



COMPANY IDENTITY

Legal Name	Ziggurat Automation Inc.
Principal	 Mahmoud Mahmoud Hamwi, PE 'amwi
Location	Sacramento, CA — serving projects nationwide
Type	Specialized engineering services firm
Market Category	Data Center Protection & Controls Engineering
GTM Model	Subcontractor to AE/MEP/EPC firms
NAICS Codes	541330 (Engineering Services), 541512 (Computer Systems Design)

Professional Engineer License

License	Professional Engineer (PE) — Electrical
State	California
License Number	25919
Status	Active

CORE CAPABILITIES

- Power protection & controls engineering for mission-critical facilities
- Distributed Control Architecture (DCA) — eliminating centralized controller dependencies
- IEC 61850 GOOSE implementation and commissioning in production environments
- Protection relay/IED programming across major platforms (SEL, Woodward, CAT, ABB, EIG, Eaton)
- PRP network architecture design (IEC 62439-3)
- Generator controls integration and dispatch coordination
- EPMS/SCADA/HMI integration
- Systems engineering (requirements traceability, SysML, V-Model lifecycle)
- FAT/SAT procedure development and execution
- Commissioning and phased cutover support with rollback plans
- OT cybersecurity assessment and hardening (IEC 62443, NERC CIP)
- Legacy system modernization and protocol migration
- Technical training delivery for operations and maintenance staff

VENDOR PLATFORMS

- SEL
- Woodward
- CAT
- ABB
- Electro Industries (EIG)
- Eaton
- Cisco
- UPS OEM

STANDARDS & PROTOCOL EXPERTISE

- IEC 61850 (GOOSE, MMS, SCL)
- IEC 62439-3 (PRP)
- IEEE 242 (Buff Book)
- IEEE 1584 (Arc Flash)
- IEC 62443 (Cybersecurity)
- NERC CIP / NIST SP 800-82
- NFPA 70/70E, NFPA 110/111
- IEC 61131-3 (PLC Programming)
- IEC 62682 / ISA-18.2 (Alarm Mgmt)
- ISO/IEC/IEEE 15288 (Systems Eng.)

PAST PERFORMANCE — NASA DEEP SPACE NETWORK

Client	NASA/JPL (via Peraton)
Period	Design: Nov 2019 – Jan 2025; Implementation: Jan 2020 – ongoing
Role	Cognizant Development Engineer (CDE) and CI Technical Owner for Power System Controls
Scope	134 IEDs per complex design, 3 global sites (Goldstone CA, Madrid Spain, Canberra Australia), 2.4 kV MV powerhouse, 2(N+1) architecture

Key Deliverables

- Distributed control system architecture design (RTAC-based DCS with peer-to-peer GOOSE)
- IED programming across 8 manufacturer platforms (SEL, Woodward, CAT, ABB, EIG, Eaton, Cisco, UPS OEM)
- PRP dual-star network design (Cisco Catalyst 9500 + IE-2000)
- IEC 61850 GOOSE implementation for fast interlocking, load shedding, and trip commands
- Phased commissioning with operational continuity across all three complexes
- Technical training delivered to site engineers and technicians

The projects described were performed by personnel prior to the formation of Ziggurat Automation Inc. while employed by previous organizations. They are presented solely to illustrate the team's individual experience and competencies.

DIFFERENTIATORS

NASA Deep Space Network credentials

134 IEDs per complex, 3 continents, mission-critical 2(N+1) architecture — proven at the highest stakes

Predictable handoffs, fewer retests

Phased commissioning with rollback plans and documented hold points keep your schedule intact

DCA — first-time acceptance at witness testing

Distributed control architecture eliminates single points of failure. Rigorous FAT/SAT means no rework at certification

One team — design through commissioning

8 manufacturer platforms under single P&C scope. No coordination gaps between subs

TARGET MARKET

- AE/EPC/MEP firms serving Tier III/IV data center projects
- Project sizes typically \$10M+ electrical scope
- Multi-vendor relay/IED ecosystems
- Brownfield modernization with documentation gaps
- Commissioning risk mitigation needs

PUBLISHED TECHNICAL INSIGHTS

13 technical articles covering commissioning readiness, IEC 61850 GOOSE implementation, DCA methodology for Tier IV expansion, P&C subcontractor evaluation, and protocol engineering.

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