Ensuring Effective MV Knowledge Management

*Combining Skill Sets to get the Best Products*

February 2015
Outline

- Program context
- Deliverables demonstration
- Success & Challenges
- Q&A
What is Utility Specific Knowledge?

- Technical knowledge documented in design reports and drawings – *much of this has not been kept up-to-date or was never documented*

- Knowledge of MV systems and equipment that staff have ‘in their heads’

- Knowledge transfer traditionally done verbally by experienced staff while supervising the work
  - Learn as you go
  - Learn as it breaks
  - “Ask Fred”
## MV Retirement Statistics

~ 38% of utilities staff are eligible to retire in the next 9 years.

### Potential Retirements over next 9 yrs (2015-2023)

<table>
<thead>
<tr>
<th>Department</th>
<th>Age 62 (%)</th>
<th>Factor 90 (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Waste Services [545]</td>
<td>23</td>
<td>17</td>
<td>40</td>
</tr>
<tr>
<td>Water Services [381]</td>
<td>18</td>
<td>18</td>
<td>36</td>
</tr>
</tbody>
</table>

**Factor 90:** Full pension when age + years of service = 90

**Age 62:** Average retirement at MV
Minimizing the Impact of this Loss

- All O&M divisions recognized the impact of the dependence on knowledge in people's heads and inconsistent and incomplete learn-as-you-go training.

- Recognition of the linkage with effective safety management programs, performance management and asset management.

- The formal training and procedures development projects in water treatment have shown to be a proven model for capturing and transferring this knowledge and it was agreed to move forward with this approach.
MV Technical Knowledge

- Business
- Safety
- Technical

- High School
- University/College
- Industry Specific (AWWA, WEF, EOCP)
- MV Specific
TAP in Brief

- The Technical Training and Procedures (TTAP) Program is a multi-year technical knowledge management program which started in 2013.

- This program is a key element of succession planning and is strongly linked to safety programs as well as performance management.

- Key aspect of the program is to put the work processes and resources in place to ensure ongoing access, support and maintenance of the deliverables.
Consulting Services

- Developing this type of program relies heavily on experienced MV staff resources.

- To optimize involvement of MV staff we needed to partner with a technical training consultant on multi-year contract(s). Partnership provides:
  - Complementary utility process knowledge
  - Adult learning and instructional design expertise
  - Consistency in content development
  - Learning management system programming
  - Facilitation, writing and editing resources
  - Graphics development expertise
Program Valuation

“Best practice indicates that complete operator training and documentation for a water or wastewater facility may be .25% to .75% of the total project capital cost”

Gerry Stevens (AECOM), BCWWA 2007

The actual spending ratio at SCFP was 0.33%; approximately $1M for a facility with a capital construction cost of $300 million.

Estimated value of MV water and liquid waste infrastructure (does not include WWTPs):

“The current replacement value of the GVWD assets is estimated at $2.4 B and the GVS&DD assets is estimated at $3.1 B.”

Asset Register Memo from Matthew Walker to A.Van Roodselaar, Aug. 23, 2013
MV’s Blended Approach

Procedures
(Operations, Maintenance, Lockout, CSE)

Resources: equipment lists, drawings, process narratives, SMEs, MTAs etc.

Ongoing Support & Maintenance
Phase 1: Assessment
- Equipment verification
- Task analysis
- Maintenance task analyses
- Competency mapping
- Gap analysis
- Curriculum development
- Prioritization
- Development plan and schedule

Phase 2: Development & Delivery
- Procedure development
- E-learning development
- Field guides
- Scenario training
- Troubleshooting guides

Phase 3: Continuous Improvement
- Ongoing support model
Project Communication
Maintenance Task Analyses (MTA)

MTAs are needed to move toward reliability centered maintenance. Process involves:

- identifying the criticality of each piece of equipment
- reviewing possible failure modes
- developing the appropriate maintenance strategy

COQ UV MTA
Sapperton PS MTA
Procedures

Maintenance Procedures
IIWWTP – Bar Screen Overhaul

Operations Procedures
CRWPS Isolate and Remove a Pump From Service
Field & Review Guides

Field Guide

AIWWTP FE Disinfection System

Review Guides

AIWWTP FE Disinfection System

December 1, 2014

Annacis Island Wastewater Treatment Plant Operator Training

Final Effluent (FE) Disinfection System Field Guide

Operator Name:  
(Please Print)