

# O & M

## Executive Summary



USP&E was founded in 2002 in the USA and has operated in Globally since 2006. We have worked in . . .

**NORTH AMERICA, ANGOLA, MALI, SIERRA LEONE,  
GUINEA, TANZANIA, LIBERIA, NIGERIA, SOUTH  
AFRICA, DRC, GHANA, DJIBOUTI, LIBYA, MADAGASCAR,  
GUATAMALA, MADAGASCAR, AND KENYA.**

Since inception, USP&E has purchased and sold over 700MW of gas, HFO, and diesel engines and turbines in a variety of industries including cold storage in the USA; telecommunications projects in US; Canada and Africa; and Oil and Gas all over the USA, South America, Africa, and Asia.

Since January 2016, USP&E has supplied over 150MW of gas turbines and engines to the utility market in Europe. By way of example, since 2006 we have designed, sold, and commissioned:

- A 13MW HFO power station in Guatemala for Perenco Oil in 2014;
- A 20MW Wartsila HFO plant (purchased in India second hand) for a mining project in Chile;
- A 16MW HFO plant for a London mining concern in Sierra Leone;
- A 40MW Power station in Guinea for a Brazilian client;
- A 18MW custom power station order for a maritime industry client;
- A 36MW plant in Mali for an Australian client; and
- A 32-engine customized generator order for a large mining operation in Panama, which we designed and manufactured through an OEM we often use in Italy.

AS SUCH, USP&E IS A MAJOR SUPPLIER OF POWER GENERATION EQUIPMENT TO THE GLOBAL UTILITY AND INDEPENDENT POWER PRODUCER (IPP) MARKETS.



# OPERATIONS & MAINTENANCE EXPERTISE

USP&E HAS SUCCESSFULLY OPERATED AND MAINTAINED POWER STATIONS ACROSS AFRICA AND NORTH AMERICA FOR THE LIKES OF:



(SEE REFERENCES)

USP&E WOULD BE HONORED TO SUPPLY OPERATIONS AND MAINTENANCE SERVICES TO YOUR NEXT POWER STATION PROJECT.

THIS DOCUMENT PRESENTS AN OVERVIEW OF OUR POWER GENERATION QUALIFICATIONS THAT WE BELIEVE WILL MEET AND EXCEED YOUR EXPECTATIONS.

USP&E currently has contracts for design, EPC, operations and maintenance of multiple power stations in West Africa, South Africa, the USA and Canada. Through 12/31 2016 USP&E records show we have provided installation, operations and maintenance services that allowed for the production of over 2,943,360,000 kWh's.

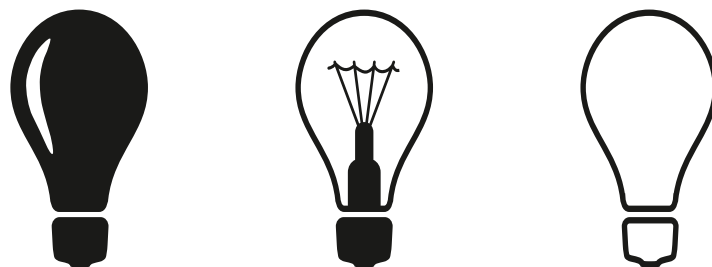
We have summarized our O&M methodology, experience and references in this document to showcase the unique value we bring to your project, value that will be critical in realizing the long-term viability and economic sustainability of your renewable and thermal power station projects.

# USP&E'S WORLD CLASS RENEWABLE AND CONVENTIONAL O&M TECHNOLOGIES

As a recognized and award-winning O&M power station contractor with references from some of the largest companies in the world, USP&E is well positioned to care for your power station. And this is critical as your O&M contractor provides a 'safety net' for the plant owner ensuring that the plant will be operated and maintained to guarantee reliability, availability, and output in the most efficient manner possible.

Acting as both the Commissioning Agent and the O&M Service Provider, USP&E will guarantee the electricity output at a fixed price. Whereas many firms in the USA and Europe will have difficulties calculating their risks for such an undertaking, USP&E is an African firm that addresses risk head-on and through the experience of over 15 years doing business operating and maintaining power stations across the Continent.

USP&E's online performance and condition monitoring software, "SMARTpower" allows us to manage and review plant performance in real time, and allows all stake holders to do the same. Collecting operating data continuously throughout each operational month provides all shareholders the opportunity to analyze and make decisions on the performance and lifetime of the entire plant, from a holistic perspective.



THIS PLATFORM OF CONTINUOUS IMPROVEMENT IS THE BACKBONE  
OF WHAT "THE USP&E DIFFERENCE" IS ALL ABOUT.



# SUMMARY OF USP&E O & M STRENGTHS

## Operations & Maintenance Services Designed for Rural Africa

Complete outsourcing of operations and maintenance services with onsite local national technical and safety training programs.

## On-Site Technical Support Services

Specialized support services to improve overall plant performance, including Six Sigma cost reduction strategies, feedstock fuel efficiency optimization programs, and E-Tap electrical load optimization and analysis tools.

## Biomass and Conventional Fuel Management Services

The supply chain management in any biomass or conventional project is of critical importance. A wide range of experience and expertise to ensure that a plant's performance and reliability are maximized when using organic feedstock to create energy through steam turbines.

## Online Management Reporting

Real time remote annunciation of all critical systems and inventory management for maximum transparency and ease of access to O&M management reporting for all stakeholders.

## Environmental Health & Safety Programs

Extensive health, safety, and environmental management systems and programs that meet or exceed our client's own EH&S program requirements.

## Project Experience

With a heritage in design, procurement, construction, and installation of biomass, HFO, and natural gas power station projects throughout the world, we have earned a reputation for excellence by combining technical know-how with practical experience.

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In conclusion, we thank you for the opportunity to present a summary of the unique value that USP&E brings to your project power plant to be installed and commissioned in the coming months. We trust that this presentation results in the final selection of USP&E as the Operations & Maintenance contractor for your important and exciting project.

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# USP&E'S RENEWABLE AND CONVENTIONAL POWER STATION O&M APPROACH

At USP&E, we believe that a big strength of our company is in our approach. We value the importance of leveraging resources in remote areas for the benefit of all stakeholders. USP&E has already invested significant resources in our offices in the USA, South Africa, and Lebanon in order to ensure each O&M project is a success. Additionally, USP&E meets regularly with various stakeholders from both the public and private sector, across the emerging world, in order to stay on top of recent regulations and incorporate cutting-edge technological advancements in general plant maintenance. We work with all major OEMs for spare parts, tooling, and major services support, as needed. Through the course of time we have gained a unique first-hand knowledge of the commercial, political, economic and environmental importance of this sector and much experience across countries in the emerging world.

As a local Johannesburg-based firm, we understand the challenges many our customers face daily, whether political, social, economic, or environmental. We also appreciate the invaluable transformational aspects of the opportunities our clients' projects bring to impoverished regions, both to local communities and to all shareholders.

## USP&E'S

### LOCAL PRESENCE

USP&E successfully works in remote areas of Africa to power African businesses and empower African people. That commitment is seen in our focus on training, accountability, sustainability, and energy efficiency. In fact, our founder and CEO relocated 3 years ago to Johannesburg to lead our efforts in Africa and is now a permanent resident.

We are proud to work for a company so absolutely committed to improving the energy infrastructure of Africa. We feel that this further establishes our brand as a premium Africa-based, Africa-owned, and Africa-managed product and service offering.

## USP&E'S WORLD CLASS

### ENERGY PLANT O&M TEAM

USP&E's proposed O&M Team Roster is truly impressive. In the favorable position of having one of the most uniquely and varied power plant EPC&M experienced individuals in the world in our employ. Our entire team have the critical skills required to run your Power Station.

USP&E believes that our ability to provide such a highly qualified O&M team for this project, with the pre-requisite skills at the right price, is a key differentiator from the other bidders. We believe that USP&E's O&M Team's contributions will be instrumental in making your project a long-term success.

# USP&E OPERATIONS & MAINTENANCE OVERVIEW

USP&E Africa is a leading provider of O&M services in the power generation industry. In order to illustrate the scope and depth of our experience in providing O&M services, we are presenting below our philosophy and standards that govern each of our O&M projects.

## USP&E MAINTENANCE PHILOSOPHY

USP&E understands that the millions of dollars that power plant owners initially invest on their equipment is often only a fraction of their total cost of ownership over the project life cycle. It is strongly recommended that a dedicated and experienced O&M specialist manage the service and maintenance of the power station assets with a view of ensuring energy efficiency and asset life extension targets are maintained while keeping reliability above 99% with good constant fuel efficiency.

## MAINTENANCE STANDARDS

USP&E provides expertise where it makes the most sense so our customer can achieve greater equipment availability and reliability. We do this by following a quality assurance program that encompasses quality control processes that pays for itself. These processes follow global standards that measure true quality, such as ISO 9000-2008. We established these processes to ensure that the equipment is maintained according to manufacturer requirements.

USP&E maintains a professional documentation department that keeps up-to-date manuals on important tasks and topics for maintaining equipment and providing standards for operations. For example, our Environmental Health and Safety Plan details the specific job responsibilities of each employee, as well as documenting the safety, health, and environmental responsibilities.

Our documentation library includes practices and procedures on topics such as:

- Engine Calibration for Optimal Efficiency
- Calibration of resistance temperature devices
- Maintenance and cleaning of key electrical and mechanical components
- Predictive maintenance and advanced diagnostics

Our extensive training programs provide good practice for a systematic approach to on-the-job training programs.



# O & M BEST PRACTICES

USP&E adheres to the U.S. Department of Energy's Operations & Maintenance Best Practices guide. There are five well-defined elements of an effective O&M program, operations, maintenance, training, administration, and engineering.

While these elements form the basis for a solid O&M organization, the key lies in the well-defined functions each brings to the company. USP&E uses the most aggressive standard operating procedures (SOPs) available to achieve or exceed key performance indicators.



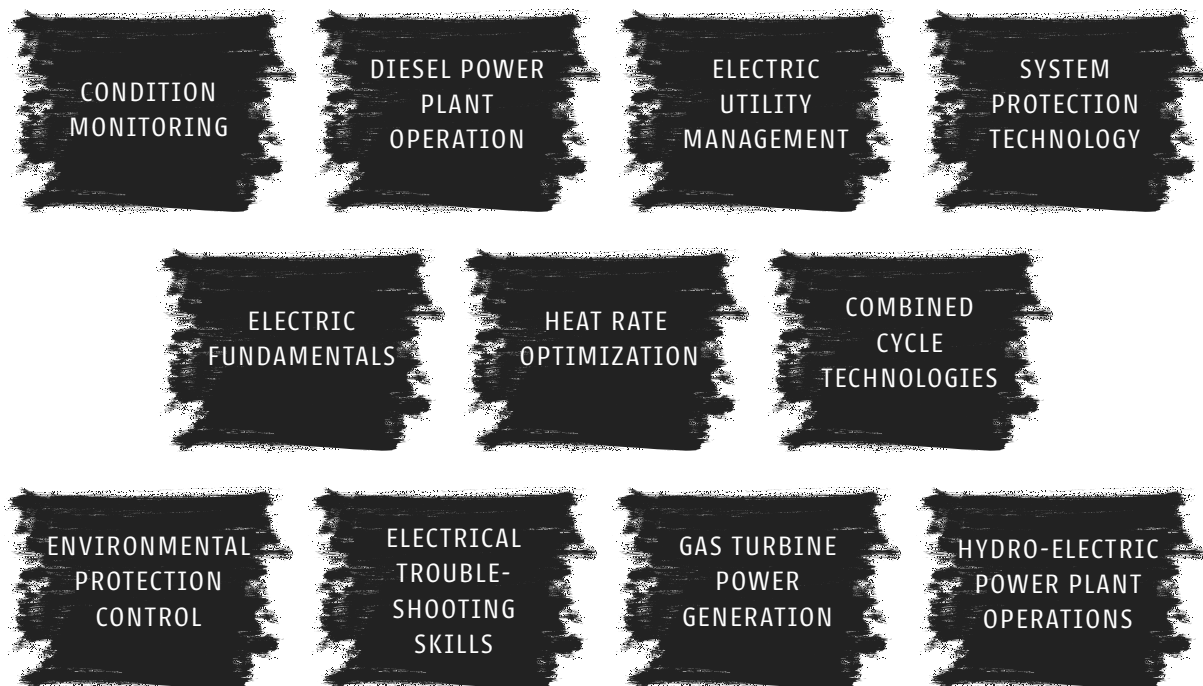


# O & M TRAINING

USP&E is an experienced integrator and installer of power plant systems. We understand the importance of training operators to assume operation and maintenance activities. USP&E uses proven training practices to help the staff become comfortable with the facility equipment and processes.

USP&E uses a variety of training techniques, with a primary focus on practical demonstrations and hands-on operation. The on-the-job training is comprehensive, and trainees are taught the full repertoire of policies, procedures, operations, and functions necessary to perform their jobs or to train others in the use and maintenance of the power plant operation.

The following is a brief list of topics and tasks that should be covered in training courses:



Daily, weekly, and/or monthly meetings are held with employees. Training by USP&E leaders includes not just maintenance activities, but discussions and promotion of quality assurance measures in all aspects of the plant. Training involves engineering conduct, customer service, environmental, safety, and health topics.

USP&E documents on-the-job training performances and results. Lesson plans are created for individuals. Team leaders use various check lists, forms, and other training guides to track progress.

We provide valuable feedback to employees on the spot so that any actions can be corrected or enhanced. Employees go through an evaluation phase, which culminates in performance testing.



# REPORTING & EQUIPMENT PERFORMANCE MONITORING

Communication, collaboration, and coordination between team members and management are important elements for keeping the project on track. A variety of methods of reporting, tracking performance, and plant equipment monitoring are used by USP&E.

USP&E's O&M manager prepares informative project reports that detail critical components, tasks, and activities that occur throughout the project lifecycle. This reporting process provides a higher level of detail for analysing the status of project tasks.

For example, reports from the Daily Log can be run on plan revisions, calls, visitors, inspections, deliveries, accidents, and manpower on site. The O&M manager can also track status by hours worked, type of time worked (e.g., regular vs. overtime), and the cost code for every task completed.

## WHAT TO EXPECT FROM USP&E

# GENERAL SCOPE OF WORK

## PRE-COMMISSIONING PHASE

Generally, before the O&M phase of this project begins, USP&E will travel with senior engineering staff to visit the various OEMs involved in supplying the equipment for this project. These meetings are critical to the proper design and final organization of the plant. They also allow for introductions and high level training to begin well in advance of commissioning. During the entire course of construction, key members from the USP&E Africa O&M team will participate in site visits to the Project Site; with increasing frequency as the equipment is installed. USP&E Africa believes that assisting our Clients and various shareholders throughout the installation, commissioning, and performance testing phase of the equipment is critical to a proper and successful handover to the Operations team. USP&E's presence during this phase will also provide the opportunity to evaluate progress and anticipate any additional improvements, punch lists, and enhancements to the facilities (such as workshops, office space, etc.), that may be needed at the site during the first year of operation.

### A GENERAL OVERVIEW OF USP&E'S SCOPE OF WORK FOR THE PRE-O&M PHASE INCLUDES THE FOLLOWING:

- Initiate hiring and recruitment practices for skilled tradesmen positions, as well as formulating a plant-specific training plan.
- Initiate training of commissioning and operations staff pursuant to USP&E's Quality Assurance Plan; Health, Safety, and Environment Plan; and OEM requirements.
- Provide experienced technicians to assist with every aspect of the commissioning and transition to operations and maintenance phase.
- Provide input to the EPC Contractor on site layouts and drawings during design meetings and strategy sessions.
- Finalize and communicate with Owner regarding plant work areas, lay down areas, such as office space, maintenance shop, warehouse, etc.
- Work with and support the Owner on fuel supply and management matters.
- Provide advanced operations and maintenance, control room operations, and technical training to senior USP&E O&M staff at the OEM factories as needed.
- Engage EPC and OEMs with USP&E's pre-commissioning checklists and coordinate with all parties to prepare for commissioning.
- Work with Owner and EPC contractor to test and commission the plant equipment, including preparation of test results, if necessary, and punch list items to be addressed.
- After installation and testing, USP&E will monitor engines and data transmissions from the EPC contractor; test alarm systems and other monitoring systems.

## GENERAL SCOPE OF WORK

## OPERATIONAL

## PHASE

USP&E offers flexible, site-specific O&M programs with field-proven policies and procedures that ensure a project's success. Your USP&E team has broad field O&M experience working on the full spectrum of power generation technologies, including combustion turbines, steam turbines, reciprocating engines, boilers, geothermal, and renewable energy assets, in first world and emerging markets.

As a third party contract operator, USP&E believes that our performance goals must be fully aligned with the customer's financial targets in order to leverage the economic potential of the energy generating asset.

## COMPLETE O&M SERVICES

USP&E offers complete outsourcing of operations and maintenance services and provides 24x7 operations and maintenance of power generation facilities.

USP&E implements O&M programs emphasizing worker health and safety, maximizing plant equipment reliability, availability, and performance.

USP&E manages major maintenance activities, such as routine and overhaul outage planning and execution.

## O&M PROCEDURES & TRAINING

USP&E prepares standard operating procedures (SOPs) unique for each project and implements plant-specific training programs at one or more plant sites.

## MAINTENANCE PLANNING

USP&E prepares preventative maintenance plans, schedules, and procedures, and then integrates them with our predictive online maintenance software program called SMARTpower.

## PROJECT MANAGEMENT

USP&E provides experienced project management teams that take a project through the entire process including pre-commercial checkout, operation during startup, plant commissioning, and commercial operation.

## INSTRUMENTATION & CONTROLS

USP&E provides experienced I&C technicians capable of performing DCS software updates, modifying/updating existing DCS systems, and providing instrumentation calibration and checkout services

## PLANT STAFFING

USP&E provides technical specialists and project management personnel through all phases of a project, including development, engineering, construction, commissioning, and ongoing operations and maintenance.

USP&E hires plant personnel and assists with plant employee relations.

USP&E provides benefits administration in compliance with laws and regulations.

## ADMINISTRATION

USP&E sets up processes for accounting and finance systems, such as purchasing and inventory control, payroll, accounting, and administrative training. Common accounting and finance systems can be setup for multiple plants for consistent financial reporting.



## DETAILED LIST OF O&M SERVICES FOR A SAMPLE THERMAL POWER STATION

In addition to the maintenance tasks detailed further in this section, USP&E Africa will provide the following services during the operational phase of this project:

Operate and maintain the main boilers, steam turbines, generators, and condensers.	Operate and maintain the conveyor system that transports the sugar cane tops and leaves to the boiler
Operate and maintain the electrical HV, MV, and LV switchgears system, substation, and transformers.	Operate and maintain the water treatment plant.
Perform all preventive, predictive, corrective, routine, and annual maintenance tasks at the plant, as described more fully herein.	Operate and maintain the emergency diesel generator 400V.
Operate and maintain the cooling towers and chemicals injection systems.	Operate and maintain the UPS system with 2 invertors 230V single phase for continuous operation.
Provide feedstock management and measurement functions.	Initiate all warranty monitoring procedures; monitor equipment for defects.
Provide skilled labor, including management, supervisory and skilled tradesmen positions, and provide security for all O&M personnel.	Manage and maintain spare parts.
Operate and maintain the pump station approximately 4,5 km from the plant. The pump station will consist of two electrical pumps and one diesel emergency pump. The station will be operated and monitored from the main control room, with periodical local inspection to the pumping station by the O&M personnel.	Communicate via reports, meetings, etc. to Owner on specified scheduled basis.
Housing accommodations: USP&E Africa often purchases land near the project site and builds housing for our key O&M staff. We will keep the Client updated on these efforts as the EPC phase of the project proceeds.	Work closely with the Owner regarding the dispatch of electricity generated at the plant.
	Coordinate with any governmental authorities regarding environmental regulations.
	Provide ongoing classroom and virtual and on-the-job training to all staff from senior managers through to day laborers, with an emphasis on safety training, predictive performance analytics and fuel efficiency optimisation.



## FUEL OIL, GAS AND BIOMASS MANAGEMENT SERVICES

The key to operating a reliable and successful power plant begins with reliable fuel supply agreements. In order to maximize uptime and asset life, while optimizing output, USP&E recognizes and has seen the value in having Plant Operations and Fuel Management work closely together to ensure feed stock is kept to the highest quality standards possible.

USP&E's O&M personnel provide a wide range of experience and expertise to ensure that a plant's performance and reliability are maximized. The true cost of feedstock goes beyond the price paid to fuel suppliers. Fuel Management Services include strategic planning, fuel procurement, handling, testing (visual and laboratory), and storage of oil / biomass fuel. USP&E have optimized operational run time and achieved higher annual generation through rigorous and focused fuel management.

Total fuel cost savings are not usually seen in a reduction of the cost of fuel per ton. The savings are recognized in the total tons required to produce the same generation output, improved plant performance, decreased maintenance costs, higher availability, and consistent year-over-year generation. Fuel suppliers must receive continual feedback on the quality and heating value of the fuel delivered, not just a cost per bone dry ton. This must be measured and documented by competent and professional staff and recorded and disseminated using trusted, state-of-the-art software such as USP&E's SMARTpower.

### THE PRIMARY OBJECTIVES OF USP&E'S FUEL MANAGEMENT SERVICES ARE:

Manage the storage of fuel to minimize fuel degradation and environmental impact.

Proactively ensure that fuel delivered to the power station meets or exceeds USP&E fuel quality (mass, humidity, calorific value, etc.) planning protocol.

Work to ensure that the fuel supply area is clean, orderly, and safe in order to meet plant production targets.

Ensure that all USP&E staff are trained on fuel inventory, measurement, and safety in order to ensure optimal power output is achieved at all times.

Overlay current market data with relevant plant fuel usage data in order to optimize biomass fuel purchases, transportation, and delivery costs.

Engage public agencies in support of long-term viability of biomass power.



## THE USP&E PROMISE

“We will put the health and safety of all staff members as a first priority, while also optimizing the economic return of the plant for the customer through excellence in O&M services.”

## OFFICES

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Sample reporting documents and smartpower screenshots can be supplied per request.

