Power Generation
Full Service Design and Engineering
EAPC Industrial Services offers a full spectrum of services including consulting, engineering, construction, operation, maintenance, startup, and testing solutions provided through flexible work processes tailored to meet your specific needs.
EAPC INDUSTRIAL SERVICES
ENGINEERING FOR HEAVY INDUSTRY

EAPC Industrial Services is a multi-disciplinary consulting firm with offices in Grand Forks, Fargo, Bismarck, Minot, and Williston, ND; Sioux Falls, SD; Bemidji and St. Paul, MN; Fort Collins, CO; Phoenix, AZ; and Kansas City, MO.

The staff of EAPC has performed hundreds of power generation and process industry projects for a wide breadth of clients nationally.

HSE QUALIFICATIONS
EAPC is certified under ISNetworld (ISN# 400-217037)
NCMS NON-DOT Qualified

EAPC has 115 employees providing services in the following areas:
Engineering: Chemical, Combustion, Mechanical, Electrical, Structural Commissioning
Architecture
Procurement
Construction Management
Maintenance Planning
Forensics
Wind Energy Consulting
Business Excellence: LEAN Methodologies, Leadership Training
Our multidisciplinary teams include members who previously worked at operating plants, consulting organizations, and research centers with experience working around the world and close to home.

Our Industrial Services Group provides a full spectrum of services including consulting, engineering, training, construction management, operation, maintenance, startup, and testing solutions that support your organizational goals. We do this through flexible work processes tailored to meet your specific needs with a focus on developing and maintaining a long-term relationship with you.

Our experience spans a broad range of industries including Food Processing, Industrial, Process, Commercial, Institutional, and Governmental. We have completed countless projects in these industries including Sugar Processing, Ethanol, Bio-refining, Oil & Gas, Electric Power Generation, Agriculture & Food Processing, Minerals & Mining, Forest Products, and Manufacturing.

POWER GENERATION SOLUTIONS

The power generation industry is very complex. EAPC can provide the knowledge and experience to meet those requirements. Our team is made up of a strong mix of experienced, industry tested professionals who provide a consistent and technologically advanced approach to all projects.

We have the breadth and depth of experience needed for Power Station Owners seeking outside engineering service support. Although we have completed greenfield projects, our niche is retrofit projects. Our staff is experienced in engineering, procurement and construction support including engineers who have worked for operating companies at central power generating stations. We also have experience across a wide breadth of heavy industries from which we draw applicable experience to the power industry including: Oil & Gas, Minerals and Mining, Petroleum Processing, Agricultural Processing, Biofuels, and Institutional Central Boiler Plants

We have combustion, mechanical, electrical, environmental, structural, and chemical engineers within our organization to support all disciplines required for a project. Those areas where we don’t have specialized expertise, we have developed partnering relationships to provide the necessary services.

EAPC is a successful competitor based upon our ability as a smaller organization to provide responsive, high quality solutions through competent, experienced personnel at typically a lower cost. With multiple locations throughout the region, EAPC is able to meet your needs quickly and efficiently.

EXPERIENCE

Boiler Systems
Stack Additions/Replacements
Boiler MACT, ESP, CEMS, COMS Systems
Balance of Plant Systems
Combined Heat & Power
Buried and Elevated Steam Condensate Systems
ASME Section VIII New & Existing Vessel and API Tank Design/Analysis
ASME B31 Code Piping Engineering Design
API 650 Tank Design
Industrial HVAC
Chiller Systems
Water Treatment Systems
Mercury Capture
Fuel Oil to NG for Startups
Project Management
Construction Management
Energy Studies and Assessments

Code Studies
Electrical Area Classifications
Plant Outage Support
Startup Support
Maintenance Planning and Scheduling
Combustible Dust Explosion Protection/Prevention
Waste Water Treatment Systems
Material/Coal Handling Conveying
Unloading/Storage/Feeding Chutes/Transitions/Hoppers/ Grating Equipment Structures-Elevated Dust Control/Explosion Mitigation Buildings/Foundations/ Structures Civil/Roads
COMBUSTION ENGINEERING
HARNESSING ENERGY FROM FUEL THROUGH COMBUSTION PROCESSES AND SYSTEMS

Whether it is burner design, modification, or testing, burners are included in the many services we offer. Coal pulverizers, coal classifiers, crusher-driers, and coal conduits merit similar attention. Our Combustion Engineering work includes forensics, testing and design, usually for the purpose of either performance improvement or solving a problem. We specialize in combustion systems coordination for optimum performance.

SOLVING PROBLEMS IN POWER PLANT PERFORMANCE
Our combustion engineering sector focuses on helping utility owners and operators solve power plant performance problems. Historically our emphasis has been on controls, boilers, fuels, and a variety of combustion improvement and combustion forensic services.

DESIGN AND RETROFIT ENGINEERING ASSISTANCE
Our services include complete DCS and BMS replacements, new Low NOX Burners and Overfire Air Systems design, and SNCRs.

SERVICES
Combustion  Coal Test Burning
Boiler Services  Mill Inerting
Start-up Services  Performance Testing
Burner Management Systems  Technical Resource
Performance Monitoring

Performance Monitoring
MECHANICAL ENGINEERING
APPLYING ENGINEERING, PHYSICS, AND MATERIALS SCIENCE FOR YOUR MECHANICAL THERMAL AND FLUID SYSTEM NEEDS

Responsive personnel support projects from feasibility studies, design, procurement, construction, start-up and testing, and troubleshooting phases through maintenance planning support. With state-of-the-art technology software applications and informational resources to assist in problem solving and data analysis, we provide efficient, cost effective service to respond to your needs.

SERVICES AND DELIVERABLES

3D MODEL AND DRAWING PREPARATION
3D Laser Scanning and Documentation
Equipment Design
General Arrangement Drawings
Piping and Instrumentation Diagrams (P&IDs)
Process Flow Diagram (PFD)
Sheet Metal, Chutes, Transitions, Spouting
Vessel and Tank

SPECIFICATION PREPARATION
Equipment & Device Data Sheets
Equipment & Materials

INSPECTIONS
Ultra Sonic Thickness Testing

STUDIES
AACE Cost Estimate Studies
API
Basis of Design
Business Case Development
Codes – ASME Boiler & Pressure Vessel Code
Feasibility Studies
NFPA
Preliminary Engineering

ANALYSIS
Fluid Statics/Dynamics
Heat Transfer
Mechanics
Thermodynamics
APPLICATION EXPERIENCES
Above & Below Ground Tanks – API
ASME STS-2000 Stack Analysis & Design
Boiler & Chiller Systems
Cogeneration Systems
Combustible Dust/Dust Collection/Pollution Control
Cooling Towers
Dewatering Systems – Process/Centrifugal
Diesel Generator Systems
Dryers
Electrostatic Precipitators
Elevated Cranes
Evaporators
Explosion Protection and Suppression
Fire Protection
Filters
Heat Exchangers
HVAC – Commercial and Industrial
Material Handling
Belt
Screw
Drag
Pneumatic
Elevators
Storage
Vibratory Feeders
Conveyors
Reclaiming
Machine Design – Process Equipment
Pelletizing
Plumbing
Power Transmission – Hydraulic/Pneumatic
Pump Systems
Pressure Vessels – ASME, B&PV, Section VIII
Product Coolers
Sampling Systems
Services and Applications
Screening
Scrubbers
Size Classification
Tank Installations – API
Truck and Rail Loading and Unloading Systems
Underground Storage
Washing and Dewatering Systems
PIPING ENGINEERING
DESIGNING SAFE AND COST EFFECTIVE PIPING SYSTEMS

Our full spectrum of services ranges from plant expansions to equipment installations, pressure piping and pressure vessel analysis, code evaluations, and cost estimating. Because of our flexibility, we devote the same level of attention to client concerns for projects all sizes. Our flexibility allows us to assimilate into your organization with a minimal learning curve to maximize your project team’s resources. Let us help you reach your goals with any size industrial project.

SERVICES AND DELIVERABLES

3D MODEL AND DRAWING PREPARATION
- Piping & Instrumentation Diagrams (P&ID)
- Orthographic & Isometric Design/Layout
- Hanger, Anchor & Support Design/Layout
- Isometric & Spool Drawings
- 3D Laser Scanning and Documentation

SPECIFICATION PREPARATION
- Components and Materials
- International EN Piping Specification Development

STUDIES
- Codes – AMSE & API
- Capacity | Remaining Life

INSPECTIONS
- Infrared Leak Detection
- Ultrasonic Thickness Testing

ANALYSIS
- Fluid Statics/Dynamics
- Heat Transfer
- Piping-Stress/Flexibility

APPLICATION EXPERIENCES
- Buried Underground Piping
- Cathodic Protection
- Double Containment Systems
- Expansion Joints/Loops
- Heat Tracing
- High Energy Piping
- Network Systems
- Plant Retrofits
- Premanufactured Piping Systems
- Power Piping Systems
- Process Piping Systems
- Refrigeration Piping Systems
- Road & Bridge Crossings
- Tie-ins
- Utility Piping
- Steam & Condensate Distribution Systems
ELECTRICAL ENGINEERING

POWER DISTRIBUTION FOR ALL YOUR NEEDS

Our electrical engineers support projects from feasibility studies through design and procurement. We support any need you may have during construction and start-up/testing/troubleshooting. Using state-of-the-art technology software applications and informational resources, we provide efficient, cost effective service to respond to your needs.

SERVICES AND DELIVERABLES

DRAWING PREPARATION
- Feeder Riser Diagrams
- Grounding Plans
- Instrumentation Loop Diagrams
- Motor Connection Diagrams
- Motor with Control Schematic/Logic Diagrams
- System Layouts
- Switchboard & Motor Control Center Designs

SPECIFICATION PREPARATION
- Equipment Components & Materials
- Instrumentation & Equipment Data Sheets

STUDIES
- Arc Flash
- Area Classification
- Electrical Distribution
- Load Flow
- Utility Power Coordination

INSPECTIONS
- Commissioning
- IR Scanning
- Loop Checks

APPLICATION EXPERIENCES

- Cable Tray & Rack Systems
- Cogeneration Equipment
- Communication Networks
- Emergency Generation & UPS Systems
- Energy Conservation
- Electric Heating Systems
- Fire Alarm Systems
- Grounding & Bonding
- Ground Fault & Short Circuit Design
- Heat Tracing
- Lighting Controls
- Lightning Protection
- Power Monitoring & Controls
- Power Factor Correction
- Security Systems
- Sound & Paging
- Transient Voltage Suppression
- Industrial/Commercial/Site/Roadway Lighting

ANALYSIS

- Device Coordination
- Field Survey & Analysis
- Load Calculations
- Lighting Calculations
- Voltage Drop

APPLICATION EXPERIENCES

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- Industrial/Commercial/Site/Roadway Lighting
ENVIRONMENTAL ENGINEERING
MANAGEMENT, COMPLIANCE, AND AUDITING

SERVICES AND DELIVERABLES

ISO 14001 ENVIRONMENTAL MANAGEMENT SYSTEM
- Initial Review of Existing Management Program
- Gap Analysis
- Pre-Registration System Design and Implementation
  - Adapting Permit and Regulatory Requirements to ISO 14001
  - Review of Affected Sources and Processes
  - Identification of Documentation Requirements
  - Implementation of Documentation Control
  - Support in Writing Procedures
  - Training
- Pre-Registration Third Party Audit Support
- Registration Audit Support

AIR PERMITTING

Title V, New Source Review (NSR) permit renewals
- Bact Analysis for Major Permit Modifications
- Air Modeling
- Crudes, Intermediates, Asphalt, Gasoline, Fuels, Asphalt, and Chemical Product Terminals And Operations
- Natural Gas and Coal-Fired Power Electrical Generation Plants
- Oil and Gas Field Permitting
- Emissions Inventories
- Annual Compliance Certification Preparation
- Implementation of Compliance for Subpart BBBBBB NESHAP for Gasoline Distribution Bulk Terminals
WATER
NPDES Permitting
Spill Prevention, Control, and Countermeasures (SPCC) Plans and Training
Storm Water Pollution Prevention Plans (SWPPP) and Training

CHEMICAL USE AND RCRA MANAGEMENT
Records gathering and Electronic Submittal for the Toxic Release Inventory
Hazardous Waste Management
  Waste Classification Review
  Review of Regulatory Compliance with RCRA
  Design of Tracking Systems for Handling of Containers in Satellite Accumulation Areas
  Labeling and Manifesting
  Manifest Tracking
  Monthly Waste Count
  Annual or Biennial Hazardous Waste Reporting
  SARA Tier II Record Keeping and Electronic Report Submittal
CHEMICAL ENGINEERING

DESIGN FOR THE PRODUCTION, TRANSFORMATION, TRANSPORTATION, AND PROPER USE OF CHEMICALS, MATERIALS, AND ENERGY

Our Chemical Engineering Group provides process engineering capabilities over a wide range of industries – gas plants, oil refineries, chemical and manufacturing plants, water and wastewater treatment, pollution control, steam and power generation, sugar processing, food industries, and more.

We work with our clients in all phases of project development and provide a full range of engineering services, including: Conceptual engineering, Basic engineering and design, Detailed engineering and design, Procurement, Fabrication, Commissioning and start-up.

We help clients on equipment sizing and specifications, safety concerns, evaluation of alternatives, infrastructure requirements, and modifications of existing facilities to develop engineering solutions that are clear, concise, and appropriate.

SERVICES AND DELIVERABLES

PROCESS MODELS
- Mass, Heat, Energy Balance
- Process Design Criteria Development
- Process Functional Description

PREP, DESIGN, AND MANAGEMENT
- Process Design and Flow Diagram Preparation
- Piping and Instrumentation Diagram Preparation
- Process Equipment Specification Preparation
- Process Safety Management

STUDIES
- Process Modifications
- Expansions
- Efficiency Improvements
- Financial Returns/Models

TROUBLE SHOOTING
- Unit Operation and Plant Troubleshooting
- Operational Analysis and Recommendations
- Start-up Assistance

APPLICATION EXPERIENCE

Autoclaves
Boiler
Centrifuges
Chillers
Classifiers
Clarification
Condensate Systems
Cooling Water System
Crystallization
Chromatography
Decolorization
Diffusion
Distillation
Dryers
Fermentation
Filtration
Fire Water and Protection System
Flare System
Ion Exchange
Instrument Air System
Scrubbers
Steam Distribution
Vacuum System
Water Treatment
Wastewater Treatment
STRUCTURAL/ARCHITECTURAL ENGINEERING & DESIGN
SPECIALIZING IN THE ANALYSIS AND DESIGN OF FOUNDATIONS AND STRUCTURES

Physical laws and empirical data allow us to understand, predict, and calculate the stability, strength, and rigidity of structures as well as to design, construct, and maintain the built environment.

Using the latest in engineering software, our structural team members can analyze existing as well as design new structures, foundations, and plant facilities/infrastructure. For projects needing architectural work, our staff includes professional architects certified in numerous jurisdictions. Whether it is a plant expansion or a greenfield site, our multidisciplinary team can handle your project from start to finish.

Our structural team takes pride in striving to understand each client’s individual goals and objectives as well as the needs of the project. We work with you to provide options to find a solution that works best for you. We have the tools, the experience, and the knowledge to provide safe, efficient, cost effective, buildable structures that perform as intended.

SERVICES AND DELIVERABLES
DRAWING PREPARATION
Architectural Plans Elevations
Construction Detailing
Site Layout/Topography
Structural Plans/Sections

SPECIFICATION PREPARATION
Architectural
Structural

STUDIES
Code
Feasibility/Cost
Forensic
Structural

ANALYSIS/DESIGN
Dynamic/Vibration
Steel, Concrete (Cast-In-Place and Precast), Masonry, Wood, Aluminum Materials
Structural Components (Roofs, Walls, Floors, etc.)
Steel Connections
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PROJECT MANAGEMENT

SINGLE-POINT OF CONTACT TO INCREASE YOUR OPTIONS FROM PLANNING THROUGH START-UP

Factors such as plant shutdown dates, equipment delivery, regulatory deadlines, and construction scheduling all affect your budget and completion dates. EAPC will assist you in selecting the most appropriate project delivery method based on our experience with design-bid-build with professional construction management and procurement support or single point design-build services. With this array of options, our clients select the project delivery approach that will result in the most successful project experience through all phases of engineering, procurement, and construction.

SERVICES

ENGINEERING
Constructability, Operability, Maintainability Analysis
Economic Analysis
Value Engineering
Cost Estimating and Budget Development
Budget Control and Reporting
Execution Planning, Resource Management and Project Scheduling
Contract and Bid/Construction Document Development
Contractor Prequalification

PROCUREMENT
Procurement Plan Development, Management and Reporting
Supplier Prequalification
Bid Specification Development
Contract Terms and Conditions Development
Request For Quotation Development and Issuance
Bid Process Management
Bid Receiving and Analysis
Purchase Award Recommendation
Spare Parts Definition
Monitoring Supplier Engineering, Shop Drawing Development, Fabrication and Shipping
Inspection Support to Verify Contract Compliance and Quality Requirements
Expediting Plan Development, Monitoring and Reporting
Receiving Coordination

CONSTRUCTION
Pre-Construction Planning
Safety Coordination
Site Facilities Planning
Contracting Strategy Development
Cost Management, Monitoring and Reporting
Construction Schedule Development, Management and Reporting
Construction Sequence and Logistics Development
Field Contract Administration and Document Control
Contractor Coordination Meetings
On Site Technical Support
Startup and Commissioning, Operating Procedure Development and Staff Augmentation
3D AERIAL & GROUND-BASED LASER SCANNING
ACCURATE AND PRECISE SITE DOCUMENTATION

We use scanning primarily to increase the accuracy and reduce manpower required to create as-built conditions for retrofits to facilities. A scan can be converted to a working 3D model which designers can use as a starting point for modifications to the facility.

EAPC has also partnered with SkySkopes to offer our clients 3D Aerial Scanning services. SkySkopes utilizes a state-of-the-art LiDAR system, providing customers with cm-level accuracy for their surveying needs. Integrated with the LiDAR unit is a 24 MP camera, allowing simultaneous capture of still imagery for easy asset identification.

3D GROUND-BASED LASER SCANNING

EAPC’s ground-based scanner is a LiDAR system that quickly and very accurately creates a 3D model of its surroundings. On the job site, we are capable of running multiple scans and using software in our office to join the scans together and create one large 3D model, referred to as a point cloud. We then use the point cloud as a template in AutoCAD to draw solid objects to design around.

Scanning allows us to achieve greater accuracy in our field measurements because it removes the human error inherent in pulling a tape measure. This allows us to more accurately design a project and keeps change orders to a minimum.

It is also much faster than using traditional measuring methods, which saves us and our clients time and money.
PROFESSIONAL DRONE SERVICES

Through a partnership with SkySkopes, we are able to offer our clients 3D aerial scanning services. SkySkopes utilizes a state-of-the-art LiDAR system, providing customers with cm-level accuracy for their surveying needs. Integrated with the LiDAR unit is a 24 MP camera, allowing simultaneous capture of still imagery for easy asset identification.

LiDAR SERVICES
- Mapping/Surveying
- 3D Modeling
- Right of Way/Encroachment Surveys
- Terrain Models

OPTICAL GAS IMAGING INSPECTIONS
- Detect fugitive gas leaks
- Dual HD video and OGI for comprehensive inspections
- Collect radiometric temperature data in 640×512 resolution
- Superior detection of 20 different HydroCarbon gases

THERMAL INSPECTIONS
- Capture Detailed Temperature Data
- Dual HD and Thermal Images for Comprehensive Inspections
- Collect Radiometric Temperature Data in 640×512 Resolution
- Cover an Entire Building in a Fraction of time Compared to Handheld
PROGRAM OFFERINGS

LNG CONVERSION
Liquefied Natural Gas Conversion Systems for Plant Startup and Shutdown and Natural Gas Curtailment at CT Stations

HEP INSPECTION
High Energy Piping Inspection Program for Power Generation and Process Industries

LOW LOAD OPERATION OPTIMIZATION
Assisting power generation plants in achieving the lowest load possible, to reduce revenue losses during periods of low power demand and pricing.

LLOO also includes Ramp Rate Improvement, Short-term Shutdown and Startup Program Development, Auxiliary Power/Station Service Reduction, SOP Development/Revision.
The power generation industry is experiencing a massive turnover in staff due to attrition and with this turnover, many plants are losing decades of experience. In addition, many are downsizing their staff. With limited resources and time, project support and training can become very challenging.

**ON-SITE ENGINEERING AND SUPPORT SERVICES**

EAPC provides on-site engineering and support services to power generation clients. Our team can provide engineers to supplement existing staff for capital projects, plant outages, and project backlog. Our staff will be an extension of your team and provide the services you require. We provide the necessary flexibility to meet your schedule and can provide a combination of on-site and off-site services.

**SERVICES**
- Engineering Staff Support
- Capital Projects
- Outage Management/Support
- End of Year Project Closeout
- Planning and Scheduling
- P&ID Red-Lining and Drawing Updates

**TRAINING SERVICES**

EAPC’s Industrial Services staff comes from a diverse background with many of our team members having several years of direct power generation industry experience. Our knowledge and experience allow us to provide training to plant engineering, operations, and management teams. Although we specialize in some areas of training, we can develop a customized training program based on your specific requirements.

EAPC’s on-site training program offers an affordable, time effective method of providing hands-on training to power generation professionals.

**TRAINING PROGRAMS**
- Combustion Optimization
- NFPA
- Project Management
- Standard Operations Procedure “SOP” Development
- Standard Maintenance Procedure “SMP” Development
- Business Excellence “LEAN”