

**Fusion Integrated Solutions, LLC**

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**Established:** 2004

**Staff:** 80 Engineers & Designers  
**Safety:** 0.86 EMR

**Industry Codes:**

UNSPSC: 81100000  
NAICS: 541330, 541341, 541420  
SIC: 8711, 7373 (CAD), 7371 (IT)

**Officers:**

Seaphes R. Miller, P. E.  
Principal, Chief Executive Officer

★ **2014 State of Wisconsin  
Outstanding Large Business  
Award**

★ **2010 State of Wisconsin  
Outstanding Small Business  
Award**



**Corporate Profile**

Fusion Integrated Solutions was founded in Milwaukee, Wisconsin in 2004 to provide multi-disciplined engineering consulting services.

Fusion celebrates its 10-year anniversary of providing client-focused engineering services, enabling its Clients to meet their operational objectives by providing proven & innovative technological solutions at a great value.

**Qualifications**

Integrating new processes. Upgrading and optimizing legacy systems. Designing processes to deliver new requirements. Fusion's experienced team of technical resources provides a range of Engineering and Design services that deliver solutions to solve paper production challenges.

- Program & Project Planning
- Process Optimization, Analysis
- Front End Engineering, Study Evaluations
- Modeling, Layouts
- Process, Concept Development
- Detailed Design Engineering
- Control Systems Design, Programming
- Commissioning, Pre-startup, Construction, Start-up Support



Fusion's solutions improve Clients' operations, with outcomes including:

- Improved Reliability
- Reduced Operating & Capital Cost
- Improved Product & Process Quality
- Improved Personnel & Process Safety
- Rapid Product Change-over Capability
- Throughput Improvement

Fusion's track record of success includes project execution in the Industrial and Commercial sectors. Industrial Clients include leading manufacturers in the Pulp & Paper, Converting, Power Generation, Food Processing & Packaging, and Beverage Processing & Packaging industries. Fusion's commercial success includes the City of Milwaukee, State of Wisconsin, and the US Department of Defense. Fusion's average professional services fee is approximately \$250,000 (~\$3,125,000 Total Installed Cost).

**Certifications, Licenses**

- Professional Engineering (PE)
- Profession Designer of Engineering Systems (HVAC)
- Leadership in Energy and Environmental Design (LEED)
- Project Management
- Six Sigma
- LEAN Manufacturing Systems
- National Fire Protection Association (NFPA)

**Design, Programming Platforms**

- |                    |            |
|--------------------|------------|
| ➤ ROCKWELL/A-B     | ➤ SIEMENS  |
| ➤ HONEYWELL        | ➤ FOXBORO  |
| ➤ WONDERWARE       | ➤ ABB      |
| ➤ EMERSON OVATION  | ➤ GE/FANUC |
| ➤ GIDDINGS & LEWIS | ➤ MODICON  |
| ➤ WESTINGHOUSE     | ➤ YASKAWA  |
| ➤ FISHER-PROVOX    | ➤ DELTA V  |
| ➤ RELIANCE         | ➤ BAILEY   |
- 
- |                        |              |
|------------------------|--------------|
| ➤ AutoCAD              | ➤ Solid Edge |
| ➤ CEA/Plant 4D         | ➤ SolidWorks |
| ➤ BENTLEY Promis-e     | ➤ RISA       |
| ➤ BENTLEY MicroStation |              |

**Diversity Status**

- Equal Opportunity Employer
- U. S. Small Business Administration 8(a)
- Disadvantaged Business Enterprise (DBE)
  - Wisconsin Unified Certification Program
  - Commonwealth of Massachusetts
  - Ohio Department Of Administrative Services
- Minority Business Enterprise (MBE)
  - National Minority Supplier Development Council
  - Wisconsin Department Of Commerce
  - Ohio Department Of Administrative Services
  - Commonwealth of Massachusetts
- Small/Emerging Business Enterprise Program (SBE/EBE)
  - City of Milwaukee
  - Milwaukee Metropolitan Sewage District
  - City of Cincinnati

**Services**

Fusion supports its Clients throughout the entire engineering life cycle, providing full-service engineering solutions through its multi-disciplined portfolio:



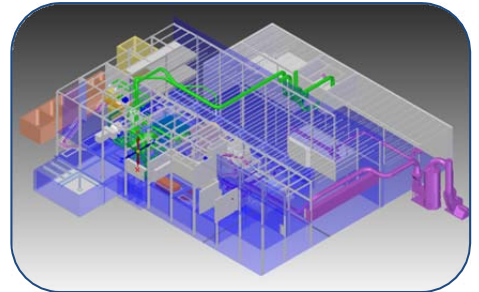
Our project success has been driven by expertise in 3-Dimensional Engineering and Design capabilities, enabling the integration of OEM and Custom Designed equipment into existing processes, Facilities-to-Machine interfaces, and providing optimum designs at a tremendous value.



Fusion's Consumer Products Automation Solutions Expertise include the following technologies:

➤ **Overall**

- Plant & Process/Production Line Layout & Design
- Chemical & Process Delivery Systems
- Plant and Process System Optimization
- Energy Management & Environmental Control Systems
- Equipment-Facility Interface
- Personnel & Equipment Guarding & Safety Systems
- Reprographics, Documentation, As-Builts

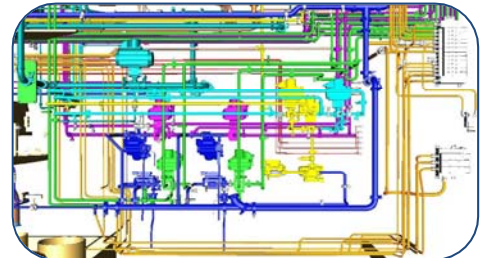


➤ **Process Engineering & Process Piping**

- Process Development Integration
- Process Definition, Design Criteria
- Mass and Energy Balances, Capacity Calculations
- Raw Materials, Utilities Balance/Consumption Calculations
- Process Simulations, Modeling
- Process Flow Diagrams, P&ID's
- Process & Combustion Safety Studies
- Pipe Stress Analysis
- Equipment Selection, Design
- Options Analysis
- OEM Equipment Integration
- Utilities (Gas, Steam, Electric) & Facilities-to-Machine Integration
- Mobile Skid Design
- Water Supply & Waste Water Treatment, Distribution Systems

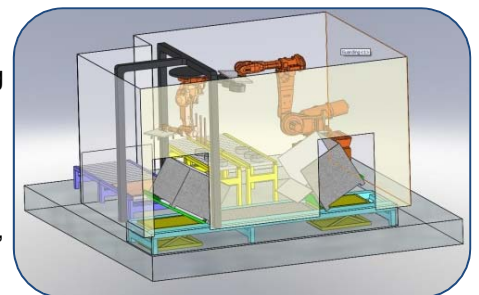
➤ **Mechanical Engineering & Machine Design**

- High-speed Equipment Integration
- Equipment Layouts, Specification
- Design, Detailing
- Clean-In-Place
- Finite Element Analysis
- Raw Material & Trim Handling
- Product, Packaging & Finished Product Handling
- Product Processing
- Sorting/Laning
- Wrapping & Cartoning, Case Packing, Sealing, Bagging
- Product & Package Accumulation Systems
- Pack Loop Optimization
- Palletizing, De-Palletizing, Stretch Wrapping, Case/Pallet Handling
- Process & Personnel Heating Ventilation & Cooling



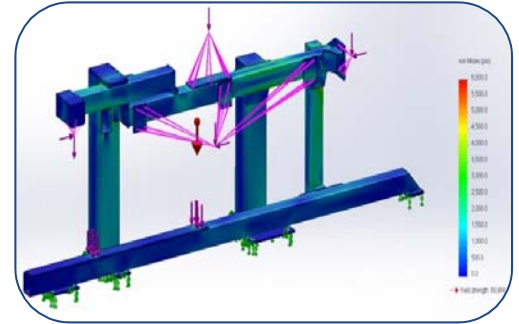
➤ **Power, Controls & Information Systems**

- Instrumentation – Calibration, Specification, and Commissioning
- Industrial Data Acquisition and Analysis
- Mechanical & Process Control/Automation Systems
- Hydraulic and Pneumatic Controls
- Advanced Control Logic Strategy Development, Implementation
- Power Systems Evaluations: Load, Power Factor, Arc Flash, Harmonic Analysis, Protective Device Coordination
- Safety Compliance Design, Programming
- Supervisory Control and Data Acquisition (SCADA), Networked Control
- Remote Plant Monitoring & Control, Mobile Application Development
- Camera/Vision Inspection Systems, Lighting Design



➤ **Civil – Structural - Architecture**

- Personnel Access Structures (Platforms, Stairs, etc.)
- Equipment Supports
- Finite Element Analysis
- LEED Design
- Building Design
  - Structural Steel
  - Concrete
  - Pre-cast Concrete
  - Masonry
  - Timber
- Facility Rendering

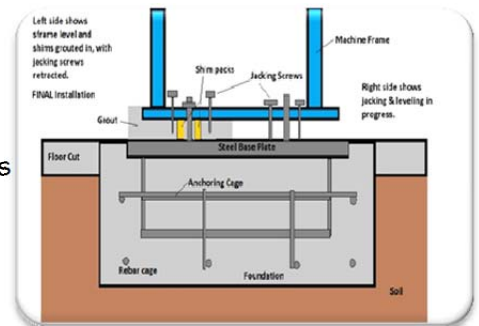


➤ **Program & Project Management**

- Project & Initiative Portfolio Development, Management
- Master Plan Development
- Cost & Schedule Management
- Vendor/Contractor Selection & Management
- Change Management
- Bid Preparation & Reviews

➤ **Construction Supervision & Management**

- Pre-Startup Inspections, Checklists
- Start-up and Commissioning Support
- Project Reporting
- Engineer-Procure-Construction Management (EPCM) Solutions
- Concept Development → Start-up
- Engineering Led Design-Build Solutions
- Procurement: Vendor Neutral

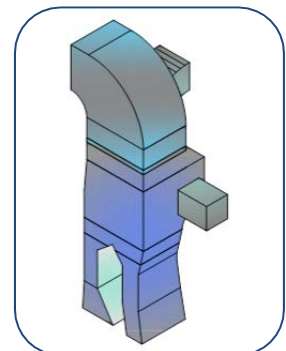


➤ **Reliability Engineering & Operational Excellence**

- Clean – Inspect – Lubrication (CIL) System
- Machine & Process Rapid Product Change-over
- Reliability Studies & Modeling (Statistical Process Control)
- Life Cycle Asset Management (LCAM)
- Risk Management
  - PHA – Preliminary Hazards Analysis
  - FMEA – Failure Modes and Effects Analysis
  - CA – Criticality Analysis
  - SFMEA – Simplified Failure Modes and Effects Analysis
  - MI – Maintainability Information
  - FTA – Fault Tree Analysis
  - ETA – Event Tree Analysis
- Six Sigma (6σ), 5S, and LEAN Methodology

➤ **Industrial Hygiene, Safety & Environmental Engineering**

- Personnel Safety Program Assessment & Development
- Personnel Safety Equipment & Process Design
- Machine Guarding & Operational Design
- Industrial Ergonomics
- Process Safety Engineering & Design
- Construction Safety Engineering
- Process Air, Plumbing, Fire Protection



**Our Experience – Energy Generation Systems, Facilities – Fossil Fuels**

Fusion's Utilities/Facilities Engineering Expertise include the following technologies:

- **Engineering Design Management**
  - Project Scope Development
  - Engineering, Detail Design, Programming
  - Purchasing Support
  - Installation Support
  - Checkout/Startup/Training Support
  - Boiler MACT Compliance
- **Fuel Storage & Delivery Systems**
  - Coal Yard Handling & Preparation
  - Coal Car Unloading Facilities
  - Fire Protection Systems
  - Fuel Oil/Natural Gas
  - Biomass/Alternate Solid Fuels
- **Boiler Systems Integration**
  - Stoker Feeders, Fluidized Bed
  - Recovery, Syngas, Package Boilers
  - Cyclone Burners
- **Turbine/Generator Systems Integration**
  - Turbine Rebuilds
  - Generator Rebuilds
  - Cooling System Upgrades
- **Plant HVAC, Environmental Control, Ancillary Systems**
  - Process Air Systems
  - Fly Ash and Coal Dust Handling/Control Systems
  - Deaeration Systems
  - Complete Duct Work Layout
  - Fire Protection
  - Feedwater Systems
  - Condensate Return
  - Water Intake/Supply, Waste Water Treatment
  - Fugitive Dust Control
  - NOx / SOx Control
  - Baghouse, Scrubbers System Design
- **Power, Controls & Information Systems**
  - PLC System Design, Programming
  - Pneumatics & Hydraulics Control
  - Burner Controls & Combustion Safeguards
  - Lightning Protection, Lighting Design
  - Distributed Control Systems
  - Process Instrumentation & Controls
  - Power Distribution – Low-Medium Voltage Motor Control, Coordination
  - Motion & Machine Control (DC, AC Variable Speed, Servo)
  - Supervisory Control and Data Acquisition (SCADA), Networked Control
  - Remote Plant Monitoring & Control, Mobile Application Development
  - Industrial Data Acquisition, Analysis & Reporting
  - Human-Machine Interface (HMI)
  - Camera Systems (Inspection, Monitoring)



### **Fusion's Health, Safety & Environment Values**

"Enhancing the lives of our Team, Clients, and Community!"

Fusion is committed to protecting our number one asset, "our people", through a long-standing and ongoing commitment to HSE in all aspects of our operations.

Fusion believes each Fusion Team Member has the right to derive personal satisfaction from his/her job and the prevention of occupational injury or illness is of such consequence to this belief that it will be given top priority at all times. Consequently each Team Member has the responsibility to be a HSE leader by taking ownership of his/her own safety, making the health and safety of people around them their primary concern, and working with our clients to help them reduce their environmental footprint in a cost-effective manner.

All projects start with the HSE Expectation: We create and maintain a Safe & Healthy work environment for our Team Members, our Clients, and our Engineering and Construction partners. And, we believe that it is our responsibility to deliver our mission in a manner that protects and enhances our environment now and in the future. Fusion's continuously improving HSE Systems result in an Experience Modification Rate consistent with the best in class in its industry.

This policy statement is issued to all Team Members at the commencement of their employment.

#### **Fusion's Health, Safety & Environmental Key Qualifications**

<u>Description</u>	<u>2014</u>	<u>2013</u>	<u>2012</u>
Workers Compensation (EMR) Experience Modification Rate	0.86	0.91	0.90
Number of Employees (Full Time Equivalents)	93	93	87
Number of Exposure Hours	125,000	125,734	121,353
Total OSHA Recordable Cases	0	0	1
Company Incidence Rate / Industry Incidence Rate	0.0 / 1.4	0.0 / 1.4	0.0 / 1.4
Number of Fatalities	0	0	0
Number of Citations	0	0	0
Total Amount of Fines Incurred	\$0	\$0	\$0

Fusion's HSE Program is designed to create a sustainable environment consistent with Fusion Principles and comply with evolving OSHA and Client requirements:

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>➤ Management Safety Policy Statement</li> <li>➤ Accident Investigation Policy</li> <li>➤ HSE Leadership Competency Assurance Process</li> <li>➤ Blood borne Pathogen Procedures</li> <li>➤ Defined HSE Responsibilities</li> <li>➤ Drug and Alcohol Policy</li> <li>➤ Electrical Safety Non-Qualified &amp; Qualified Program</li> <li>➤ Fall Protection Plan</li> <li>➤ Fire Fighting Plan</li> <li>➤ Hazard Communication Plan</li> <li>➤ Ladder Safety Policy</li> <li>➤ LockOut TagOut, Energy Isolation Policy</li> <li>➤ On-Site Firearm Policy</li> <li>➤ Personal Protective Equipment Policy</li> <li>➤ Scaffold Safety Policy</li> <li>➤ Annual HSE Review Program</li> </ul> | <ul style="list-style-type: none"> <li>➤ Annual Safety Goals</li> <li>➤ Asbestos Awareness Policy</li> <li>➤ Basic Noise Awareness Policy</li> <li>➤ Confined Space Program</li> <li>➤ Disciplinary Program</li> <li>➤ Ebola Awareness Policy</li> <li>➤ Employee First Aid</li> <li>➤ Fatigue Management Policy</li> <li>➤ Fork Truck Policy</li> <li>➤ House Keeping (In-Office)</li> <li>➤ Lifting Mobile Equipment Policy</li> <li>➤ On-Site Emergency Policy</li> <li>➤ Respiratory Protection Program</li> <li>➤ Short Service Employee Policy</li> <li>➤ Schedule Safety Meeting Policy</li> <li>➤ Subcontractor Annual HSE Systems Review</li> </ul> |
|--|--|

Fusion's HSE Program is integrated with its Engineering & Design services to enable its Clients to meet OSHA, EPA, and other Government regulations:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>➤ Process Safety Engineering &amp; Design</li> <li>➤ Electrical Safety Engineering &amp; Design</li> <li>➤ Combustion Safety Engineering &amp; Design</li> </ul> | <ul style="list-style-type: none"> <li>➤ Personnel Machine Access Design</li> <li>➤ Fugitive Dust Control Monitoring Studies</li> </ul> |
|---|---|

**Facility Engineering & Design Experience – Sample Projects**

**1. Energy Independence Study.** State of Wisconsin – University of Wisconsin – Green Bay

Completed an Energy Independence Study to quantify savings opportunities supply cost estimates for the implementation of the projects and to develop a plus or minus 35% estimate. The study resulted in identifying annual savings opportunities in excess of \$310,000. The savings included reductions in electrical and gas consumption and have an average payback of 8.9 years. Projects include facilities HVAC, Lighting, and Piping/Plumbing systems.



**2. Boiler Upgrade.** State of Wisconsin – University of Wisconsin – Oshkosh

Scope included the replacement of all components of the two 45,000 lbs./hour coal fired boilers that provide a primary source of steam heat to the entire campus header, including the blowdown system, bottom and surface blowdown valves, all piping and the flash tank, and the replacement of grates. The work included asbestos abatement of the cooling lines that protect the existing grates.

**3. Boiler Controls Upgrade.** State of Wisconsin – University of Wisconsin – Oshkosh

Provided A/E Design, Bidding Document Preparation and Construction Monitoring assistance for Boiler #4 at the campus.

- Replaced of the existing forced draft motor with a new 100Hp high efficiency motor.
- Performed a load audit on the existing MCC to determine its capacity for an additional 100Hp load.
- Installation of a 100Hp A-B PowerFlex-700 VFD into the existing emergency Power MCC.
- Added a flame scanner to the boiler into an existing port following an investigation whether the condition of the existing dampers and linkage may be the cause of the instability on the flame scanner signal at specific point(s) on the operating curve of the boiler.
- Performed combustion tuning and flame scanner alignment specifications.
- Determined whether the changes proposed in this project will impact NFPA code requirements



**4. Boiler Controls System Upgrade.** State of Wisconsin – University of Wisconsin – Stevens Point

Engineered the removal of the existing boiler and plant auxiliary controls that included panels, field devices, valves, and all associated piping, tubing and wiring for interconnection. Designed the installation of new central boiler panels, programmable logic controllers, field devices, valves, switches, gauges, piping, conduit, wire and tubing necessary for central control of plant operations. Developed the program design and system integration. Developed commissioning plans to confirm control operations under multiple working conditions and steam demand environments.



**5. Chiller Installation.** Confidential Client.

Upgraded the existing chilled water process, and to provide additional capacity by installing two (2) new chillers. The Units were located in a new enclosure located adjacent to the Utilities Building. The two 1400 ton units required process piping and process control engineering and design.



**6. Instrumentation/Controls System Upgrade.** Madison Gas & Electric, Madison, WI

Onsite Project Management and Controls Engineering Support. Assisted with day-to-day maintenance, executed small projects, and developed scope for larger project. The generation facility has pulverized coal and gas fired boilers with steam turbine generators. Duties included programming Matrix DCS Systems, Modicon PLCs and Wonderware HMIs.



**7. Airport Terminal Plumbing System Upgrade,** WI DOT

Provided design engineering to renovate and expanded the existing airport terminal building. The previous 2,734 SF terminal building was updated to meet current ADA standards and included finish material updates. There was a 2,106 square foot addition to meet space needs for the airport as well as provide space for a meeting room and training activities.



**8. Steam System SCADA.** Confidential Client

The Client supplies steam to numerous customers in the downtown of a major metropolitan area. Due to safety concerns, there was a need for addition monitoring and an upgrade to the obsolete RFL remote I/O units (RTUs). Additional safety options were evaluated for personnel tracking. Conducted a Cost & Feasibility study to identify options for a Communication System to monitor the Steam System operation and tunnel conditions.



**9. Environment Filtration System.** Confidential Client

Developed preliminary basket layout showing slopes, door sizes and swings, and basket size, incorporating feedback from the design review, optimize the preliminary design to maximize the structural integrity, the capacity for rejects, and balancing the other items in the design criteria.

- Reduction of solids missing basket
- Improving solids discharge
- Better access for cleaning and operation improvement



**10. HVAC Systems.** Numerous industrial and commercial projects

Projects included a large and unique office/locker room/exercise facility. Scope included pre-funding option/cost analysis and project construction cost estimates. Developed engineering estimate and managed associated design team. Performed heat loss and heat gain calculations. Selected equipment adhering to state codes and wrote equipment-purchasing documents. Issued construction packages for bidding.





## Facilities & Utilities Projects – Sample Projects (continued)

### 11. Storm and Sanitary Sewer System Controls Upgrade – City of Milwaukee

Upgraded the instrument control and data acquisition system (SCADA) for the City of Milwaukee, WI wastewater treatment system. This project designed and implemented the Human Machine Interface (HMI) screens for the City's existing SCADA system with a current controls technology and methodology. Scope included upgrading the 83 sewer system and bypass pump facilities that are used to prevent basement backups in extreme wet weather events, seven sanitary lift stations that pump sanitary sewage from low-lying areas to existing sewers, and two storm water lift stations

### 12. Power Generation Plant Compressed Air Upgrade – Confidential Client

Engineered the replacement of existing air compressors, dryers, and air receivers, to upgrade all plant compressed air to instrument quality service. Designed the piping runs and system tie ins to replace a majority of the existing air piping with new, stainless steel material. The project was designed, installed and commissioned while the plant remained operational.

### 13. Frazil Ice Study – Confidential Client

Performed an in depth analysis and study of a power generation plants fresh water intake system to determine if it was susceptible to blockage from a frazil ice phenomenon. This engineering study included taking water temperature samples over a period of time, analyzing the intake facility design, intake piping design and cold weather operating conditions. Result of the study was a recommendation to modify the intakes at minimal capital costs resulting in optimal conditions to prevent frazil ice buildup.

### 14. Clean Agent Fire Protection System Installations – Confidential Client

Engineered the replacement of existing wet sprinkler fire protection systems with NOVEC clean agent system, protecting essential control and computer systems for two power plant main control rooms. Introduced the client to the advantages of implementing clean agent fire protection systems to replace wet systems, thereby ensuring that crucial equipment would stay operational in case of a fire event.

### 15. Coal Transfer System – Confidential Client

Engineered a new coal transfer system for unloading coal silos during annual outage silo cleaning and repairs. The new system eliminated errant coal dust from migrating through the plant during the transfer to trucks and shortened the time to empty a silo from two days to less than ten hours. The system made use of the existing space and coal feeders by adding a movable transfer chute design and dust suppression system, thereby reducing the labor requirements of plant personnel taking part in the unloading process.

### 16. Rail Car Unloading, Dust Suppression Upgrades – Confidential Client

Performed an engineering study for reducing coal dust migration in a power plant rail car unloading facility. The study led to design recommendations and a project to upgrade the existing dust collector system, relocate dust collecting ductwork and install dust suppression equipment. The project reduced airborne coal dust to a level that provided a safer working environment and reduced the likelihood of an explosion. Facility after upgrades was cleaner, safer and easier to maintain.

### 17. Air Pre-Heater Upgrade – Confidential Client

Led the replacement of air heater baskets and seals, required for Air Preheater. Project consisted of replacing 1900 baskets and 80 bypass seals and sector plates. Baskets were deteriorated and at the end of expected life.

**18. Boiler Condenser Tube Upgrade – Confidential Client**

Managed the replacement of 13,337 condenser tubes with Sea Cure tubes. Sea Cure was purchased to withstand microbiological corrosion and bad water chemistry issue with dissimilar metals. The responsibilities consisted of planning, scheduling, coordinating and implementation of activities supporting the engineering project.

**19. Fly Ash Landfill Cell Closing – Confidential Client**

Project managed the closing and capping of a 2.4-acre landfill cell to allow fly ash to be stored. Responsibilities consisted of performing slope stability and drainage analysis to insure proper preparation for the final cover materials. Scope included providing soil samples analysis, permeability, compatibility and leach testing according to standards.

**20. Emissions Monitoring Solutions – Confidential Client**

Project managed the installation of carbon dioxide (CO) monitors/sample system to monitor CO levels on each silo for early fire detection. The responsibilities consisted of purchasing and installing new CO monitoring systems on pulverizers with modern equipment. The new technology detects rising CO levels in the silos, which indicate potential hotspots and/or smoldering coal. Project engineering for replacing new mercury monitoring and associated equipment technology. Pollutant monitoring system included analyzers for mercury, stack gas flow monitor, data logger, and sample line (umbilical) mercury. Also completed continuous emissions monitoring data acquisition and handling system.

**21. De-aerator Heater Replacement – Confidential Client**

Lead project manager for installing new de-aerator heater. Responsibilities included planning, specification development, budget pricing and identifying permits and vessel regulations. Vendor selection and calculations to verify improved performance was also part of deliverables.

**22. Turbine Conditioner Installation – Confidential Client**

Lead process engineer to install oil turbine conditioner. The oil conditioner pre-cleans and filters process oil used to lubricate the turbine oil reservoir. The project consisted of engineering a new platform and interfacing with the new PLC.

**23. Boiler Feed Water Replacement – Confidential Client**

Project managed the installation for new feed water heater replacement. Responsibilities included the design of new bundle assembly. Project also consisted of heavy rigging of removing the existing equipment.

**24. Environmental Control Equipment Replacement Solutions – Confidential Client**

Engineered the design and installation of a new hopper replacement. The pollution control equipment consisted of a complete system used to reduce the environmental impacts from operations, including installing dust catcher/collectors, storage silos and hoppers.

Evaluated the integrity of head gate channel and design repair/replacement for head gate channel. Responsibility also included acquiring a budgetary estimate for construction and installation of Penstock head gate for dewatering turbine.

**25. Power Plant Civil-Structural Analysis and Design – Confidential Client**

Conducted inspection and analysis Power Plant's Coal Handling Structures at the client's facility. Fusion's analysis resulted in identifying 25 high-risk conditions and developing immediate and long term plans to minimize the risk to equipment failure and personnel.