Burner Management Systems & Methane Capture

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Presented by: SureFire

Technology Provider For: NaturalGas

Burner Management Systems (BMS)

“Provide an automatic method for controlling oil and gas process burners that improves safety, reduces emissions, and increases revenue.”
What a BMS Can Do

- Manages gas fired burners on process equipment
- Automatically lights burner
- Manages safety shutdowns
- Automatically manages burner fuel train
- Monitors temperature & process safety
- Provides real-time run status
- Integrates to PLC / RTU units onsite

Applications

- Incinerators or Combustors
- Separators, Dehydrators, or Heaters
- Most Naturally Aspirated Industrial Burners to Ten Million Btu/hr
- Industry-Specific Equipment
1. Pilot burning
2. T-12 calls for heat
3. Instrument gas flows, opens main burner valves
4. Process gets warm, T-12 shuts off main
But……If pilot is lost

Main AND pilot gas will vent until manually shut off.

**Burner Without BMS with pilot lost**

Main AND pilot gas will vent until manually shut off.

1. Pilot out
2. T-12 calls for heat
3. Instrument gas flows, opens main burner valves
Economic Benefits of BMS

- Reduce methane vented during upsets
- Eliminate standing pilot fuel use
- Increase process efficiency
- Optimize lease operator time
- Eliminate third party re-lighting
- Reduce carbon tax exposure
- Verify run status for permitted sites
- Increase production & increase revenue
BMS Economics: MCF & $$$

Simple Example:
• Burner Flame Out ( # Days x mcfd x # Burners)
• Standing Pilot ( # Days x mcfd x # Burners)
• Contracted Re-lights ( # x $75 x # Burners)
• Burner Down Production Loss ( mcfd x # Days)

Estimated Payout for BMS implementation varies with Application and Gas Price

MCF/Cost/CO2E Data @ $4.00/mcf

Methane *Vented* per Burner When Pilot Flame is Out

<table>
<thead>
<tr>
<th>Burner Size (btu/hr rating)</th>
<th>CFH @14 psi</th>
<th>Orifice Size</th>
<th>Main MCF/D</th>
<th>Pilot MCF/D*</th>
<th>Sum Daily Fuel Savings</th>
<th>Days Pilot is out</th>
<th>Yearly Savings</th>
<th>Yearly CO2 Equivalent (lbs)</th>
<th>Yearly CO2 Equivalent (US Ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250,000</td>
<td>357</td>
<td>7/64&quot;</td>
<td>0.357</td>
<td>8.568</td>
<td>1.68</td>
<td>3</td>
<td>$122.98</td>
<td>11,498.02</td>
<td>5.75</td>
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<td>500,000</td>
<td>730</td>
<td>5/32&quot;</td>
<td>0.73</td>
<td>17.52</td>
<td>1.68</td>
<td>0</td>
<td>$0.00</td>
<td>0.00</td>
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<tr>
<td>1,000,000</td>
<td>1,429</td>
<td>7/32&quot;</td>
<td>1.429</td>
<td>34.296</td>
<td>1.68</td>
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<tr>
<td>2,000,000</td>
<td>2,815</td>
<td>5/16&quot;</td>
<td>2.815</td>
<td>69.34</td>
<td>1.68</td>
<td>0</td>
<td>$0.00</td>
<td>0.00</td>
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</tbody>
</table>
### Annualized Example:

250,000 Btu Process Unit @ $4.00/mcf
Each Burner Pilot Goes Out 3 Times / Year
No Burner Management System

<table>
<thead>
<tr>
<th># Burners</th>
<th>Blowout/Vented Gas – MCF &amp; Cost</th>
<th>Pilot @ 5 Month Operation – MCF &amp; Cost</th>
<th>Total – MCF &amp; $55</th>
<th>Manual Relight @ $75 per Relight</th>
<th>Total $55</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30.74 mcf / $122</td>
<td>252 mcf / $1,008</td>
<td>282.74 mcf / $1,130</td>
<td>$75 x 3 = $225</td>
<td>$1,355</td>
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<tr>
<td>5</td>
<td>153 mcf / $614</td>
<td>1,260 mcf / $5,040</td>
<td>1,413 mcf / $5,654</td>
<td>$75 x 15 = $1,125</td>
<td>$6,779</td>
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<tr>
<td>10</td>
<td>304 mcf / $1,230</td>
<td>252 mcf / $10,080</td>
<td>282.4 mcf / $11,296</td>
<td>$75 x 30 = $2,250</td>
<td>$13,546</td>
</tr>
<tr>
<td>100</td>
<td>3,074 mcf / $122,296</td>
<td>252,000 mcf / $10,080</td>
<td>282,740 mcf / $113,960</td>
<td>$75 x 300 = $22,500</td>
<td>$135,596</td>
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<tr>
<td>1,000</td>
<td>30,740 mcf / $1,222,296</td>
<td>2,520,000 mcf / $100,800</td>
<td>2,827,400 mcf / $1,130,960</td>
<td>$75 x 3000 = $225,000</td>
<td>$1,355,960</td>
</tr>
</tbody>
</table>

### Benefits: Safety

- Take the torch out of your workers’ hands
- Shut down and safely re-light with a button
- Simplified operational procedures / reduced reliance on gas detection equipment
- Fault detection and fail-safe architecture
- Control venting of raw gas on site
- Centralize control of ignition sources
**Benefits: Environmental**

- Reduce methane venting during burner upsets
- Reduce combustion emissions
- Increased efficiency = reduced emissions
- Verify operating history at permitted locations
- GHG management / reduce carbon footprint

**SUMMARY:**
**Burner Management Systems**

- Improve safety
- Reduces burner related methane venting
- Decreases combustion emissions
- Increases gas sales
- Increases efficiency
- Lowers cost
Work Safer
Reduce Emissions
Lower Costs

www.Surefire-Controls.com