Our Vision

We strive to support the commercial success of our clients by providing superior technical services and problem-solving capabilities covering all materials-related issues in as timely and cost-effective manner as possible.

Over 300 years experience in the industry

Office: 423-267-0647

ATC-CES.com

ATC-CES: A Multi-Faceted Technology Company
Chattanooga, TN, USA
ATC-CES PROJECT MANAGEMENT

Small minority owned business offering a broad range of engineering services

Patented surface coatings and heat treating services

ISO 9001 Certified

Industry experts in metallurgy, failure analysis, and advanced materials

Metallurgical lab testing and research (Grade 91 material development with ORNL)

Combustion Engineering Solutions, experts in Boiler and HRSG design, retrofit, and material supply

Project Management
Who is ATC-CES?

ATC-CES is a diversified technology company that provides a range of services for US industries.

**Coatings Division** offers a variety of coatings solutions for difficult wear and corrosion problems.

**Heat Treatment Division** offers heat treatment services covering a range of materials, specializing in advanced engineering alloys, like Grade 91, that require very precise control of temperature.

**Combustion Engineering Solutions Division**, which includes its full-service metallurgical laboratory, provides basic and advanced engineering assistance for all materials and welding related issues, along with mechanical/structural design, analysis, and material supply for the boiler/HRSG industry.
Coating Division

- **Diffusion**
  - Chromizing
  - Aluminizing
  - Boronizing
  - Siliconizing

- **Thermal Spray**
  - Electric-Arc
  - Combustion/Powder

- **Plasma Transfer Arc**
  - Wear Resistance
  - Corrosion Resistance

*ATC – CES*
Heat Treatment Division

• Heat-Treatment Services
  – Annealing/Normalizing
  – Tempering
  – Quench and Temper
  – Stress Relief
  – Post Weld Heat Treatment
  – Solution Annealing
  – Precipitation Hardening
Heat Treatment Division

Flame Hardening Service
Combustion Engineering Solutions Division

- Materials Qualification
  - Chemical Analysis
  - Mechanical Testing
    - Tensile Testing
    - Charpy V-Notch Testing
  - Weld Qualification Testing
    - Bend Testing
    - Metallography/Hardness Testing
  - Macrostructural and Microstructural Analysis
Combustion Engineering Solutions Division

- Assistance with Materials-Related Issues
  - Extensive experience with “difficult” materials, such as CSEF steels (e.g., Grade 91), advanced austenitics (e.g., TP310HCbN) and nickel-base alloys
  - Guidance on:
    - Material selection
    - Quality oversight throughout processing
    - Control of heat treatment
    - Condition assessment
    - Fitness For Service Evaluations
Combustion Engineering Solutions Division

- Component Qualification
  - NDE
  - Hardness Testing
  - Microstructure Examination
  - Charpy V-Notch Testing

<table>
<thead>
<tr>
<th>Sample</th>
<th>Location</th>
<th>Values</th>
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<tbody>
<tr>
<td>Right Side</td>
<td>Top Corner</td>
<td>486 (48)</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>486 (48)</td>
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<tr>
<td></td>
<td>Bottom</td>
<td>466 (47)</td>
</tr>
<tr>
<td>Bottom of Keyway</td>
<td>Center</td>
<td>465 (46)</td>
</tr>
<tr>
<td></td>
<td>Top Corner</td>
<td>493 (49)</td>
</tr>
<tr>
<td></td>
<td>Middle</td>
<td>407 (49)</td>
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<tr>
<td></td>
<td>Bottom</td>
<td>472 (47)</td>
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</table>

<table>
<thead>
<tr>
<th>Keyways</th>
<th>Flame Hardening Parameters</th>
<th>Tube Length (in)</th>
<th>Keyway Width (in)</th>
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<tr>
<td></td>
<td>Nozzle to Keyway (in)</td>
<td>Travel Speed (in/min.)</td>
<td>Fuel Flow (SCFH)</td>
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<tr>
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Combustion Engineering Solutions Division

• Failure Analysis and Root Cause Investigation
  – Damage Mechanism Determination
  – Verification of Specification Compliance
  – Root Cause Analysis
  – Litigation support
Combustion Engineering Solutions Division

• Field Inspection Support
  – Standard NDE
  – Metallographic Replication
  – Hardness Testing
Combustion Engineering Solutions Division

- Welding Engineering and Technology
  - Welding metallurgy
  - Weld Procedure Development
  - Weld Qualification Testing
  - Weld cracking behavior
  - Weld repair
Metallurgical Consulting, Litigation Support, Training (Metallurgy, Welding Engineering, NDE, Heat Treatment), Engineering Project Management, Assistance with Codes and Standards
ATC’s Combustion Engineering Solutions Division

Boiler and HRSG Design/Structural Group

• 300+: Combined Years of Boiler Service Engineering Practice
• Extensive Design Experience with Boiler/HRSG Equipment from Combustion Engineering/Alstom, ABB-CE Services, Foster-Wheeler, B&W
• 10: States in which Our Professional Engineers Are Licensed
• Located in Chattanooga, TN USA
ATC’s Combustion Engineering Solutions Division

Analysis, Design, and Material Capabilities

- High Energy Piping
- Pressure Part Components (SH, RH, Econ, Harps, Headers)
- Structural Support and Platforms
- Boiler Framing (Buckstay)
- Duct, Toggle Sections, Expansion Joints
- Construction Engineering
- Drafting Services
ATC’s Combustion Engineering Solutions Division

ASME B31.1 Power Piping
ASME B31.3 Process Piping
Condition Assessment
Pipe Support Repair
Drain Piping
Pressure Relief Vent Piping
Soot Blower Piping
ATC’s Combustion Engineering Solutions Division

Structural Analysis, Design & Material

Main Boiler/HRSG Support Steel
Press Part Support Steel
Platform Steel
Boiler Building Wind/Seismic Resisting Structure
Duct Support Steel
Pipe Support Steel
Boiler/HRSG Framing Analysis, Design & Material

- Buckstay Systems
- Lower Tube & Drum Supports
- Nose Arch Framing
- Lower Enclosure Framing
- Penthouse Enclosure Framing
- Casing Design
- Boiler/HRSG Guides
Duct Analysis & Design

- Air Ducts
- Gas Ducts
- Toggle Sections
- Expansion Joints
- Hoppers
- New Duct Routing
- Fabric Joint Specifications
ATC’s Combustion Engineering Solutions Division

Construction Engineering

Temporary Support Designs for Replacement:

• Waterwall Panels
• Lower Slope Panels
• Rear Arch Panels
• Headers
• Piping
ATC’s Combustion Engineering Solutions Division

Drafting Services

Pipe Arrangements
Pressure Part Arrangements
Steel Arrangements
Duct Arrangements
New Boiler Equipment Layout
Construction Sequencing