

Grade 1 Collection Systems Operator Need-To-Know Criteria (Subject Areas)

The following list of categories suggests topics of information which are important to know in order to be a successful and proficient Grade 1 Collection Systems Operator. The list may not be all inclusive, and knowledge of additional topics may be of benefit to the operator.

Category of Information: Process

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|---|---|
| <p>Gravity Sewers</p> <ul style="list-style-type: none">• Describe• Operation/maintenance• Design/Construction <p>Pressure Sewers</p> <ul style="list-style-type: none">• Describe• Operation/maintenance• Design/Construction <p>Vacuum Systems</p> <ul style="list-style-type: none">• Describe• Operation/maintenance• Design/Construction <p>Sewer Equipment</p> <ul style="list-style-type: none">• Application• Maintenance• Use/Procedure <p>Aeration</p> <ul style="list-style-type: none">• Purpose• Describe types <p>Chemical Additives</p> <ul style="list-style-type: none">• Purpose• Methods• Equipment <p>Chlorination</p> <ul style="list-style-type: none">• Purpose• Methods• Equipment | <p>Corrosion Control</p> <ul style="list-style-type: none">• Describe• Methods <p>Infiltration/Inflow Devices</p> <ul style="list-style-type: none">• Describe• Methods of inspection and testing• Concept of sewer rehabilitation <p>Lift Stations</p> <ul style="list-style-type: none">• Operation/maintenance• Design/Construction <p>Flow/Velocity Measurement</p> <ul style="list-style-type: none">• Describe• Purpose• Flow regulators <p>Manholes</p> <ul style="list-style-type: none">• Describe• Purpose• Design/Construction <p>Cross-Connection</p> <ul style="list-style-type: none">• Definition• Types of devices |
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Category of Information: Support Systems/Equipment

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| <p>Motors</p> <ul style="list-style-type: none">• Single phase• Poly phase• Variable speed <p>Drives</p> <ul style="list-style-type: none">• Coupled• Direct (Shaft; Gear)• Speed Reducer (Fixed; Variable)• Right angle <p>Blowers and Compressors</p> <ul style="list-style-type: none">• Centrifugal• Positive displacement (Rotary; Piston) <p>Generators – AC & DC</p> <p>Engines – Gasoline, Diesel & Gas</p> <p>Hydrants (Basic)</p> | <p>Pumps</p> <ul style="list-style-type: none">• Air Lift• Centrifugal• Positive displacement<ul style="list-style-type: none">○ Piston plunger○ Progressive cavity○ Diaphragm• Screw• Turbine• Metering• Ejector <p>Joints</p> <ul style="list-style-type: none">• Flanged• Compression• Dresser• Victualic• Fused• Threaded |
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Category of Information: Support Systems/Equipment (continued)

Valves

- Ball
- Check
- Globe
- Gate
- Plug
- Petcock
- Pressure control
- Vacuum relief
- Mud
- Butterfly
- Multiport
- Telescoping
- Sluice Gate
- Air release
- Foot
- Altitude

Pipes

- Types
- Cleaning/maintenance
- Sewer rehabilitation

Fittings

- Coupling
- Union
- Plug/Caps
- Corporation (Ferrell; Cock)
- Curb Stop
- Special

Odor Control

- Biofilters
- Chemical Additives
- Scrubbers

Rolling Stock

- Service vehicles
- Fork lifts
- Trucks
- Tractors
- Trailers
- Lawn Mowers
- Loaders
- Portable pumps
- Generators

Chemical Feeders

- Solids
- Liquids
- Slurry

Measuring and Control

- Signal generators
 - Kennison nozzle
 - Magnetic flowmeter
 - Parshall flume
 - Proportional weir
 - Rectangular weir
 - Venturi
 - Propeller meter
 - Ultrasonic
 - Pitot tube
- Signal transmitters
 - Electric
 - Pneumatic
 - Hydraulic
 - Mechanical
 - Telemetry
- Signal receivers
 - Counters
 - Indicators
 - Log Scale Indicators
 - Totalizers
 - Recorders
 - Combination recorders
- Meters
 - Hydraulic – Rotameters
 - Electrical – Amp
 - Electrical – Watt
 - Electrical – Watt Hour
 - Electrical – Multi
 - Electrical – Multi – VOM
 - Electrical – Megger
 - Mechanical – RPM
- Alarms
- Controls
 - Pneumatic
 - Float
 - Hydraulic
 - Electrical
 - Telemetry
 - Timers

Transformers

- Step down
- Step up

Safety Equipment

- Personal protection gear
- Traffic control (Warning devices; Barricades)
- Hazard detection
- First Aid/Hygiene

Category of Information: Laboratory

Materials testing

- Concrete
- Piping

Category of Information: General Information/Knowledge

Units of expression

- Define units
- Convert units

Sources and characteristics

- Characterizing sources
- Quality/quantity
- Identify characteristics
- Describe effects

Electrical

- Basic concepts
- Math calculations

Hydraulics

- Basic concepts
- Math calculations

Maps/plans

- Interpretation and use
- Describe types