

Hyperion Power Services Overview



hyperionpowerservices

Trusted and Dependable Partners Since 2012

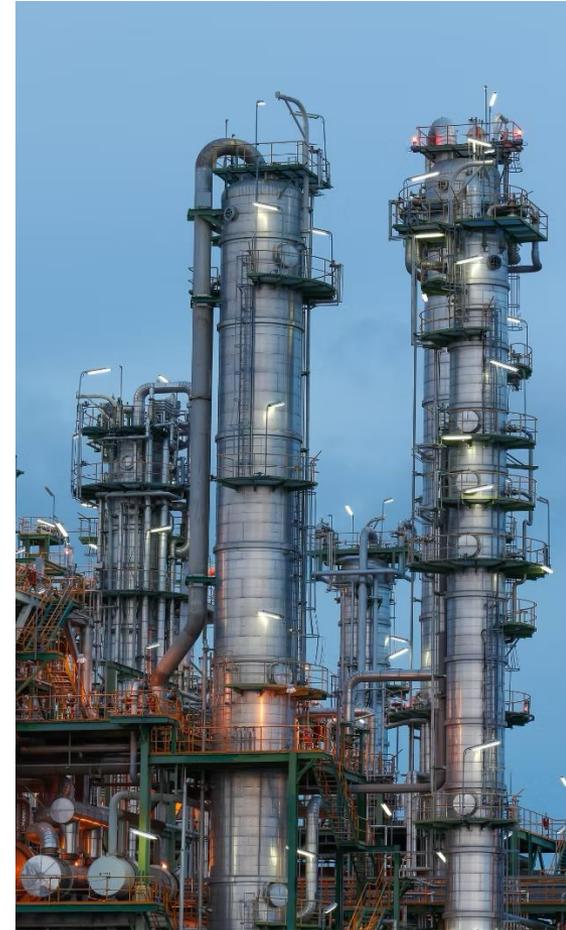
A Division of Hyperion Systems Engineering LLC

ABOUT THE HYPERION GROUP



Serving the Global Hydrocarbons, Chemicals and Power Industries

- Founded in 1993, Hyperion is a globally recognized private technology and engineering firm, offering expert advisory, consulting services, and advanced industrial IT solutions across the Hydrocarbons, Chemicals, and Power Generation Industries. We are renowned for our market reputation and our ability to serve a diverse international clientele.
- Our team comprises highly qualified professionals with extensive industrial experience, supplemented by a vast network of associate engineers and consultants. This ensures we deliver tailored solutions, meeting capacity and domain-specific needs with unparalleled expertise.



Technology and Engineering
for a Better World

Worldwide Customer Base Across
Industries

More than 500 projects in 51 countries
with more than 200 customers served



HYPERION GROUP FUNCTIONAL STRUCTURE



Our Divisions Offer a Range of Services to Meet All Types of Needs



Consulting, advisory services and systems solutions in the areas of manufacturing operations and supply chain management optimization.



Dedicated space to encourage innovation, process industry related research, and technological upgrades that create value to our customers, society and the environment.



Providing comprehensive consulting, advisory, and extensive engineering and project support services for power plant owners and operators.



Technology, equipment, software solutions and specialized services to both operating companies as well as engineering & construction companies.



HYPERION GROUP LEADERSHIP



**Symeon
Kassianides**
Founder & CEO

Led the group through technical and geographical growth including 3 business transformations, 2 acquisitions, 1 divestment and 1 carve-out. Several years of service as Board Member on government and private companies. PhD Chemical Engineer (MIT, Imperial).



Stavros Spanos
Deputy Group CEO
Hyperion Energy and
Consulting CEO

With Hyperion since 2001 in various sales, marketing and business development roles. Six years in Russia to setup and run Hyperion Russia. Several years of service as Board Member on government and private companies. Mechanical Engineer, MBA (NTUA, Cass).



**George
Kassianides**
Hyperion Power
Services CEO

With Hyperion since 2012. 40 year technical/managerial career in Defence and Power Generation industries. Retired as Director Latin American Projects for Siemens Energy. Aeronautical/Mechanical Engineer (UL, U of Penn, Villanova. PE).



Our Vision

**To Be The Most Trusted Advisor, Partner,
and Preferred Provider of Engineering
Solutions for the Power Generation, and
Transmission and Distribution Industries**



Our Mission

- Utilize the extensive knowledge of our multi-disciplined team of specialists, consultants, and executive staff with the majority having more than 30 years experience in the power industry
- Implement the resources of our alliance companies and Hyperion Group, to serve our clients in all aspects from feasibility studies to commissioning and startup of power plants
- Advise on most cost-effective approaches to achieve and maintain highest possible safety, reliability, availability and profitability, always cognizant of environmental impact
- Use highest ethical means to defend our customers' interests, to ensure their success, and become a member of their team



Our Capabilities and Services

- Strategic Assessments
- Owner's Engineer Services
- Forensic Engineering Studies
- Expert Witness Services
- Sub Synchronous Resonance (SSR) Mitigation
- Lifetime Extension (LTE) Consultation
- Power Plant Improvement, Betterment, and Evaluation Services including Cycle Analysis
- Feasibility and Advisory Studies
- Project Management Services
- Project Engineering Management Services
- Up Front Engineering Coordination
- Plant Construction and Commissioning Support
- Plant Condition Assessment Audits and Recommendations
- Operating Plant Maintenance Contract Negotiation Support
- Operating Plant Maintenance Implementation
- Technical Field Services
- Contract and Negotiation Support
- Civil Engineering and Structural Design
- Project Health Checks
- Claim and Change Order Reviews
- Project Control Services
- Acoustics and Noise Control Services
- Emissions and Acoustics Risk Assessments and Contingency Planning
- Emissions Testing and Continuous Emissions Monitoring Systems
- Power Plant Modeling and Simulation
- Permitting Process Support
- Combined Heat and Power (CHP) Capabilities
- Renewable Power Consultation



Worldwide Customers in Power



Luminescent Heat Engine



TEMPLE GENERATION SF LLC



THE LAW OFFICES OF SCHIROTT, LUETKEHANS & GARNER, LLC

The HPS Business Model Allows Delivery of a Large Range of Services to a Global Customer Base at a Competitive Price

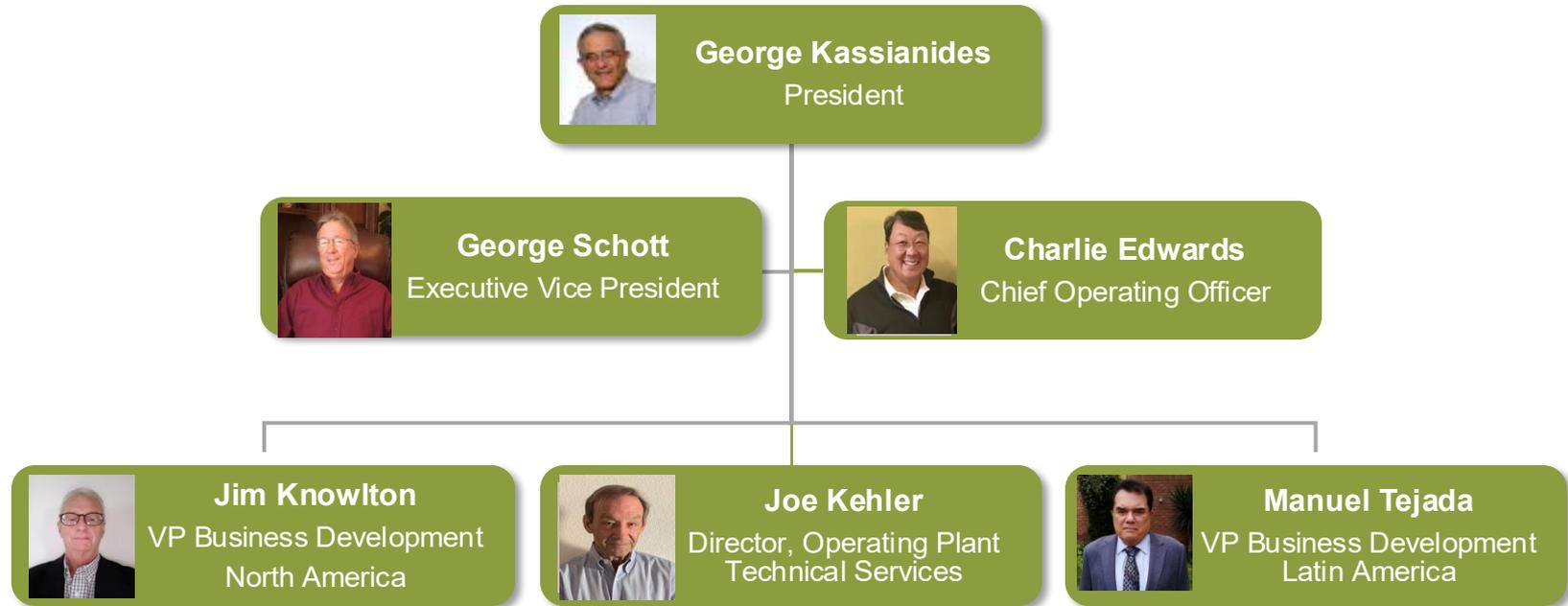


Proven Power Generation Knowledge
The HPS core team of world class engineering consultants understands the challenges of the power industry and can formulate appropriate solutions that will benefit its customers, mitigate risk and maximize project returns

Globally Experienced Workforce and Worldwide Support Team
HPS consultants average more than thirty years of experience with projects in all corners of the globe and are supported by the corporate business support services of the parent company (HSE) who have offices in ten countries on four continents

Strategic Partnerships and Associations
For more than forty years, the HPS senior management has developed strategic partnerships and cultivated long standing business relationships with other power industry participants which can be engaged with our clients

HPS Organization



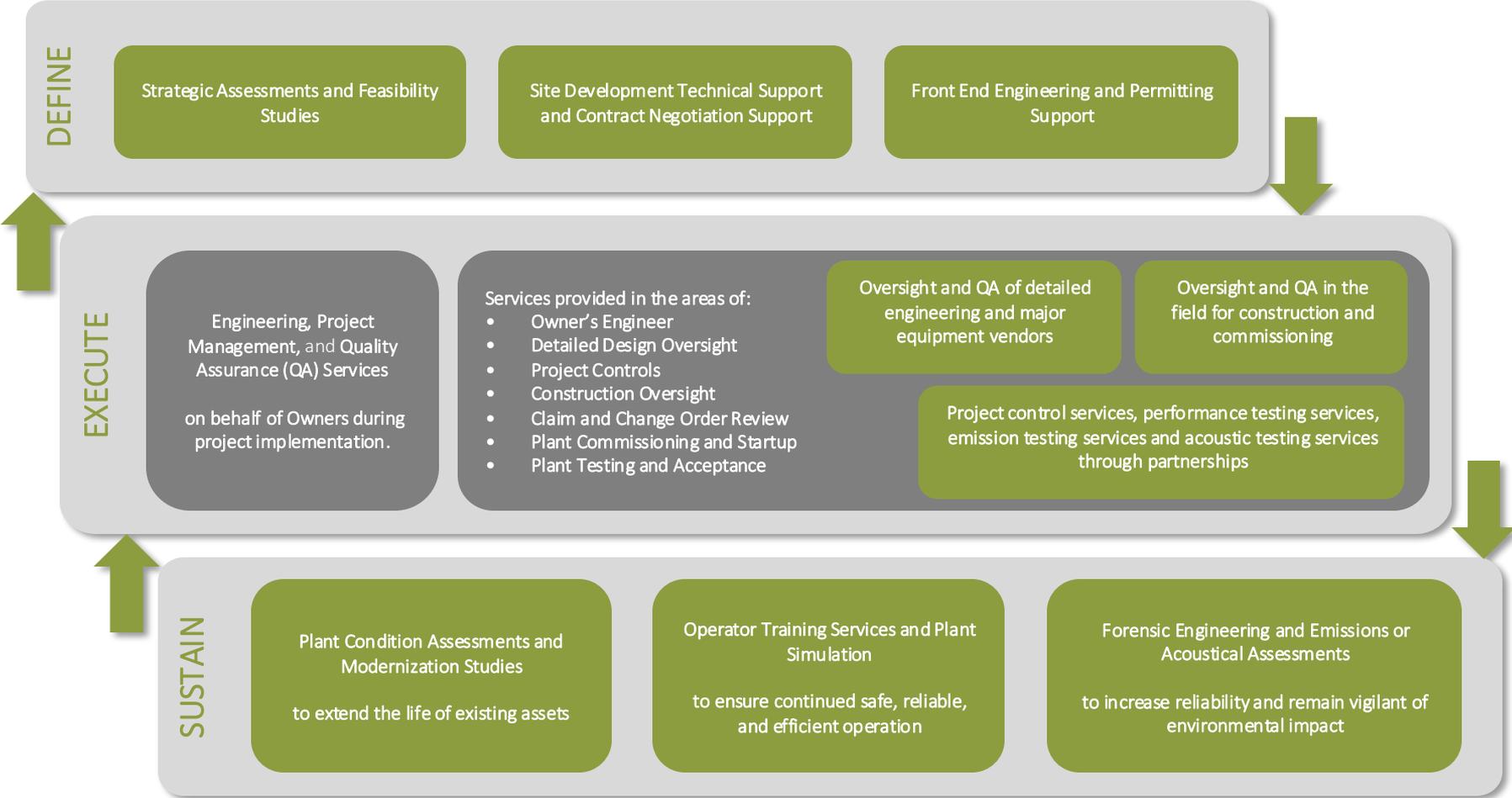
- ✓ Gas and Steam Turbine Experts
- ✓ Generator Experts
- ✓ Project Managers and Directors
- ✓ Engineering Managers and Directors
- ✓ Project Site Managers, Construction Managers, and Engineers
- ✓ Commissioning Managers
- ✓ Mechanical Equipment Experts
- ✓ Electrical and Control Experts
- ✓ Cycle Design and Performance Experts

- ✓ Grid Stability Analysis Expert
- ✓ Heat Recovery Steam Generator and Boiler Experts
- ✓ Wind Energy Project Management Experts
- ✓ Acoustics and Noise Control Expert
- ✓ Plant Chemistry Expert
- ✓ Civil/Structural/Piping Expert
- ✓ Project Controls Expert
- ✓ Supply Management Directors
- ✓ Environmental Engineering Expert

- ✓ Gas Turbine Mods and Upgrades Expert
- ✓ Civil Engineering Expert
- ✓ Operating Plant Service Consultants
- ✓ Sales and Marketing Consultants
- ✓ Project Development Director
- ✓ Quality/Business Process Improvement Leader
- ✓ Renewable Power Consultation
- ✓ Coordination of Services in Peru
- ✓ Translator
- ✓ Technical Writer

Hyperion Power Services

Delivery Methodology



Hyperion Power Services

Top Six Current Projects



Client	ValiaEnergía
Location	Mexico
Project	Performing a root cause analysis of the vibration issues on the Bravo River CLR TG31 drive train.
	Under Execution



Client	Orygen
Location	Peru
Project	Providing expertise to review technical specification work scope for a minor hot gas path inspection of a Siemens V84.3A1 gas turbine.
	Under Execution



Client	SAAVI Energia
Location	Mexico
Project	Performing review and root cause analysis of magnetic chips in the lube oil sump of a TM2500.
	Under Execution



Client	Thermal Tech, Inc.
Location	Florida
Project	Performing a high-level value assessment of the 1x1 cogeneration equipment at the Reedy Creek Energy Center.
	Under Execution



Client	Siemens Energy, Inc.
Location	Canada
Project	Coordinating multiple organizations for the review of project specifications and scopes of work for the Pickering Nuclear Station refurbishment.
	Under Execution



Client	Orion Digital Infrastructure
Location	Various Sites
Project	Providing project management consulting services for future projects.
	Under Execution

Inkia Energy



This letter is to express our gratitude to the Hyperion Power Services (HPS) team for the excellent support provided to Inkia Energy for more than a decade. Throughout this time HPS has been a key allied in Inkia's successful Operations, Maintenance and Growth of our business.

ENGIE Energia Peru



We would not hesitate to recommend the HPS team for Owners Engineering services for Combined Cycle Projects anywhere in the world.

Kallpa Generacion S.A.



This letter is to express my sincere appreciation and commendation for the exceptional contributions and outstanding performance the Hyperion Power Services (HPS) team has demonstrated in your role at Technical Consultants to our company, for the last 15 years. Your dedication, hard work, and commitment to resolving our technical issues have significantly contributed to the success of the KALLPA team.

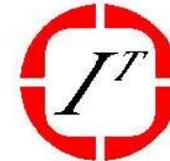


- Under the leadership of the Director of OPTS and his staff, this offered service will help mitigate or resolve operating plant technical issues
- Goal is to achieve the highest possible safety, reliability, availability, maintainability, and consequently profitability, always cognizant of environmental impacts
- OPTS has access not only to the multi-disciplined HPS team of consultants, and the consultants of the parent company HSE, but also the resources of our partners: The Energy Corporation, Nexus PMG, Serprotech, and others
- Our objective is to gain the client's confidence to call OPTS first and allow HPS to either find solutions internally, or use its very extensive network to find the right agency who will solve the particular problem
- OPTS will also advise on new plant construction how to write the Long Term Maintenance Agreements and support negotiations

Renewable Power Consultation



- Wind and solar energy is the future of economical power generation. Our team of engineers have been dedicated to all aspects of power projects since the 1970s.
- We are confident our capabilities can support your project with the talent, expertise and resources for successful installation, operation and maintenance of solar and wind turbine projects
- Hyperion Power Services familiarity with the various aspects of ISO/RTO, utility, environmental concerns, interconnect facilities, safety regulations, construction management, commissioning and developer interconnection requirements provides a strong platform to act as the Owner's Engineer function



- **The Energy Corporation** (<http://www.tenergy.com>) is a leader in power plant design and consulting, offering Owner's Engineering services to the power industry
- **Shanahan Engineering** (<https://www.shanahanengineering.com>) is a leading energy services company renowned for constructing and commissioning complex power plants globally.
- **Instrumentation Technology** (<http://inst-tech.com>) provides Generation Sub-Synchronous Resonance (SSR) protection, substation fault recorders, SSR damping controls, wide-area power system monitoring, and control solutions for improved power system equipment reliability for the power generation industry

All share a common vision of becoming trusted advisors, partners, and preferred providers for our clients worldwide



- **Nexus Program Management Group** (<http://www.nexuspmg.com>) is a project consulting and technology firm offering Project Controls Services including project scheduling, cost estimating and risk modeling and assessment
- **Turbopower International** (<https://turbopowerinternational.com>) offers mechanical/chemical engineering design and root cause analysis services for a wide spectrum of industries, including the power generation industry. TPI has water/steam chemistry program review, process control, piping system, fluid system packaging, civil/structural design/stress analysis, new product design and production transition design services
- **Mostardi Platt** (<http://www.mostardiplatt.com>) is a national leader in environmental health and safety, testing, assessment, compliance and consulting services, and has the experience, equipment, and technology to handle the full range of needs for projects of all sizes

All share a common vision of becoming trusted advisors, partners, and preferred providers for our clients worldwide



Serprotech Energy



Turner Business Services LLC
Energy Products and Services

- **United Dynamics Corporation** (<http://udc.net>) provides boiler inspection services, HRSG inspection services, NDE boiler inspection, certified weld inspections, pre-outage planning, outage management, technical consulting, and QA/QC and repair follow-up for the power generation industry
- **Serprotech Energy** (<http://serprotechenergy.com>) is a service company dedicated to provide management and complete solutions in the areas of field services, labor, materials, equipment and spare parts supply to support the Oil & Gas, Power Generation, Industrial and Petrochemical sectors in Latin America
- **Turner Business Services** (<https://sites.google.com/site/turnerpowergenreps>) is an energy and power generation manufacturer's representative agency dedicated to supplying quality technologies to power generation BOP equipment, T-G mechanical components and parts, instrumentation and controls, and services

All share a common vision of becoming trusted advisors, partners, and preferred providers for our clients worldwide

Hyperion Power Services Differentiators



Establish Executive level **relationships** promoting **effective communications**



Breadth and **depth** of experience in the power generation industry



Recognized specialist skills and **proven** world class **expertise** in the industry. Readily available expertise.



Global experience and delivery capabilities including **presence in emerging markets**



Driven to provide the most **effective customer solutions**



Competitive low overhead cost model, rely on parent company business support, and strategic alliances' technical and manpower support



Flexibility to engage with customers following different business models



Commitment to excellent customer relationships

Thank You



George Kassianides, President



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Summary of Past Projects

Past Projects



Client	Location	Project Scope
Confidential Client	Peru	Determined flexibility analysis for Chilca 1 & 2 plant cycling of the units with different dispatch scenarios.
Confidential Client	Peru	Performed a root cause analysis of failed gas turbine combustors.
Inkia Energy Chile	Chile	Performed a root cause analysis to establish the reason for a generator failure and witness repair at factory.
Confidential Client	Middle East	Developed specifications for major balance of plant equipment for a combined cycle plant.
Kallpa	Peru	Investigated transportation and container manufacturing options for 3 unbladed gas turbine rotors from Peru to Charlotte, North Carolina.
Kallpa	Peru	Performed inspection of refurbished gas turbine rotor in Charlotte and developed plan to package and transport to site. Witnessed the refurbishment of the gas turbine rotor for Unit 2.
Inkia Energy	Peru	Performed a root cause analysis for a steam leak at the high-pressure flange on Kallpa steam turbine.
Confidential Client	United States	Performed root cause analysis for a generator failure during major inspection. The cause was established, and the generator was repaired.
SAAVI Energia	Mexico	Performed detailed metallurgical evaluation of new heat recovery steam generator harps and gave the green light to install them in unit 1.
New Fortress Energy	Mexico	Performed condition assessment of degasification plants and offered recommendations for improved availability and reliability.

Past Projects (continued)



Client	Location	Project Scope
Inkia Energy	Peru	Identified a manufacturer who would build a container to transport the Kallpa gas turbine rotor and other 2 rotors from Peru to Charlotte and back.
Inkia Energy	Peru	Performed post upgrade heat balance for Kallpa using the EBSILON code and used the results to evaluate several different heat rate reduction ideas.
Inkia Energy	Peru	Investigated the feasibility of capturing CO2 from the exhaust stacks of the Kallpa and Las Flores plants and using the CO2 in the Peruvian marketplace.
Temple Generation SF LLC	Texas	Performed particulate matter fence line monitoring and gas turbine inlet fouling root cause analysis (RCA).
Kallpa	Peru	Performed inspection of refurbished gas turbine rotor in Charlotte and develop plan to package and transport to site. Witnessed the refurbishment of the gas turbine rotor for Unit 2.
Confidential	United States	Performed root cause analysis of a forced outage due to generator failure.
SAAVI Energia	La Rosita, Mexico	Performed a failure investigation of recently installed harp tubes in the HP Evaporator and determined if the failures were a result of manufacturing errors.
TermoChilca	Peru	Performed a root cause analysis of the catastrophic failure of combustor 11.
Las Flores	Peru	Performed an investigation of excessive vibration of gearbox, working with Siemens Energy.
Mitsubishi Power Americas	Utah	Performed a Sub-Synchronous Resonance (SSR) evaluation for a 2-unit J installation under construction in the USA.

Past Projects (continued)



Client	Location	Project Scope
Inkia Energy Peru/Kallpa Energia	Peru	Performed cycle analysis, definition of plant upgrades, and development of specifications for major balance of plant hardware including participation in vendor selection and factory acceptance tests.
TermoChilca	Peru	Performed a root cause analysis for the failure of a DVDT that resulted in a forced outage.
Kallpa	Peru	Performed an Investigation for non-CAPEX way to reduce plant heat rate.
Kallpa	Peru	Provided specialized engineering support to address correction curve questions from COES.
PrimeEnergia	Colombia	Performed borescope image analysis of foreign objects ingested in a 70 MW steam turbine and provided recommendations to remove, repair damage, and advise on operability.
Siemens Energy	Argentina	Provided commissioning support for the T3000 DCS control system for the bottoming cycle of the Ensenada Plant.
TermoChilca	Peru	Provided technical support to review and help negotiate the LTSA with OEM.
Luminescent Power	Worldwide	Performed market search and evaluation of high efficiency industrial compressors to support a new technology concept.
Associated Electric Cooperative, Inc.	Missouri	Performed acoustical evaluation and root cause analysis of the excessive vibration of the simple cycle exhaust stack at the Essex Plant.
Siemens Energy	Lima, Peru	Determined the risk of failure due to SSR of the Las Flores Plant open and combined cycle operation and evaluated risk after COES adds two 500kV lines with capacitors.

Past Projects (continued)



Client	Location	Project Scope
Inkia Energy Peru/Samay Energia	Peru	Performed a Sub-Synchronous Resonance (SSR) failure investigation and mitigation for Puerto Bravo.
OPC - HADERA	Israel	Performed a boroscopic photograph review and evaluation of the Hadera Israel power plant Units 10 and 20 blades and compared the TBC loss from the blades observed and reported by prior investigations.
Inkia Energy Chile/Colmito Energy	Chile	Performed a root cause analysis (RCA) to establish cause of failure of the Colmito Rolls Royce Trent A65 Low Pressure Turbine first stage, working with Siemens Energy, Rolls Royce and Inkia Energy.
SNC Lavalin	Maryland	Provided litigation support against the OEM for the water ingress damage to main power generators during storage.
Inkia Energy Peru/Samay Energia	Peru	Performed an investigation of apparent cracks in two generator rotors on one of their combined cycle plants.
Inkia Energy Chile	Abu Dhabi	Performed an inspection of a Trent 60 gas turbine and provided recommendations of components to be repaired, discarded, or replaced.
Siemens Energy	Lima, Peru	Participated in the evaluation of excessive boiler feed pump vibration levels and recommended additional analysis to establish acceptable vibration limits.
OPC - ROTEM	Israel	Performed thermal cycle analyses and established BOP constraints following proposed upgrade.
Kallpa	Peru	Performed an evaluation of CAPEX and OPEX due to OSINERGIN Resolution 161-2019-OS/CD on all of their thermal plants.
ENEL Peru	Lima, Peru	Performed an evaluation of CAPEX and OPEX due to OSINERGIN Resolution 161-2019-OS/CD on all their thermal plants.

Past Projects (continued)



Client	Location	Project Scope
Zomet Energy	Israel	Provided negotiation support to Mitsubishi Hitachi Power Systems Americas on their proposed Long Term Maintenance Agreement.
Turbine Technology Services Corporation	Saudi Arabia	Performed evaluation of maintenance procedures for Siemens Energy plants.
TermoChilca	Peru	Performed an investigation of combined cycle plant water chemistry issue (excessive use of ammonia) and boiler feedwater pump excessive vibration.
Inkia Energy	Peru	Performed thermal cycle analysis of existing combined cycle plant and made recommendations for plant upgrades.
OPC Energy	Israel	Performed a root cause analysis and condition assessment of the GE Frame 6F.01 compressor and turbine at the Hadera Plant.
Hammerhead Resources	Alberta, Canada	Performed a condition assessment of TransCanada Combined Cycle equipment in storage.
Kallpa	Peru	Provided Technical Field Assistance supervision of major steam turbine overhaul (General Electric D11).
Nexus Project Management Group	USA	Provided technical and commercial support for claim recovery for Cabot/Cleco and Ponca Boiler projects.
Seminole Electric Cooperative, Inc.	Florida, USA	Provided consulting support for a greenfield Combined Cycle plant in the design phase.
Jamaica Private Power Company Ltd.	Jamaica	Performed a condition assessment for reciprocating engine combined cycle plants and major equipment repair/replacement.

Past Projects (continued)



Client	Location	Project Scope
SNC Lavellin	Maryland, USA	Performed a condition assessment of gas and steam turbine generators and served as expert witness at Keyes Energy Center.
ENERSUR	Peru	Performed a rotor air cooling piping failure investigation and subsequent redesign.
Shirott, Leutkehans & Garner, LLC	Chicago, USA	Provided an acoustical engineering evaluation and served as expert witness for proposed asphalt plant.
Siemens Energy, Inc.	Orlando, USA	Performed a modularization and transportation study of heat recovery steam generators.
IC Power	Chile	Performed a Sub-Synchronous Resonance (SSR) risk analysis for the Chilean grid.
IPP	Peru	Performed a technical due diligence of a combined cycle power plant acquisition.
Seminole Electric Cooperative, Inc.	Tampa, USA	Performed an EPC scope of work review for a 1,050 MW combined cycle project.
Black & Veatch	Ohio, USA	Provided consulting services for monitoring rotor replacement.
Sulpay Energia	Peru	Performed a failure mode analysis of turbines at Puerto Bravo (with Turbine Technology Services and General Electric).
I Squared Capital	New York, USA	Performed a due diligence for acquisition of assets in Latin America.

Past Projects (continued)



Client	Location	Project Scope
Kallpa	Peru	Performed a condition assessment for Ilo Plants 3 and 4.
ENGIE	Peru	Provided Owner Engineer and Site Engineering services for the Chilca Plus Combined Cycle Plant.
Nexus Project Management Group	USA	Developed claim packages for the Basin Electric and Leidos Projects.
SNC Lavallin	North Carolina, USA	Provided an expert evaluation of gas turbines in storage.
Puerto Bravo, IC Power	Peru	Performed an acoustical evaluation of exhaust stacks and plant compliance at Puerto Bravo.
Duke Energy Peru	Peru	Performed a due diligence for a power plant acquisition.
Ethos Energy	Oklahoma, USA	Performed thermal cycle analyses of a PACE 260 combined cycle plant to evaluate various performance upgrades.