Time to Train

Qualification Card Knowledge Transfer Tool

Frank Loethen
Section Manager - Training
Challenges

- Aging workforce
- Technological advancements
- Increasing rate of change
- Lack of Knowledge transfer
Training in the Good Ol’ Days

1. Georgia State Licensing:
   HS/GED Coursework
   Experience
   Pass the test

2. Plant training by Osmosis
   - a usually effortless, often unconscious assimilation
   [Webster dictionary]
Training Outcome – Good Ol’ Days

State License  Osmosis

Operator ability needed for 14.5 MGD Oxidation Ditch Plant

1. GA required training for all plants
2. Plant training by Osmosis

Time to train a competent operator

Knowledge + Skill

Experience  Time (years)
Gwinnett County Population Challenge

Population

The Great Recession
2012 Plant Upgrades

Yellow River WRF
Lilburn, GA
2007
Increased Operator ability needed
For 22 MGD Membrane Bioreactor Plant

Warning signs:
- Never enough time
- Never enough resources
- Never enough people
- Lack of confidence
- Errors in operations
- Unsafe acts / near misses
Closing the Skills Gap

1. Identify sources of knowledge
2. Develop and implement a knowledge transfer system
3. Quality assurance
4. Feedback and change management method
Knowledge Source #1 (EOM)

Electronic O&M (EOM) manual available to plant personnel:
- Written in HTML
- Readable with any web browser

Yellow River Water Reclamation Facility

Primary Screening
Keys to Operation and Control

<table>
<thead>
<tr>
<th>Objective</th>
<th>To remove debris from the raw wastewater, to protect downstream pumps and other mechanical equipment.</th>
</tr>
</thead>
</table>
| Variables Affecting Performance | - Flow from the pump stations  
- Amount of screenings |
| Process Control Parameter | - Screen level and flow control setpoints  
- Screen and washwater timer settings |

<table>
<thead>
<tr>
<th>Control</th>
<th></th>
<th>Alternate Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary screens and screw compactors in auto to operate intermittently or continuously based on setpoints.</td>
<td></td>
<td>Each component can be operated in manual mode.</td>
</tr>
</tbody>
</table>

| Operation | One primary screen and one screw compactor in service. | When in auto, standby screen and screw compactor are automatically put into service to accommodate high level upstream of the screens. |
### Primary Screening
#### Primary Screens

#### Pre-Startup Standard Operation Procedure

<table>
<thead>
<tr>
<th>Step</th>
<th>Remarks/Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check that power to the drum screen is tagged out. Visually inspect the screen, as much as accessible, for loose bolts, tools, bracing, etc. or any other items used on the screen. Check that all tools and foreign materials have been removed from the channels. Check that all personnel are clear of the screen and are aware that equipment is about to start.</td>
</tr>
<tr>
<td>2</td>
<td>Verify the tolerance of the wall and side seals. Verify all mesh panel bolts and the nuts are properly tightened. Refer to manufacturer's installation instructions and complete any required pre-startup checks.</td>
</tr>
<tr>
<td>3</td>
<td>Check the oil level in the main bearing oil reservoirs, midway in the sight glass. Check the oil level in the drive gearbox, midway in the sight glass. Check that the breather is fitted and clean. Verify lubrication, in accordance with manufacturer's instructions.</td>
</tr>
<tr>
<td>4</td>
<td>Verify lubrication of manshaft and drive shaft bearings. Grease, if needed, the drum and drive shaft bearings until grease appears from the bearing vents.</td>
</tr>
<tr>
<td>5</td>
<td>Check that all guards and handrails are in position and that all cover doors are closed. None.</td>
</tr>
<tr>
<td>6</td>
<td>Verify the spray nozzles discharge is properly adjusted to discharge debris into hopper. Check that the screw compactor is also ready for operation.</td>
</tr>
</tbody>
</table>
Qualification (Qual) Card

2. Influent Handling
2.1 Influent Pump Station
2.1.1 Read the Influent Handling section of the YR Operations Guide and all Influent Pump Station Standard Operating Procedures (SOPs).
2.1.2 State the function of the Influent Pump Station (IPS), Makers and Pumps (IPs).
2.1.3 Draw a one-line diagram of the Influent pump station including: Influent gate, Makers, Influent inlet and outlet gates, Webet 1 inlet gate, Webet 162 division gate, Influent Pumps, Influent pump inlet gates.
2.1.4 Discuss the theory of operation of Webet level control and pump operation.
2.1.5 Discuss the recommended and alternate operation modes of the IPS.
2.1.6 Perform pre-startup checks, startup, normal operating, and shutdown of the Influent Makers and Pumps.
2.1.7 Discuss the specific safety, FRR, and housekeeping requirements associated with the IPS.
2.1.8 Walk through the Influent Pump Station and discuss how to perform Plant rounds.

2.2 Tom Smith Road Pump Station
2.2.1 Read the Tom Smith Road Pump Station section of the YR Operations Guide and all Tom Smith Road Pump Station SOPs.
2.2.2 State the function of the Tom Smith Road pump station, Makers, and Submersible Pumps.

Instructor Guide

2. Influent Handling
2.1 Influent Pump Station
2.1.1 Read the Influent handling section of the YR Operations Guide and all Influent pump station Standard Operating Procedures (SOPs).
2.1.2 State the function of the Influent Pump Station (IPS), Makers and Pumps (IPs).

The Influent pump station is equipped with material and submersible pumps, for pumping crude in the Influent wastewater before pumping to the screening and grit removal systems in the Preliminary-Primary Treatment Building. Three reactors are in three separate chambers and four submersible pumps are in two waterways separated by gates. The oxidation and waterways can be controlled using the station control and pumps gate to influent Pumps, Influent Pump inlet gates.

start with making new diagrams, add details as necessary

Qual Card - Plant specific training that links the Operator to the Knowledge Sources
Structured and documented training from influent to effluents
Instructor Guide – aid to Supervisors to ensure standardized training
Training Implementation

1. Georgia State Licensing:
   - HS/GED
   - Coursework
   - Experience
   - Pass the test

2. Plant Training by Osmosis

3. Plant Specific on the job training through Qualification Cards
Student training method:
1. Reading EOM & SOPs
2. Discussions with Supervisor
3. Draw one-line diagrams
4. Observing and Performing procedures
5. Manager Quality checks

Retraining and feedback loops ensures quality training and improvements
1. GA required training for all plants
2. Plant training by Osmosis
3. Plant specific training

- Greater ability & Reduced time to train

- State License
- Osmosis
- Qual Card
Recommendations for Implementation

1. Assess and utilize your available resources
2. Identify your knowledge base(s)
3. Define what knowledge and skill it takes to be competent
   a. Knowledge + Skill = Ability
4. Develop a reinforcement method of training
   a. Read, Discuss, Draw, Observe, Perform
5. Quality checks by Management to ensure effective training
6. Feedback / Change management
7. Measure and improve your time to train to stay ahead of technology
Big Takeaways

• Plants and processes are becoming more complex
• A skills gap is created when technology outpaces ability
• Additional plant specific training is necessary to close the skills gaps
• A method of knowledge transfer can be implemented (Qual Cards) to manage the process