South Boston Overview, October, 2009

ABB Small Power Transformers
South Boston, VA
South Boston, Virginia

- Small Power Transformers
  - Built 1968, expanded 2008
  - 550,000 sq ft
  - 500 employees
  - 112.5 KVA – 112 MVA
  - 171 kV max
South Boston, VA – 89,000 Sq. Ft. added in 2008 to produce units up to 112 MVA units and eventually 230 kVA.
### ABB - who we are and what we stand for

<table>
<thead>
<tr>
<th><strong>Mission</strong></th>
<th>We help our customers use electrical power effectively and increase industrial productivity in a sustainable way.</th>
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<tr>
<td><strong>Vision</strong></td>
<td>By 2009, ABB will be recognized as the top global engineering company in terms of marketing impact, growth and profitability, value creation, sustainability and ethical behavior.</td>
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<td><strong>Business principles</strong></td>
<td>Responsibility - Respect - Determination</td>
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<td><strong>Brand pillars</strong></td>
<td>Leading-edge technology, pioneering spirit, at home everywhere</td>
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<td><strong>Communications messages</strong></td>
<td>Communication theme, always linked to concrete market offerings - Grid reliability and availability of power - Industrial productivity - Energy efficiencies.</td>
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<td><strong>Slogan</strong></td>
<td>Power and productivity for a better world</td>
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South Boston Overview

- **Transformer Products**
  - Power Substations
  - Unit Substations
    - Primary
    - Secondary
  - Networks
  - Padmounts

- **Transformer Services**
  - Off loading and Inspection
  - Installation, Testing, and Commissioning
  - Turnkey Retrofilling

- **Transformer Fluids**
  - Oil
  - BIOTEMP®
  - Silicone
South Boston’s Largest Transformer
Facility: Clean, Bright, Efficient!

- 5S keeps workstations neat, safe
Winding Combinations

- Layer/Layer
- Strap/Layer
- Layer/Disc
- Disc/Disc

Conductor Choices

- Copper
- Aluminum
Winding

LV Winding Machine

- All secondary windings are sheet-style
- Coil bars and leads are added during winding

Completed Coil
Winding

Semi Automatic Winding Machine

- High-quality, consistent, accurate, predictable windings
- Winding specifications and information downloaded directly from engineering design
Insulation Choices

- Classic paper insulation
- Diamond-patterned epoxy on paper
- Used in all transformers

- Used only for strap winding
- Electrostatically powder coated
- Cured in induction furnace
- Tough, scratch-resistant, flexible
Core Cutting

- Cores are made from grain-oriented silicon steel
- Using grain-oriented steel improves magnetic flux
South Boston, VA

Core Stacking Station
Core & Coil Assembly
Core & Coil Assembly

- Steel frame is welded around core
- Frame adds strength
- Protects shape of rectangular coils
South Boston, VA – Expansion

Cleat & Lead Assembly
Tanking

Our unique MICAFIL process:

- Coils are energized during tanking
- Heating draws moisture from Insuldur
- Vacuum pulls out moist air
The Fluids

- **Mineral Oil**
  - Primarily for outdoor applications
  - Approved for UL Listed transformers

- **Less Flammable Fluids**
  (UL & FM Approved for Indoor Applications)
  - **BIOTEMP®**
    - Vegetable based seed oil
    - 97% biodegradable within 21 days
  - **Silicone Fluid**
Why Liquid-Filled Transformers?

- Lower Initial Costs $
- Low Noise Levels
- High Efficiency
- Custom Design
- Factory Mutual Listing
- UL Listing
- Sealed Tank
- Low Maintenance
South Boston, VA

HV Test Lab: “Safety, Security, Compliance”

- Entry by security card magnetic door lock
- Warning lights and emergency trip-out circuits
- Dual Bay for safety and capacity
- Capability to test to meet all IEEE Standards and Customer Requirements
South Boston, VA - Expansion

HV Test Lab

Testing can be performed in one of two test bays to perform:

a) Preliminary Tests
b) Power Tests
c) Dielectric Tests

Customers have the option to witness on-site or on-line
SPT - Field Services

- Transformer Field Installations
  - ABB / Kuhlman Transformers
  - OEM Transformers

- Field Maintenance and Repair
  - Minor & Complete Re-gasketing
  - Transformer Coil Re-clamping
  - Existing Transformer Relocation
  - Electrical Controls Maintenance/Repair
  - Load Tap Changer Maintenance/Repair
  - No Load Tap Changer Maintenance/Repair
  - Substation Equipment Painting

- Inspection & Condition Assessment
  - Internal Inspection & Condition Assessment
  - Problem & Failure Investigation

- Oil Handling
  - Oil Sampling, Testing & Analysis
  - Oil Filtering & Vacuum Oil Filling (Through EHV Levels)
  - Oil Reclamation (With Fuller’s Earth) & Oxidation Inhibitor Addition
  - Vacuum Dehydration, Degassing & Hot Oil Dryout & Cold Trap Dryout

- Electrical Testing
  - Acceptance and Diagnostic Testing
  - Doble, Meggar, Turns Ratio, etc.
ABB is committed to enriching the workplace, preserving and protecting the environment, and strengthening the communities where we operate.
Manufacturing Operations

- ABB has joined the Green Supplier Network https://www.greensuppliers.gov/gsn/home.gsn.
- Leading Midwestern and Western Utilities are sponsoring ABB and our subsidiary Kuhlman Electric Corporation.
- ABB and Kuhlman will learn to couple our lean manufacturing techniques with sound environmental strategies, the *Lean and Clean Advantage*.
- The Training / Audit will allow ABB and Kuhlman to stay competitive and help us reduce our environmental footprint at the same time.

South Boston, ABB = $3M spend for improved safety & environmental processes in ‘09