industry guide that resolved widespread confusion over computer-room efficiency mandates and showed compliant, cost-effective data center expansion was readily achievable.

Colwell, T. (2015) "Automobile Accident Reconstruction Primer" – Independent 15-page technical treatise deriving conservation laws, skid analysis, and energy methods from first principles. Used as teaching reference by accident reconstruction engineers.

Professional Experience

Colwell ECS, PLLC – Reno, Nevada
Principal Engineer, 2025–Present

- Lead design and forensic analysis of large-scale HVAC systems for commercial and military facilities, ensuring compliance with IMC, UFC, IBC, and ASHRAE standards
- Provide expert consultation on mission-critical cooling failures, code disputes, and energy efficiency upgrades for data centers and industrial sites

Commercial HVAC / Data Center Design Engineer, 1999–2025

- Designed and specified power/cooling infrastructure for 100+ energy-efficient data centers across the U.S., optimizing PUE through economization and high-efficiency HVAC
- Conducted failure investigations for commercial HVAC systems, data center cooling, and rotating machinery
- Lectured on rotating machinery vibration diagnostics at Cal Poly State University, Mechanical Engineering Dept. (2015)

Bently Nevada Corporation – Minden, Nevada
Machinery Diagnostics Engineer / Researcher / Industrial Training Instructor, 1989–1999

- Independently conceived, designed, and executed groundbreaking 1992 research on rolling-element bearing monitoring, published in Orbit magazine; findings remain industry standard 33 years later
- Performed field diagnostics on turbines, compressors, pumps, and gearboxes worldwide, focusing on rotor dynamics and vibration analysis
- Developed diagnostic rules and training materials for HVAC-integrated rotating equipment

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Representative Technical Investigations (Litigation & Non-Litigation)

- Designed economization strategies for California data center construction and expansions under Title 24-2013/2016/2019, avoiding penalties while maintaining tier 3 and tier 4 uptime reliability
- Investigated chiller and air handling unit failures in commercial facilities, identifying root causes in construction defects and code non-compliance
- Provided vibration diagnostics and rotor dynamics analysis in turbine, pump, and compressor failures at electrical power generation stations and industrial processing facilities in the U.S.
- Conducted code compliance reviews for multi-site HVAC overhauls, per ASHRAE 90.1 and IMC standards for energy efficiency, and ASHRAE 62.1 for ventilation requirements.
- Consulted on data center cooling patent disputes, evaluating heat wheel energy recovery and economization designs.

Education

Bachelor of Science in Mechanical Engineering - Cal Poly State University, San Luis Obispo, 1988

Graduate School Studies in Mechanical Engineering - Pennsylvania State University, State College, PA, 1988-1989

Professional Licenses & Certifications

- Professional Engineer – Nevada #010368 (1993–Present, continuously licensed)
- NCEES Record

Professional Affiliations

- American Society of Mechanical Engineers (ASME)
- American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)
- Tau Beta Pi Engineering Honor Society

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[1] Above-mentioned documents are available as links below, or emailed as pdf files upon request:

- One page Capability Statement
- 2026 Fee Schedule
- Bearing failure research articles
- Data center design and code compliance article
- Accident reconstruction methodology primer