

Black Start Minimum Tank Suction Level

Market Implementation
Committee

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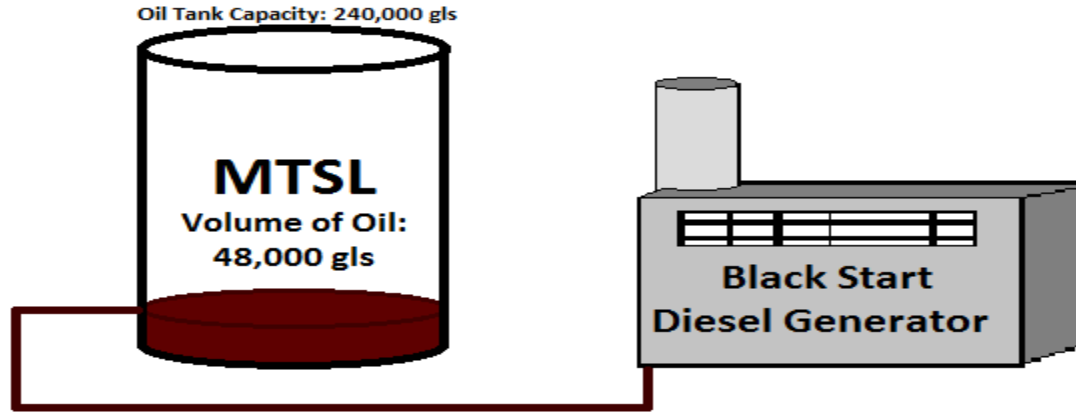


Monitoring Analytics

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.)**

Minimum Tank Suction Level - Black Start Only



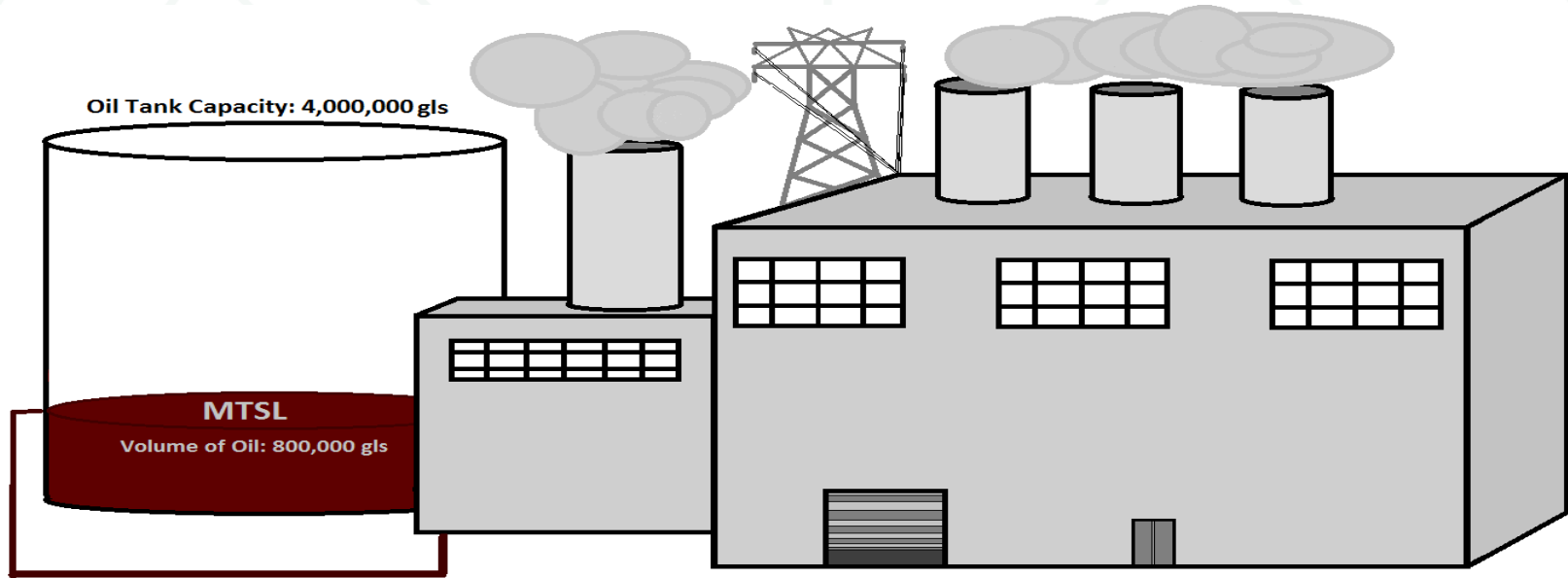
Minimum Tank Suction Level Example. Black Start Only

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

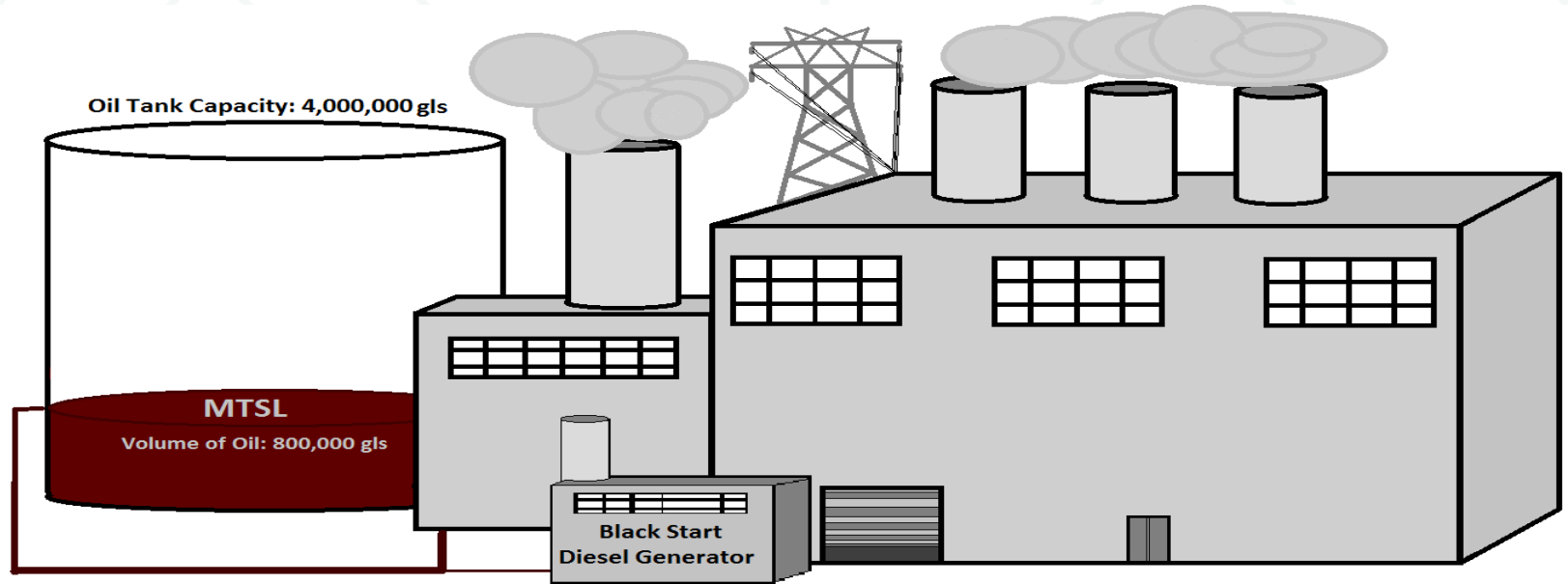
Minimum Tank Suction Level - Shared

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

Minimum Tank Suction Level – Before Black Start



Minimum Tank Suction Level - Shared



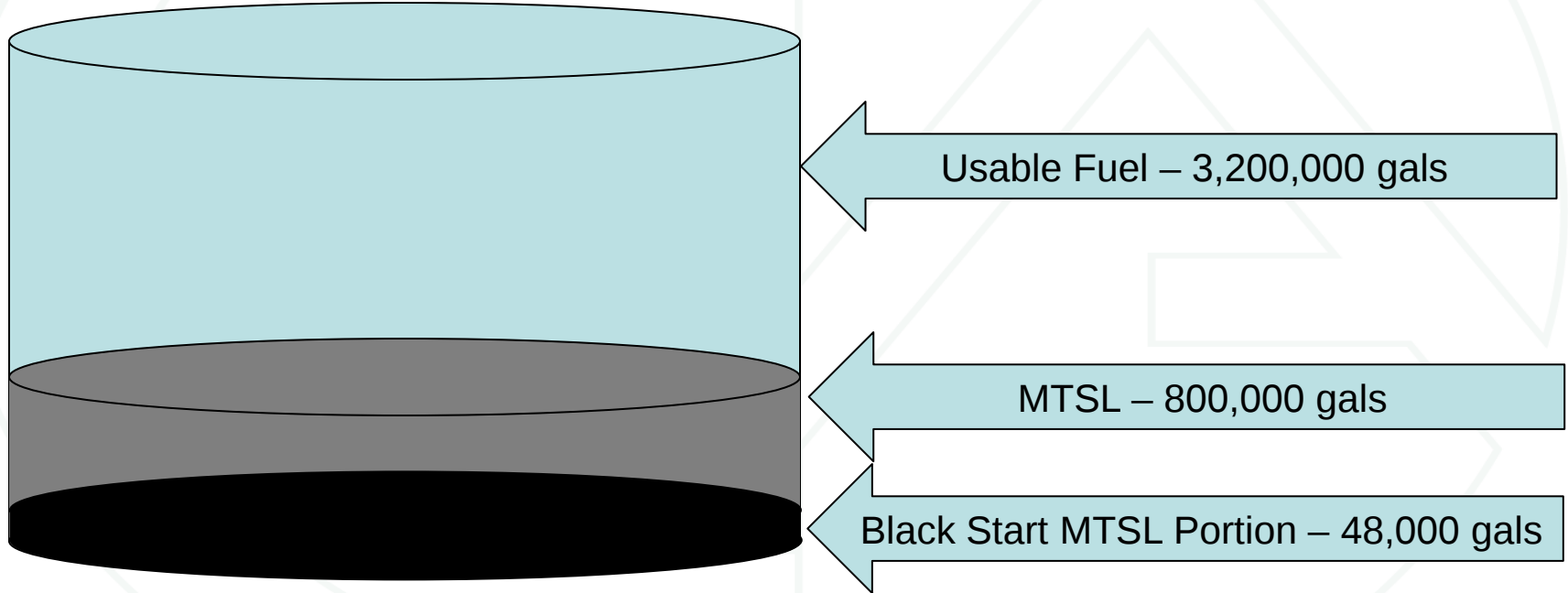
Minimum Tank Suction Level Example.

Shared Tank

- **Black Start MTSL = Black Start Tank Ratio × MTSL**
 - **Where:**
 - **Black Start Tank Ratio = $\frac{\text{Unit Fuel Burn Rate} \times \text{Minimum Run Hours}}{\text{Tank Capacity} - \text{MTSL}}$**
- **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 = $\frac{12,000 \frac{\text{gals}}{\text{hr}} \times 16 \text{ hrs}}{4,000,000 \text{ gals} - 800,000 \text{ gals}} = 6.0 \%$**
 - **Black Start MTSL = 6.0% x 800,000 gals = 48,000 gals**

Minimum Tank Suction Level

Tank Capacity: 4,000,000 gals



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.**

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