

Water Filtration in Coking Systems

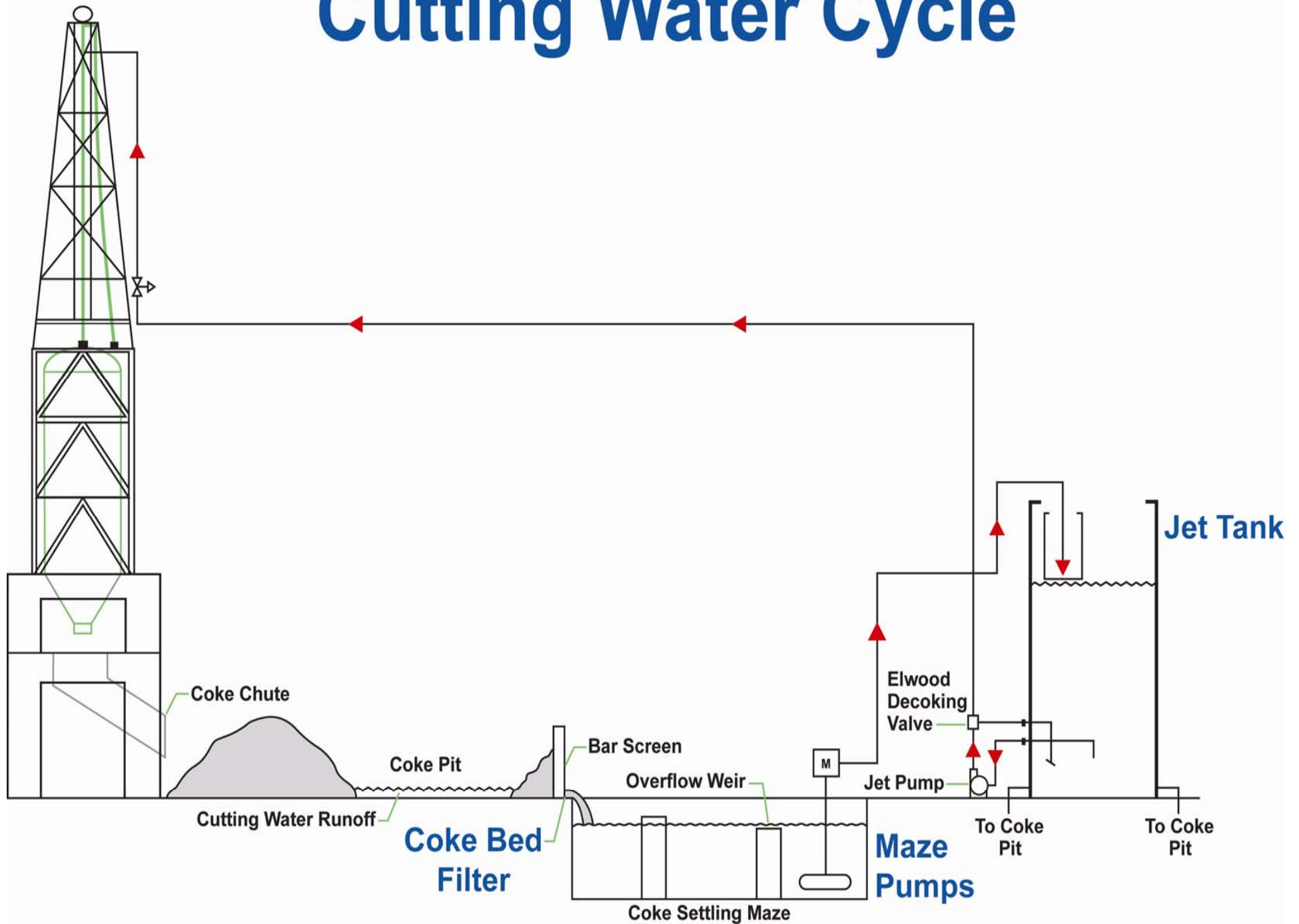
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Vice President & GM

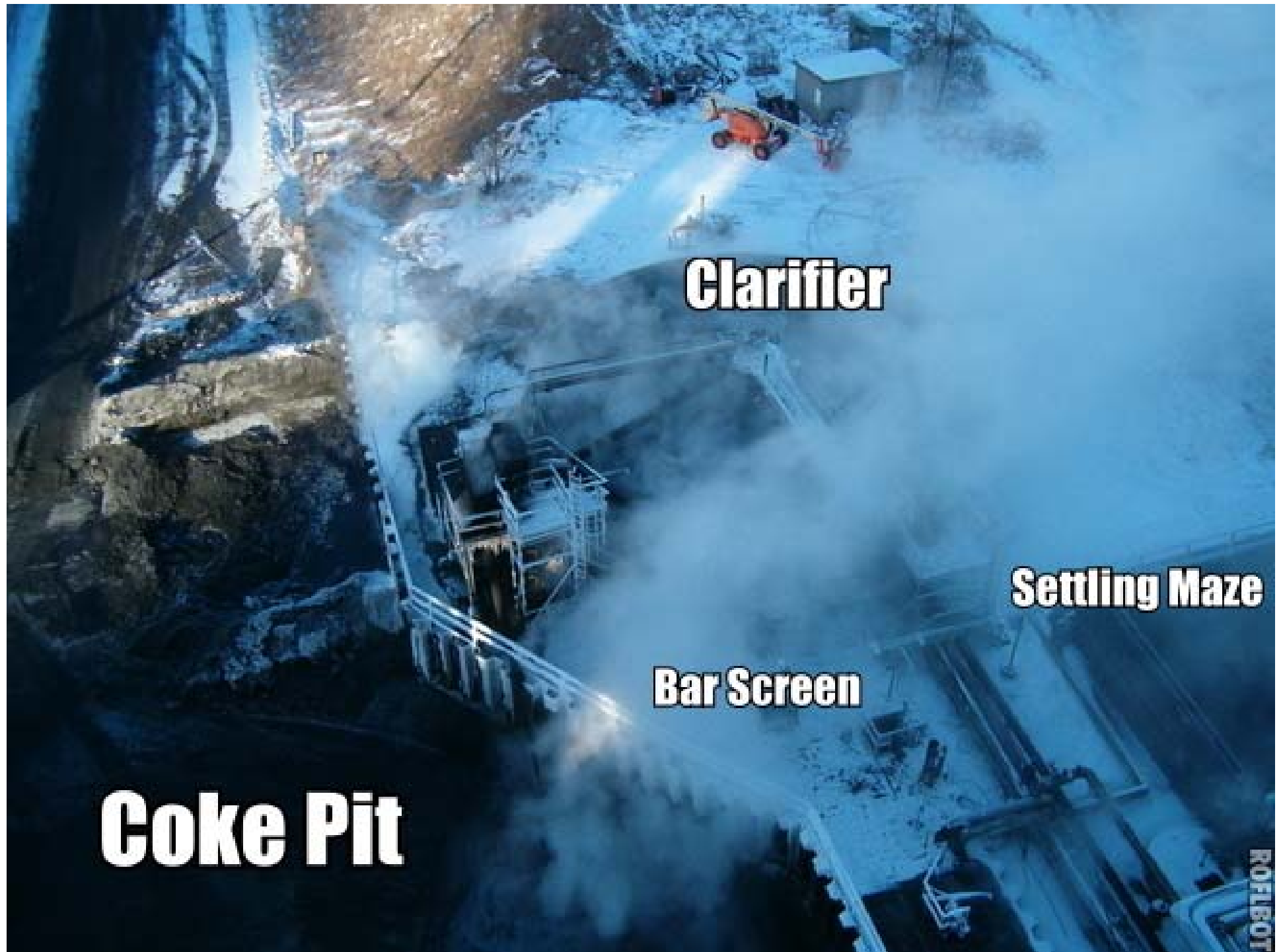


Gary Pitman



Cutting Water Cycle





Coke Pit

Bar Screen

Settling Maze

Clarifier



Clarifier

The image shows a large industrial facility, likely a wastewater treatment plant. In the upper left, there is a complex structure of metal scaffolding and pipes, which is the clarifier. Below it, a series of vertical bars are visible, which is the bar screen. At the bottom, a large amount of water is being discharged, creating a large splash and mist. The entire scene is captured in a blue-tinted photograph.

Bar Screen

Discharge





Jet Tank

An aerial photograph of a wastewater treatment plant. On the left is a large, circular, metallic tank. To its right are several rectangular basins. A worker in an orange safety vest is visible on a walkway between the tank and the basins. The water in the basins appears to have some white foam or bubbles. The entire facility is surrounded by a network of pipes and structural steel.

Settling Maze

ROEBOT



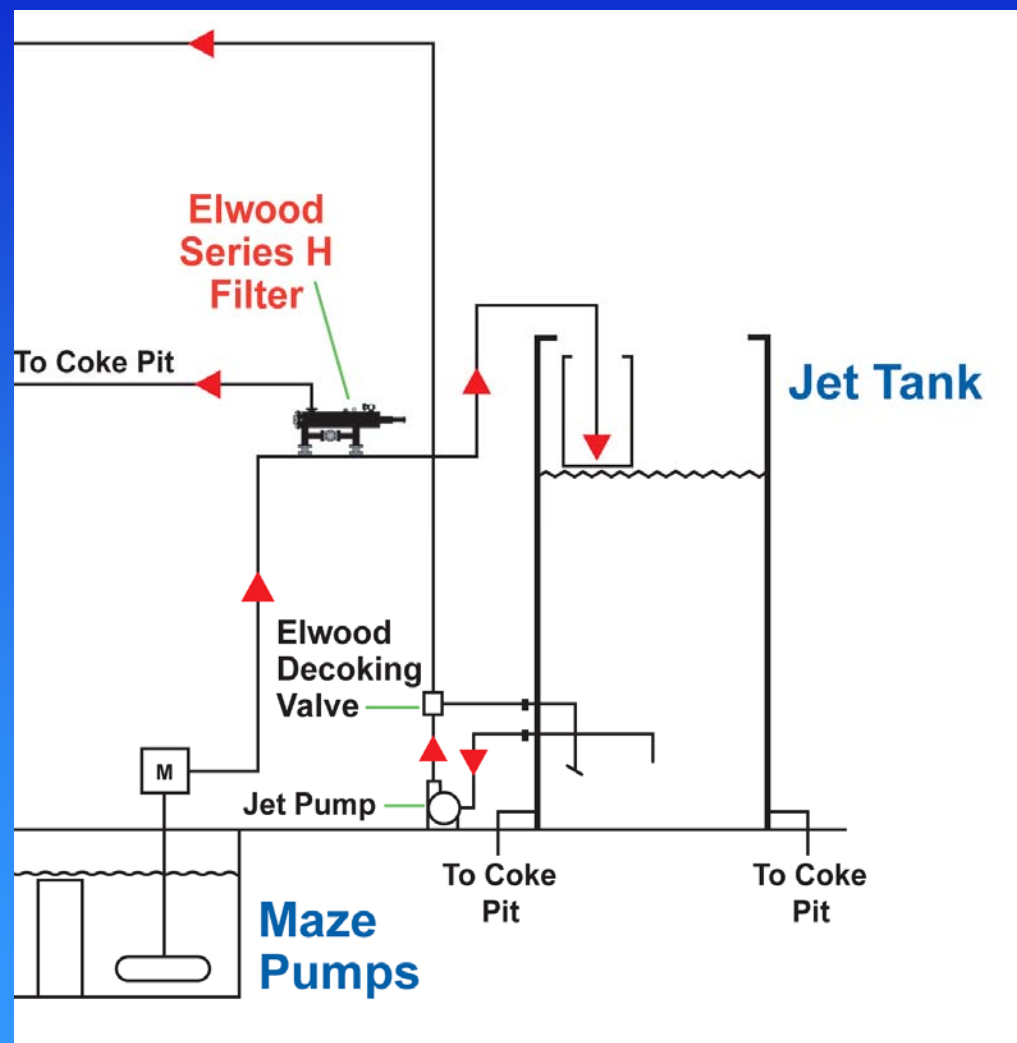
Problem

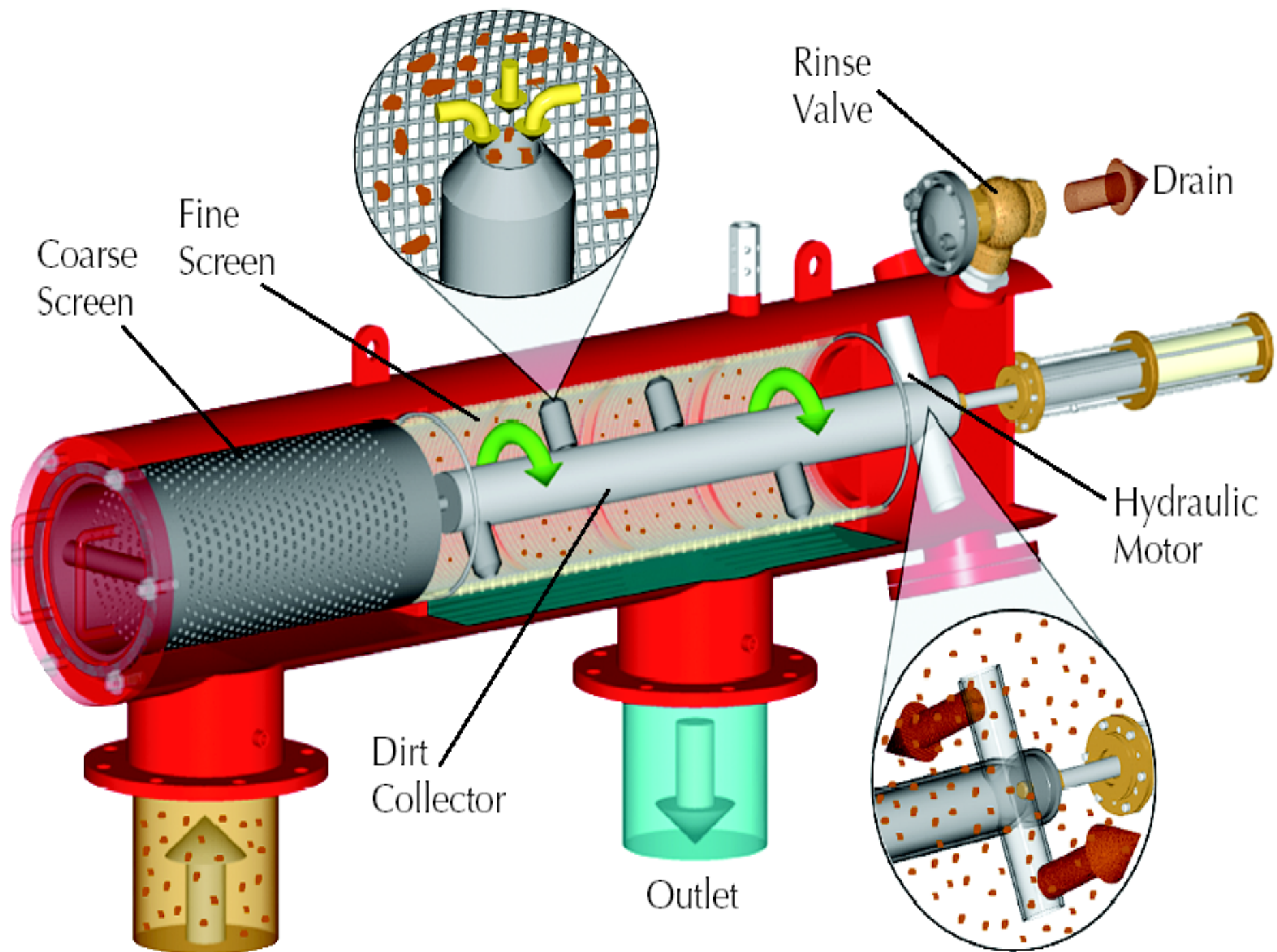
- Coke fines pass settling maze
 - Nozzles
 - Pumps
 - Pipes

Ideal Solution

- Protect downstream equipment
- High reliability
- Low operation & maintenance
- Recovers coke fines
- Low investment cost
- Easily incorporated into existing system
- Zero impact to environment

Proposed Solution







Technical Specifications

- Provides continuous filtration
- Flows: 110 to 12,000 gpm
- Flange Sizes: 2 to 24 inches
- Screens: 10 to 3,000 micron
- Polyester epoxy coated body (optional SS)
- Stainless steel screens
- Backwash; pressure, timer or manual
- NEMA 4x enclosure for control

Refinery Solution

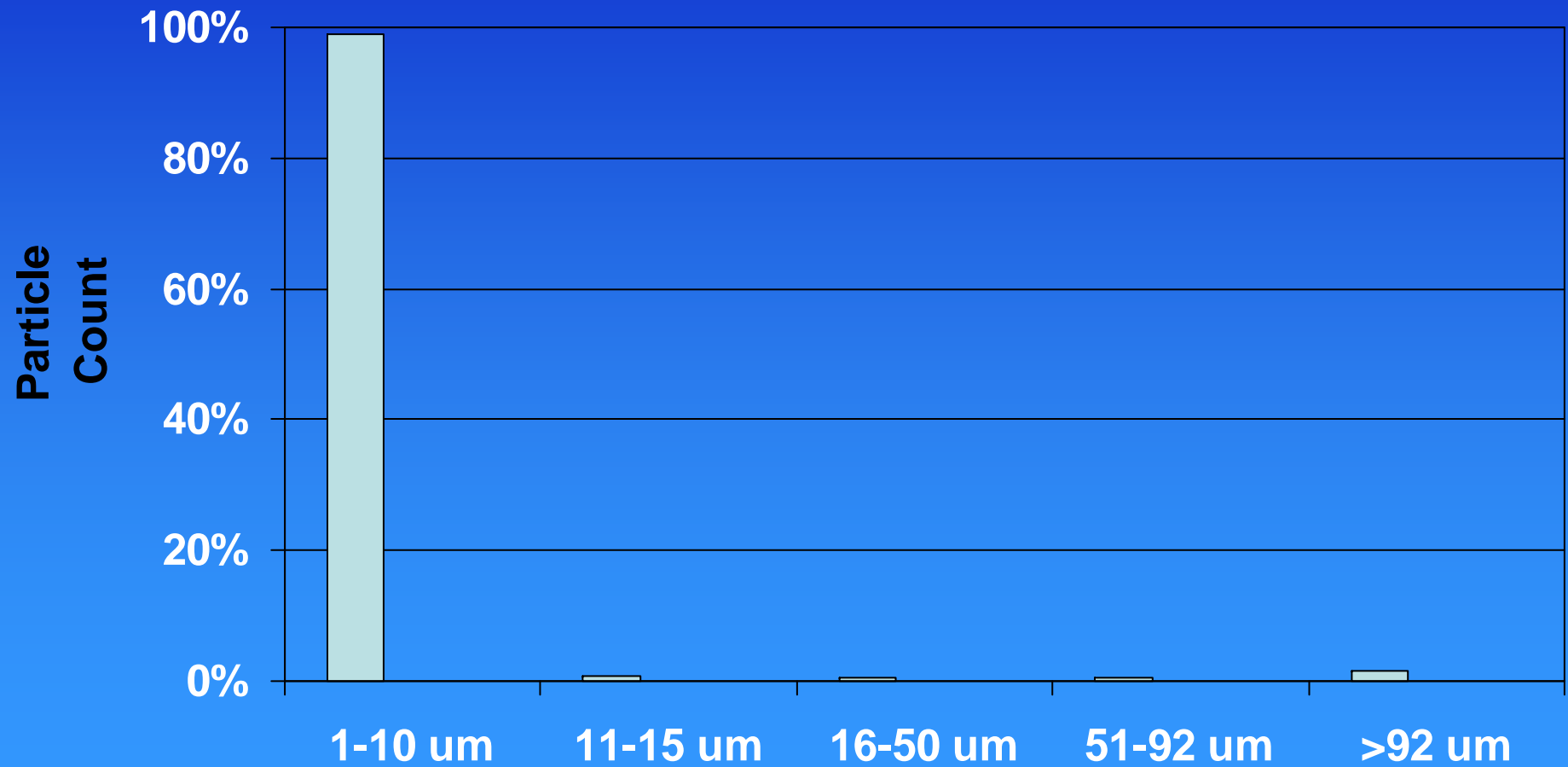
Decoking System

- 7 hours between coke cutting
- 2 hours of peak coke
- Maximum fluid temperature; 150 F
- Minimum fluid temperature; 70 F
- Pipe Size; 6"
- Estimated Flow; 1000 gpm
- Fluid sample taken

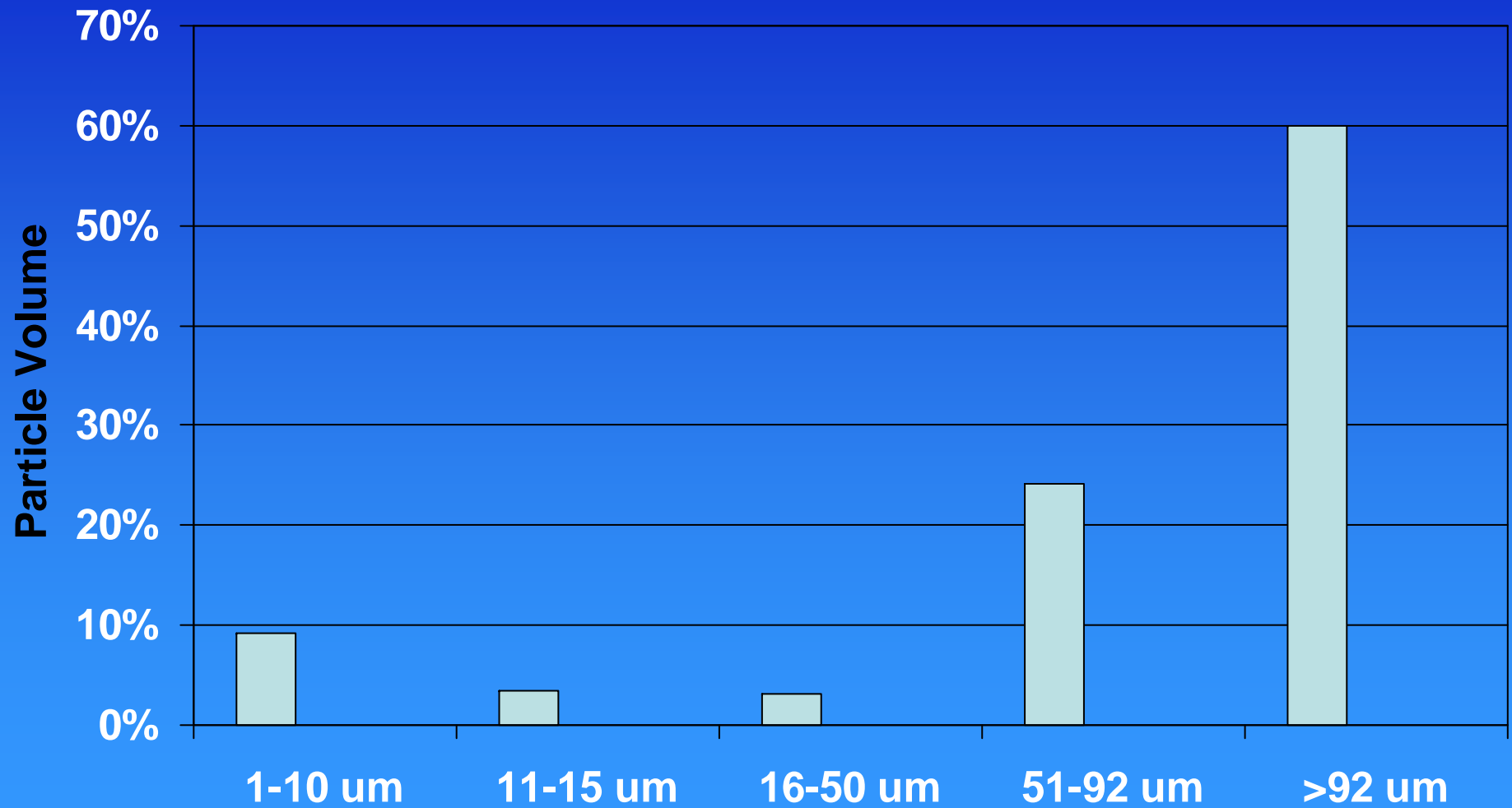
Particulate Spectrum

- 1-10 μm ; Mustard, Carbon Black Toner
- 11-15 μm ; Copier Toner
- 16-50 μm ; Ginger
- 51-90 μm ; Cement Dust
- 100-1000 μm ; Beach Sand

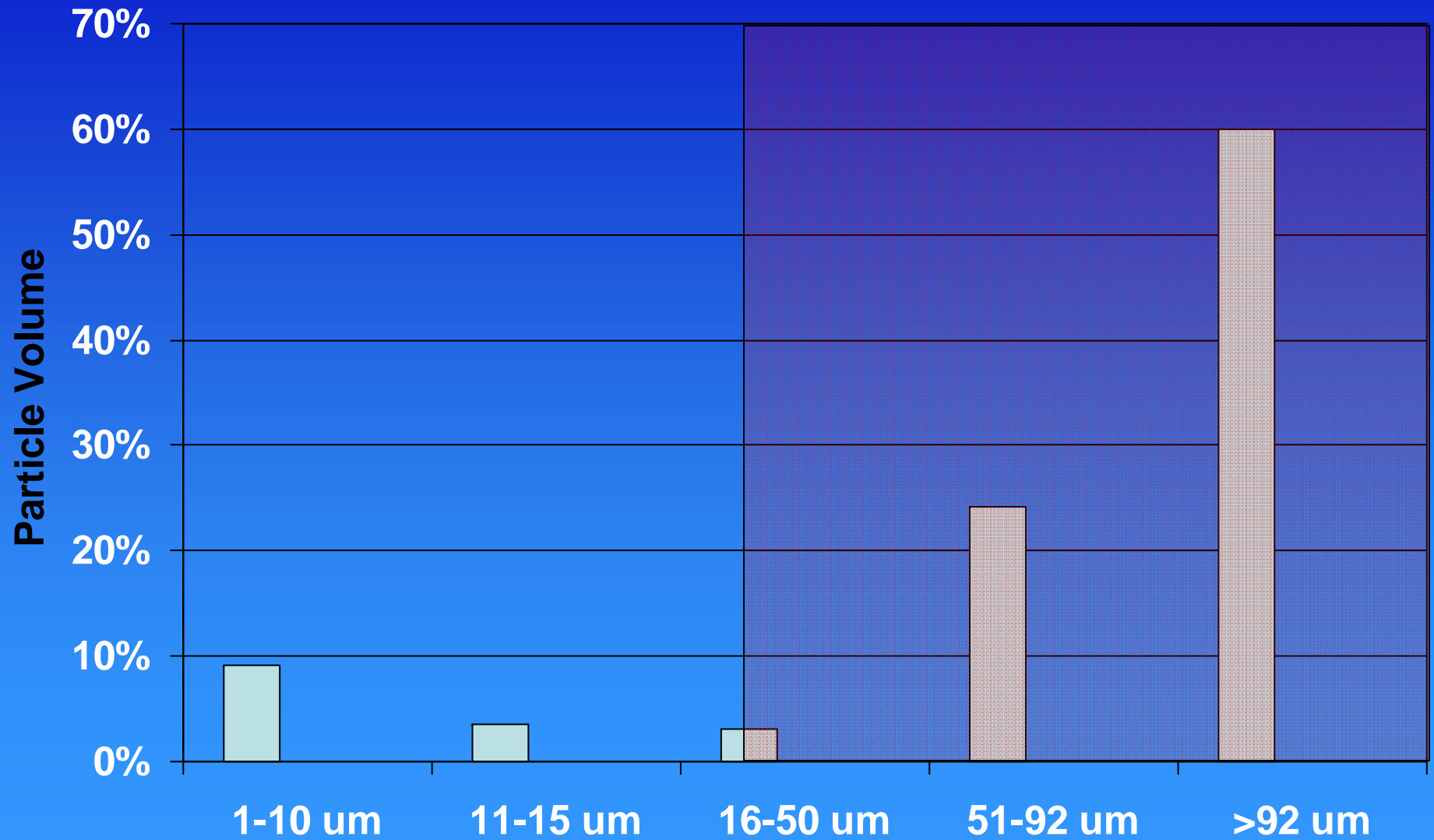
Particle Distribution by Count tss=262ppm



Particle Distribution by Volume

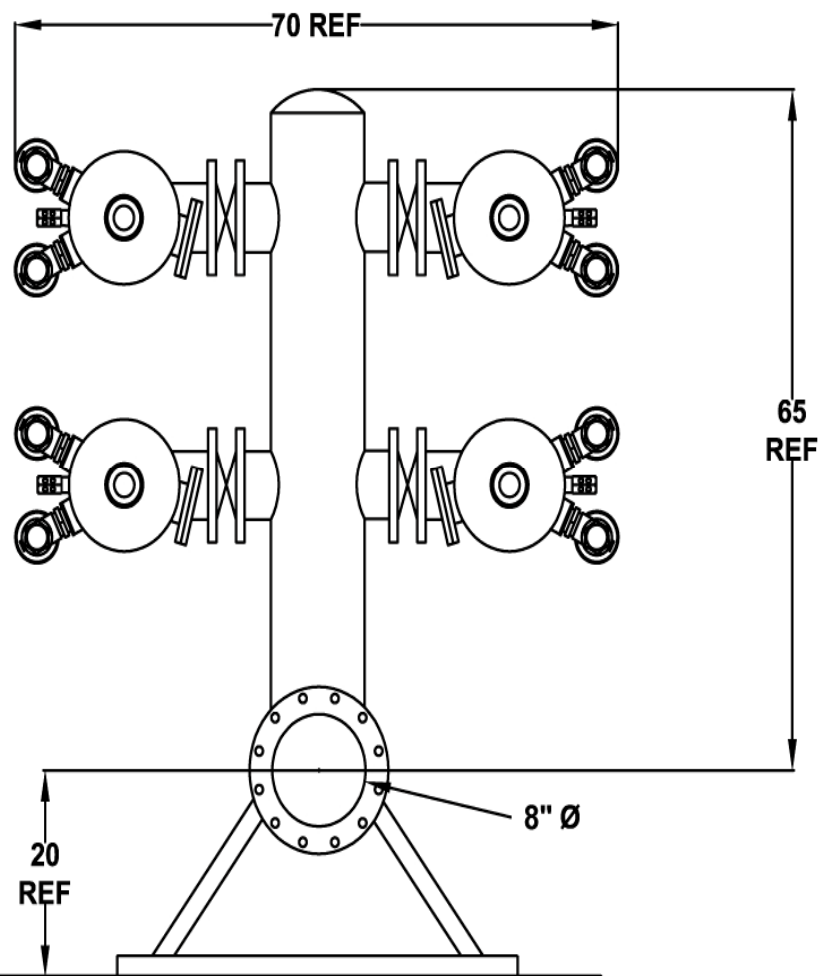
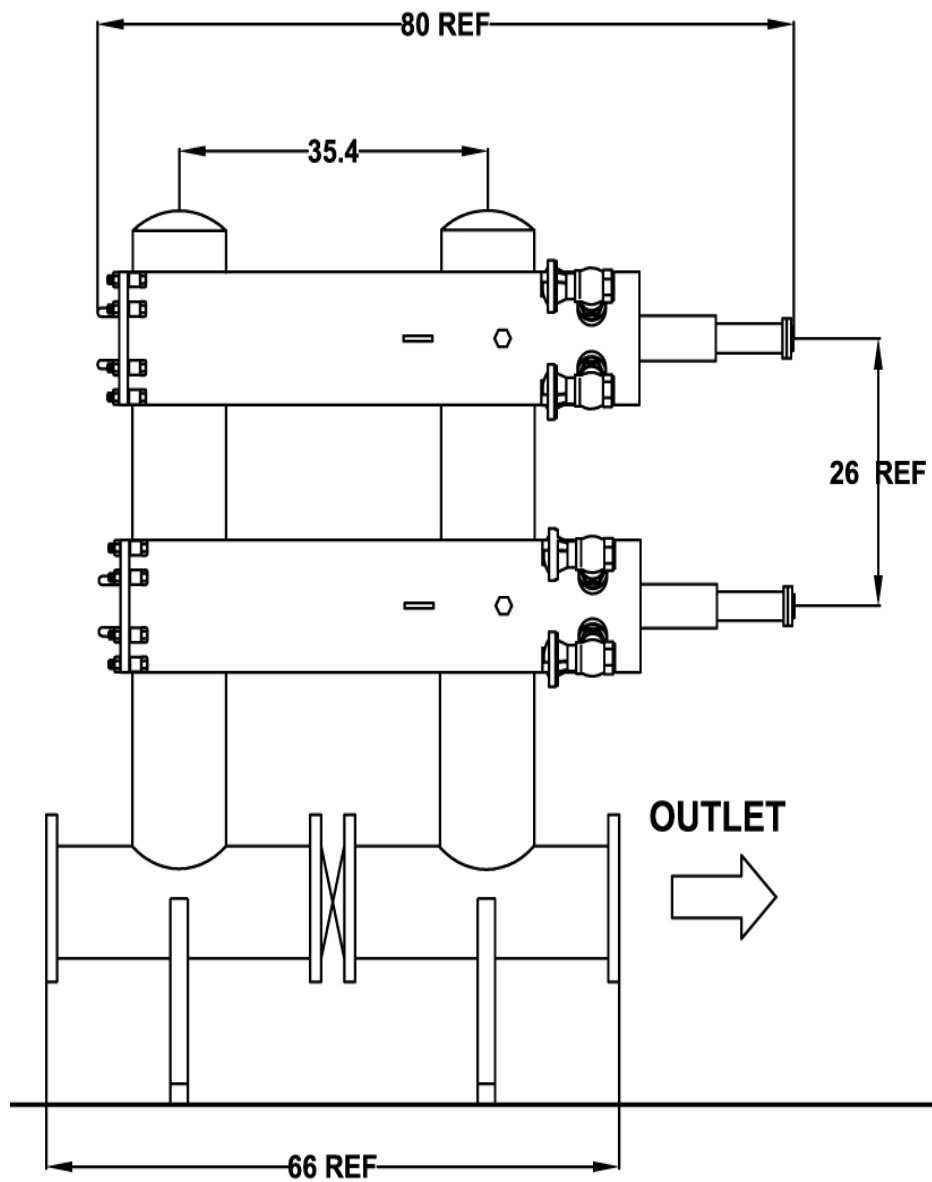


Filter Coverage



Specifications

- **First Stage (80 micron)**
 - 8" Main
 - (4) 4" filters with 80 micron screen
 - Remove approx. 60%
- **Second Stage (25 micron)**
 - 8" Main
 - (4) 4" filters with 25 micron screen
 - Remove approx. 15% to 20%
- **Isolation valves**
- **NEMA 4x control**



Costs

- \$95,000 for filter system
- Additional costs
 - Installation costs
 - Costs associated with environment

Preventative Maintenance

- **Monthly**
 - Activate by-pass & isolation valves
- **Quarterly**
 - Check & clean coarse screens
 - Trigger manual rinse

Wear Items

Description	List Price	Typ. Lifetime
Shaft Bearings	\$37.00 ea. (8)	1-2 yrs.
Hydraulic Repair Kit	\$96.00 ea.(8)	5 yrs.
Solenoid	\$105.00 ea. (8)	5-10 yrs.
Flush Valve Actuator	\$198.00 ea. (16)	5-10 yrs.
Fine Screen (80 um)	\$1,194.00 ea. (4)	5-10 yrs.
Fine Screen (25 um)	\$2,339.00 ea. (4)	5-10 yrs.
Dirt Collector Assm.	\$556.00 ea. (8)	5-10 yrs.
Coarse Screen	\$278.00 ea. (8)	10 yrs.

Typical Maintenance Costs

\$2,600 per year

Filter

Water Maintenance

Fluid Maintenance

- Dilution
- pH
- Bacteria & fungi levels
- Water hardness
- Filtration

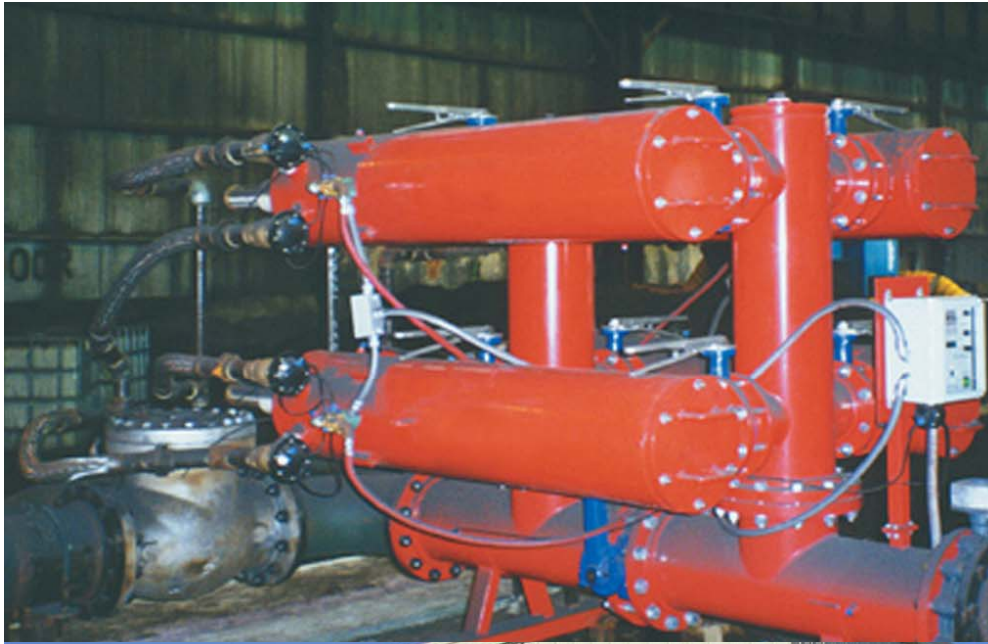
Fluid Guidelines

pH 8.0 to 9.5

Hardness 50 to 200 ppm

	Servo, proportional valves	40 micron
Filtration	Directional, pressure control valves	75 micron
	Descale, stop valves	150 micron

Installations



Summary

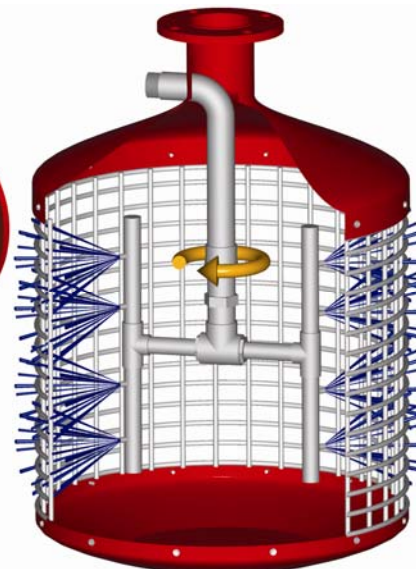
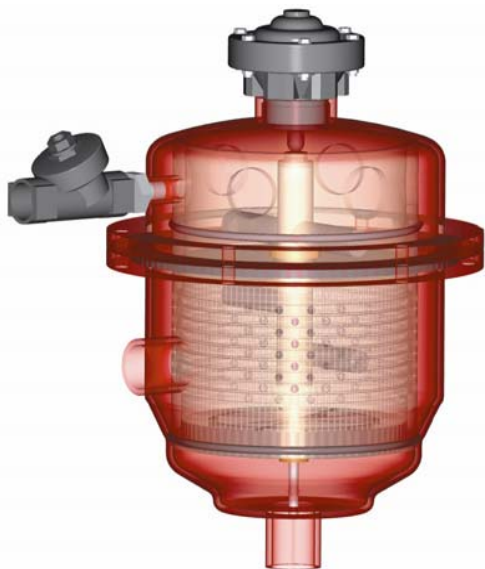
Proposed vs. Ideal Solution

- ✓ Protect downstream equipment
- ✓ High reliability
- ✓ Low operation & maintenance
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Getting Started

- Fluid type
- Viscosity if not water
- Min/Max fluid temperature
- Min/Max environmental temperature
- Min/Max system pressure
- Flow rate
- Piping size
- Size of particulate to filter
- Fluid sample
- System schematic

Other Products



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