Competency Standards for SFPUC’s Wastewater Enterprise: A New Workforce Reliability Tool
What is a Competency Standard?

- A means to measure performance
- A framework for training
- A system to qualify operators to perform specific duties without direct supervision
Do not use this layout as the default layout. The Horizontal Arch, Title and Content layout is intended as the default layout.
Three Factors Drove Creation of the Competency Standards

- NPDES Permit
- BOD
- TSS

40% Pending Retirements

40% Efficiency

60% Consistency

Performance Target
Framework for WWE Operational Competency Standards for Southeast Treatment Plant

Staff

Manager
Superintendent
Chief
Senior
Journeyman
Apprentice

Technical

Processes

Managerial

Sodium Hypochlorite
Sodium Bisulfite
Primary Disinfection
Secondary Disinfection

Disinfection
Headworks
Etc.
Method of Approach

Select a priority unit process

Review available documentation

Prepare questions and standard answers for the written, field and oral assessments

Conduct a trial run

Revise and roll out with associated training

Maintain transparency; post training and assessment materials to KM system or wiki tool
It Is Important to Set a Standard Naming Convention

- Treatment Plant
  - SEP
- Process
  - Disinfection
  - Air
- Systems
  - Sodium Hypochlorite
  - Sodium Bisulfite
  - Secondary Disinfection
- Sub-systems
  - Feed (day) tank
  - Feed pumps
  - Valves
Roll Out of New Standards

Trial Run with Subset of Seniors

Beta Test with Remaining Seniors

Implement with All Journeymen

Recertify every 3 years
Benefits of Training Chief as overseer

- Consistency in performance of Operators across 5 rotational watches
- Consistency among Supervisors
Who We Are

San Francisco Public Utilities Commission, Wastewater Enterprise

~47 mi² land area
800,000+ population served
80 MGD average daily flow
577 MGD wet weather capacity
200+ MG storage capacity
120+ Operations employees
North Point Wet Weather Facility
Treasure Island Water Pollution Control Plant
Documentation

Existing SOPs and O&M Manuals
- Often out of date and inconsistent with current best practice
- Appropriate as reference
- Needed much work to update fully

New SOPs and guidance documents
- Identify all “must know” items
- Create pertinent questions/answers
- Complete quickly (manuals will take longer)
Current and Future Challenges

- Constantly changing wastewater system
  - New technologies
  - Modified processes and flows
- Dozens of concurrent construction projects
- Training must keep up
  - Traditional training performed operator-to-operator
  - Focus became logsheets rather than knowledge
  - Skills of operators have changed over the years
  - Regulatory requirements are becoming more demanding
Skills Needed

- General process knowledge
- Process interrelatedness
- Troubleshooting
- Written communication
- Verbal communication
- Computer Skills
Written Assessment

Questions Show:
- writing skills
- correct log entry
- proper communication protocol

Disinfection Process Assessment Written Exercise

The condition pictured below is witnessed during a routine walk through the Structure 960 Pipe Gallery.

This condition is observed at frame 42. It is evident that a leak is coming from the one inch orange line which is hidden behind several other lines. The leak has left white powdery residue on other pipes and the ground. There is no marking on the line to identify the contents within 10 feet in either direction.

Write a logbook entry that concisely answers the fundamental questions:
- What?
- When?
- Where? and
- Action taken?

When completed with the logbook entry, log into Maximo and create a work order for this situation.
Field Assessment Questions

Demonstrate Correct Operation of a Task or Piece of Equipment

Notify the 521 operator that you will be making changes to the chemical flow. At a DCS terminal, log in and navigate to the Hypochlorite Feed screen [HYPO_FEED], open the Sec Hypo Flow Control controller, and describe the difference between MANUAL and AUTO, LOCAL and REMOTE. Ensure adequate dechlorination of final effluent (highly negative residuals) and no changes in the secondary effluent flow rate. Perform the following changes:

- Record the current hypo dosing rate in gph and the ratio.
- Increase the hypo dose by 1 gph in MANUAL mode.
- Decrease the hypo dose by 1 gph in AUTO/LOCAL mode.
- Increase the hypo dose by 1 gph in AUTO/REMOTE mode.
- Return all settings to original values.
Oral Assessment Questions

Demonstrate Understanding of Non-Routine Procedures

List the equipment used for dewatering/draining the chlorine contact channels. Where do they discharge and what are the important considerations about the discharge location when dewatering/draining the channel?
Lessons Learned

- No need to videotape SMEs for knowledge capture during development
- Operators are great editors, not writers
- Plant Superintendent is best Champion
- Must have management support
- Work with unions for success
- Proceed without up to date SOPs, O&M manuals
  - Don’t get bogged down
Benefits for Implementing Competency Standards

- Clarity of operator role and responsibility
- Means for accountability
- Consistency across multiple shifts
- Repeatable means for capture and transfer of key knowledge
- Organizational culture shift
  - To a “learning organization”
  - Knowledge Sharing rather than Knowledge Hoarding
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