

Provecta Process Automation LLC – Services Summary

“Your Partners in Performance” – Professional providers of advanced automation and operation solutions to US power utilities.

Our Aim

To provide customised, specialist control and operations solutions to US power utilities, partnering as enablers to:

- **Improve plant flexibility**
 - Increase range of operation, both for low load and maximum output – adaptive control design
 - Improve load ramping rate – overfiring design and retuning
 - Fuel flexibility – setpoint and dynamic adjustments for fuel type changes
 - Frequency response
 - Reduce startup times (Sequence automation design, startup setpoint automation)
- **Improve plant efficiency (and lower CO2 emissions), with design enhancements including**
 - Advanced (model-based) steam temperature control
 - Implementation of Sliding Pressure operation while retaining AGC ramping capability
 - PA Bus pressure automatic optimisation
 - Air-cooled condenser performance optimisation – dynamic fan sequencing.
- **Improve plant robustness – enhancements, tuning and training**
 - Full system tuning guidance: actuator performance analysis; benchmarking; open/closed loop tests; system identification/analysis/simulation; optimisation.
 - Adaptive tuning parameters; decoupling
 - Pulverizer anti-choking control
 - Runback optimisation: design, tune and test
 - Process protection reviews – redundancy and failure modes, SIL studies, design, test.
 - Trip analysis and reporting
 - Simulation-based training in power plant control design and loop tuning: fossil power plant-specific, delivered in 6 countries.
- **Improve Operational environment**
 - Alarm management
 - Design philosophy and Alarm Manual development
 - Achieving better than EEMUA/ISA target performance
 - Ongoing review (remote monitoring and analysis) and design modifications
 - HMI and operational change projects:
 - High performance HMI customisation and design appropriate for environment
 - Control room ergonomics: layout options, lighting, operator functions, transition strategies
 - Automation and protection design for reduced attendance and control facility centralization
 - Operator training
 - Control system functions and operation
 - Advanced situation and contingency event training (steam properties, process dynamics, runbacks, fault analysis)

Capabilities

Provecta's directors and our other senior engineers have all spent their careers in the power plant control and operations industry. They have been previously employed by power generators and understand the commercial, operational and regulatory environment in which their clients function.

With well over 250 years' combined experience in this field, Provecta has developed a strong reputation as a professional, highly successful solution provider who employs the most stringent of quality management practices, enabling us to consistently deliver very successful outcomes to highly complex engineering challenges. A detailed statement of our capabilities in power plant controls, client list and project examples is available upon request.

Partnering

In the US, Provecta provides highly sought-after expertise to resolve difficult control issues that impact on plant availability, reliability and performance. This is achieved by investigating, reporting and designing engineered control solutions that are typically implemented by the client according to their configuration and security processes. Provecta then reviews, tests, optimises and provides comprehensive documentation for maintenance, operations and training.

Solution Examples

Below are some examples of modulating control solutions Provecta has implemented, both in Australia and the USA. In addition, Provecta has specified and overseen the complete implementation of single push-button startup automation on both drum (12) and supercritical (3) units.

- Unit Co-ordinated controls – Design, testing and tuning of
 - Advanced fuel overfiring and model-based pressure setpoint modification to improve load ramping rates;
 - Adaptive unloading controls for fuel systems and air-cooled condensers to maximise unit output;
 - Unique, settable frequency services response (FCAS) design for fast and slow profiles.
- SH Steam temperature
 - Design and implementation of a unique high-order adaptive Smith Predictor design on drum boilers;
 - Advanced steam temperature control retrofit on supercritical once-through units.
- Pulverizer Control Optimisation
 - Implementation of Provecta's own pulverizer choking protection design that influences both feeder speed and air flow to maximise mill output.
- Sequence automation design and implementation for
 - Air/Gas systems;
 - Coal mills;
 - Feedwater heaters;
 - HP/LP Bypass systems.
- Low load operation projects
 - Fuel dynamics, feedwater flow and steam pressure and temperature control enhancements.
- Fuel Flexibility Projects
 - Retuning setpoints and modulating control loops;
 - Upgrading coal BTU calculations to dynamic model-based designs.

Clients include

Bechtel Corporation; Doosan Heavy Industries; B&W; LG&E; KU; Prairie State Generating Co.; We Energies; EPRI; AGL (Australia); Stanwell Corporation (Australia); Intergen, Toshiba.

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