**Rotary Kiln Data Acquisition and Controls Upgrade Project**

**Project Goals:**

**Primary Goal (Core Project Driver):** Improve operational consistency of the rotary kiln.

**Secondary Goals (Critical Project Elements):**

* Increase internal knowledge of rotary kiln controls, and control systems in general
* Thoroughly document process, and build robust knowledge base (i.e. prevent point-person dependence).

**Exploratory Goals (Potential Gains/Improvements determined during project):**

* Increase operational flow rate
* Increase process reaction yield
* Reduce/eliminate clinker rings in the kiln
* Reduce kiln brick degradation

**Project Objectives:**

**Stage 1: Dusthouse & Rotoclone**

1. Digitize the temperature and pressure gauges of the rotoclone
   1. Replace the manual gauges for digital transducers.
   2. Collect historical data to begin collecting trends.
2. Reestablish the dusthouse control system, while updating to digital from pneumatic.
3. Develop control system for ‘west’ and ‘north’ gates of the rotoclone. These are pressure and temperature regulating gates, respectively.
   1. Development dependent on historical trend analysis.
4. Develop documentation for new system. Hold trainings for technical, operations, and control systems teams.

**Stage 2: Rotary Kiln**

1. Adapt flame controller system into new control schema. (From Yokogawa to HC900)
2. Add digital IR temp sensors to various points along the length of the kiln to begin evaluate steady state temperature profiles.
3. Upon review for effectiveness, implement long flame and short flame radiamatic sensors to assist in flame hot zone evaluation.
4. Develop documentation for new system. Hold trainings for technical, operations, and control systems teams.

**Stage 3: Flame Train**

1. Incorporate switches into new control schema where possible. Replace switches which are not PLC compatible to PLC compatible variations.
   1. Includes solenoid valves, motor start/stop (blower), low/high pressure switches, pilot detection, and presence switch (main gas valve ‘off’).
2. Add digital pressure gauges to orifice plate flow meters (combustion air, atomizing air, and gas).
   1. Alternatively, replace orifice plates with new flow meter design.
3. Develop documentation for new system. Hold trainings for technical, operations, and control systems teams.

**Technical Team:** Chandra Kodali, Eric Van Horn, John Ataman, Bobby Miller

**Operations Team:** All grain plant operators, Duane Steelman, Chandra Kodali, Srikant Danireddhi, John Ataman (optional).

**Control Systems Team:** John Clause, Bobby Miller, Conrad Kacsik (select company members), Tim Hastings, other PLC-capable Zircoa electricians.