Black Start
Minimum Tank Suction Level

Market Implementation Committee

Joseph Bowring
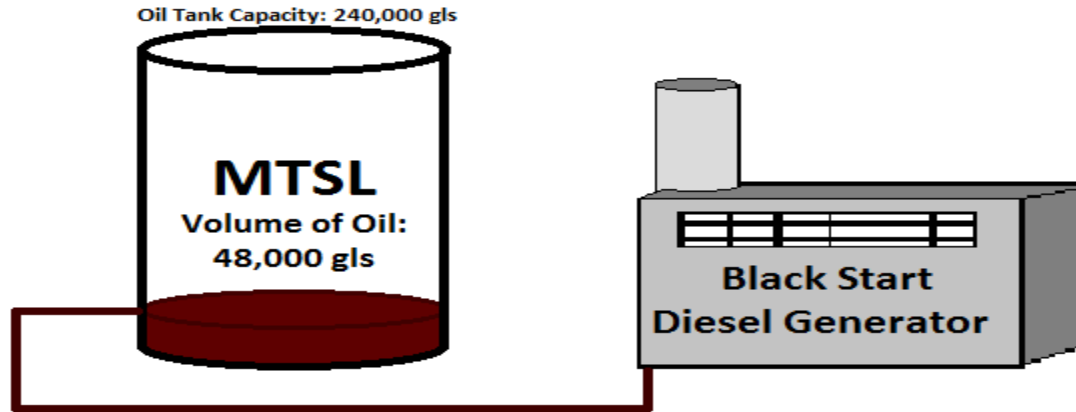
Gerard Cerchio

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Minimum Tank Suction Level - Stand Alone

- **Some units that participate in the PJM energy market have oil tanks.**

- **All oil tanks at PJM units have minimum tank suction levels regardless of whether they are black start. (Unless they use direct current pumps.)**

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Minimum Tank Suction Level - Black Start Only

Oil Tank Capacity: 240,000 gls

MTSL
Volume of Oil:
48,000 gls

Black Start Diesel Generator

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Minimum Tank Suction Level Example - Black Start Only

- **Black Start MTSL = MTSL**
  - **Where:**
  - **Black Start Tank Ratio = 100 Percent**

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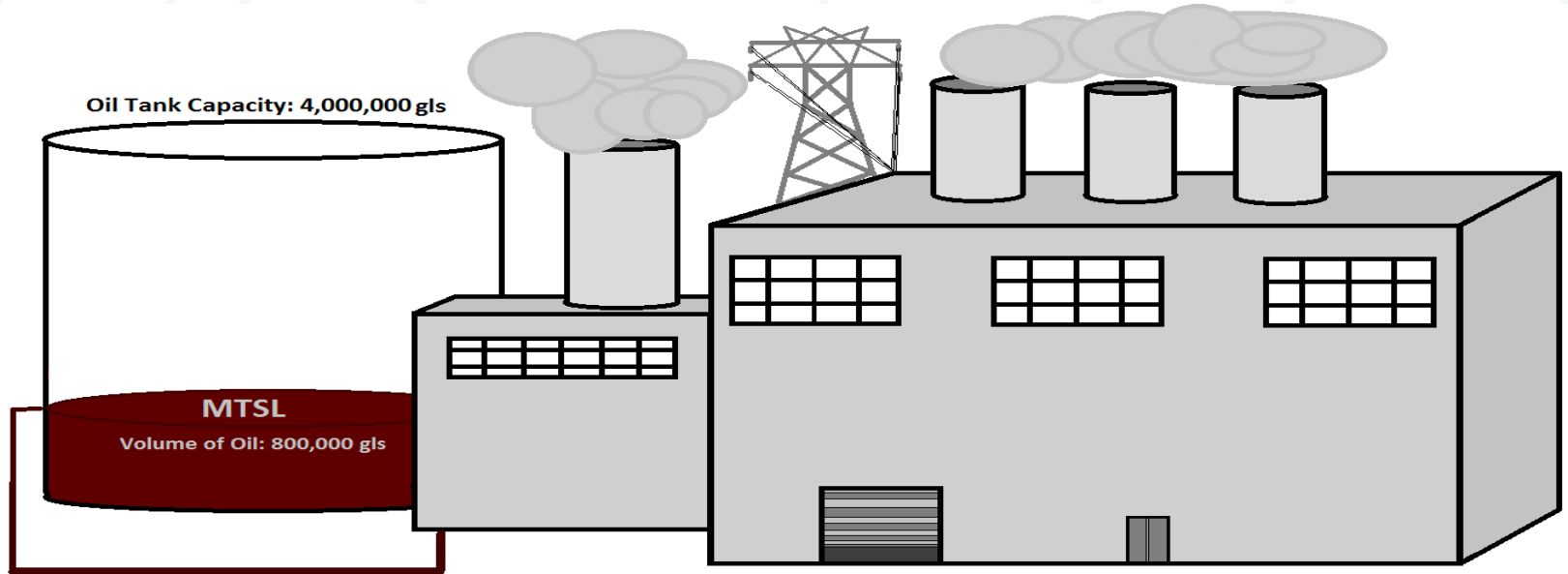# Minimum Tank Suction Level Example - Black Start Only

- **Example:**
  - **Tank Capacity: 240,000 gals**
  - **MTSL: 48,000 gals**
  - **Unit Fuel Burn Rate: 12,000 gals per hour**
  - **Minimum Run Hours: 16 hours**
  - **Total Black Start Fuel Burn: 192,000 gals**
  - **Black Start Tank Ratio = 100 %**
  - **Black Start MTSL = 48,000 gals**
  - **Tank Capacity = Fuel Burn + MTSL**
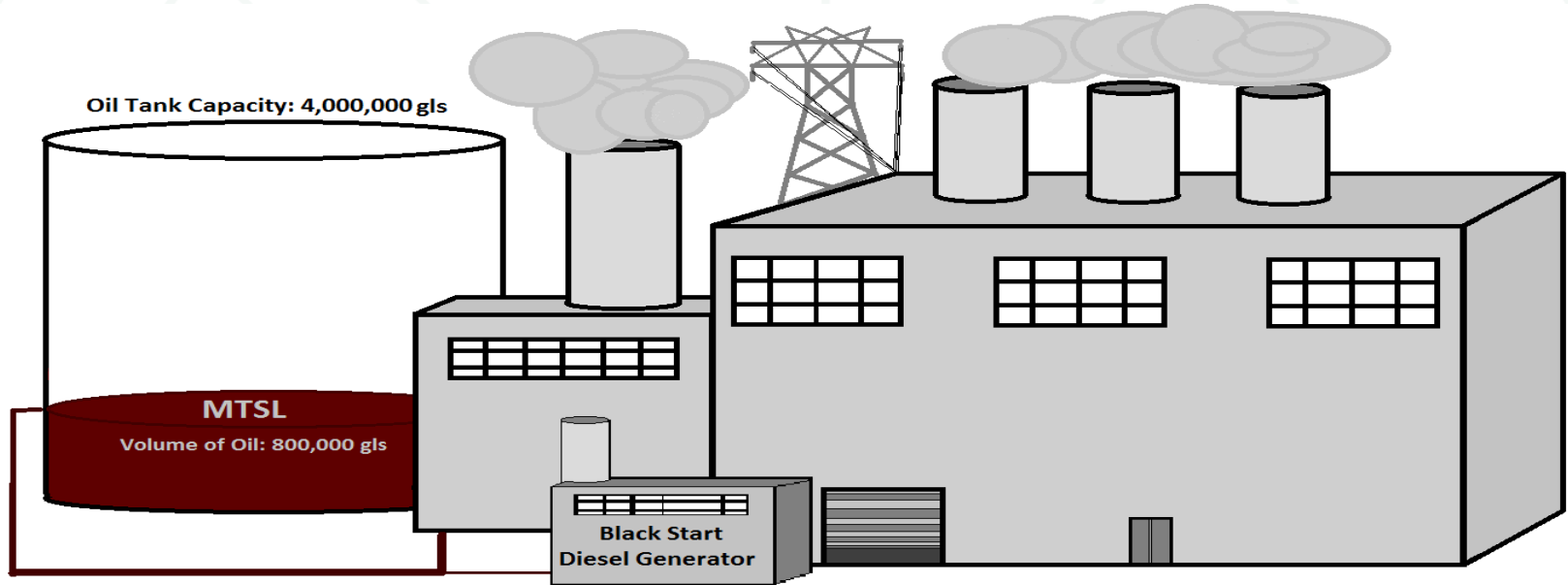
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Minimum Tank Suction Level - Shared

- **Many Black Start units use fuel tanks that are shared with other units that participate in the PJM energy market.**

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Minimum Tank Suction Level - Before Black Start

Oil Tank Capacity: 4,000,000 gls

MTSL

Volume of Oil: 800,000 gls

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Minimum Tank Suction Level - Shared

Oil Tank Capacity: 4,000,000 gls

MTSL

Volume of Oil: 800,000 gls

Black Start Diesel Generator

Monitoring Analytics

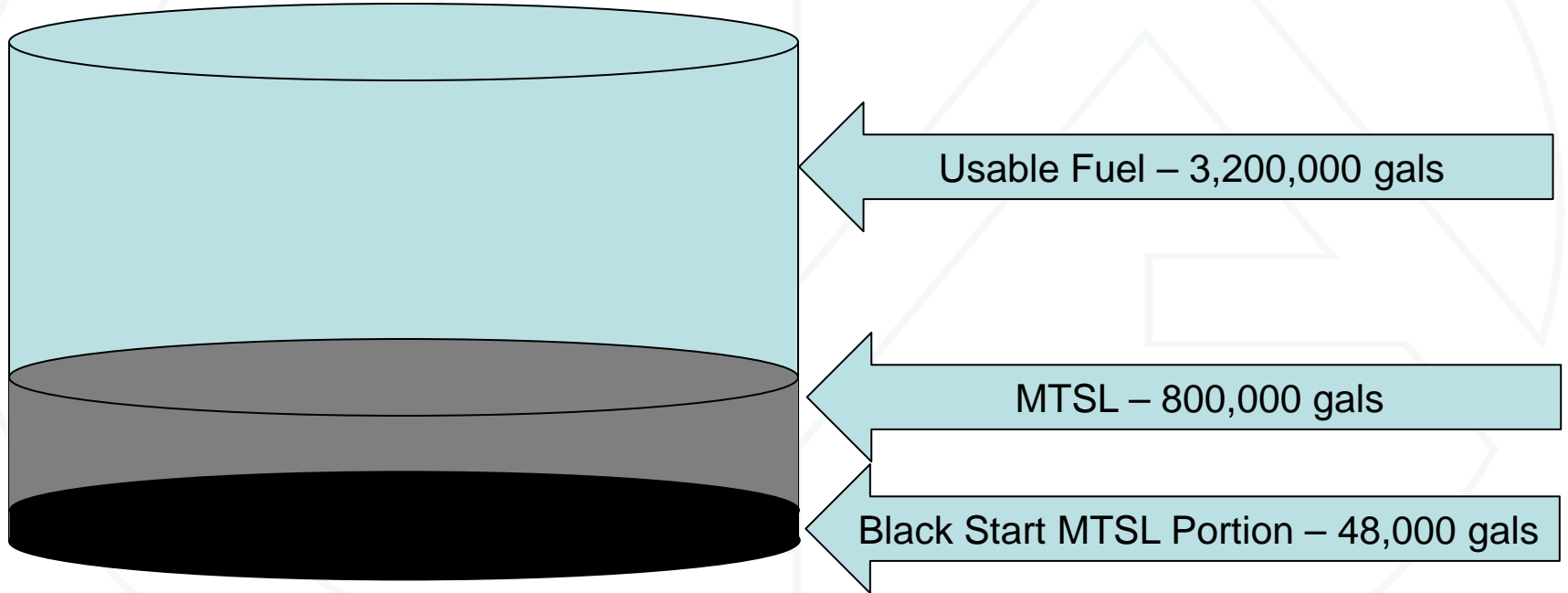# Minimum Tank Suction Level Example - Shared Tank

- **Black Start MTSL = Black Start Tank Ratio $\times$ MTSL**

  - **Where:**

  - **Black Start Tank Ratio** $= \dfrac{\text{Unit Fuel Burn Rate} \times \text{Minimum Run Hours}}{\text{Tank Capacity} - \text{MTSL}}$

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Minimum Tank Suction Level Example - Shared Tank

- **Example:**
  - **Tank Capacity: 4,000,000 gals**
  - **MTSL: 800,000 gals**
  - **Unit Fuel Burn Rate: 12,000 gals per hour**
  - **Minimum Run Hours: 16 hours**
  - **Total Black Start Fuel Burn: 192,000 gals**

  - **Black Start Tank Ratio $= \dfrac{12,000\frac{\text{gals}}{\text{hr}} \times 16\ hrs}{4,000,000\ \text{gls} - 800,000\ \textbf{\textit{gals}}} = 6.0\ \%$**

  - **Black Start MTSL = 6.0% x 800,000 gals = 48,000 gals**

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Minimum Tank Suction Level

Tank Capacity: 4,000,000 gals

Usable Fuel – 3,200,000 gals

MTSL – 800,000 gals

Black Start MTSL Portion – 48,000 gals

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PJM Method vs. IMM Method

- **PJM's method would allow recovery of carrying cost on 800,000 gals of fuel.**

- **The IMM's method would allow recovery of carrying costs on 48,000 gals of fuel.**

- **The actual incremental amount of MTSL that results from the addition of black start capability is zero.**

Monitoring Analytics

Monitoring Analytics, LLC

2621 Van Buren Avenue

Suite 160

Eagleville, PA

19403

(610) 271-8050

MA@monitoringanalytics.com

www.MonitoringAnalytics.com

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