Non-OEM Rehabilitation of a 17 MGD Packaged Water Filtration Plant
City of Rome, New York

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Outline

• Overview of Rome’s Water System
• Project Goals & Scope of Improvements
• Bringing in a Non-OEM Manufacturer
• Performance Guarantee
• Project Costs
• Project Status
• Takeaway Lessons
• Questions
Description of Water System

City of Rome, New York

- Surface water supply
- Tagasoke Reservoir/Boyd Dam
- Kessinger Diversion Dam
- Raw Water Tunnel
- 48” Raw Water Pipeline
- Frank Clark Water Filtration Plant
- 65MG Open Finished Water Storage
- Future: UV Treatment Facility
- Parallel 30” finished water conduits
Existing Water Filtration Plant

- Constructed in 1987
- Nine pre-engineered packaged treatment units
- Units consist of combination upflow clarifier & high-rate gravity filter
- Total Capacity: 17.1 MGD
- Conventional flocculation & settling added in 1998 to address high color and turbidity

Image Credit: WesTech Engineering, Inc.
Project Goals

- Renewal of the filter media
- Improved filter cleaning
- Replacement of worn equipment
- Reduced downtime for repairs
- Improved access for filter monitoring/maintenance
- SCADA
Rehabilitation as a Complete System

- All equipment directly related to clarifier/filter operation treated as a single system (“Filter System”)
- All work on the Filter System placed under the responsibility of single equipment supplier
- Maintains the responsibility for complete system performance with a single entity
- Simpler resolution of issues during construction and beyond
Scope of Improvements

Filter System Improvements:

- Revise filter backwash cycle to combined air/water backwash (formerly surface wash with upflow fluidization wash)
- New underdrains (combined air/water)
- Replace filter media
  - Same filter media, except graveless
  - Triple media (anthracite, silica sand, garnet sand)
- Add filter-to-waste

Image Credit: Roberts Water Technologies
Scope of Improvements

Filter System Improvements (cont.):

• New P.D. Blowers
• Variable speed drives for existing Backwash Pumps
• Ultrasonic filter level control
• New differential pressure sensors for filter headloss measurement
• Clarifier screen modifications
• New control panel for entire system
Existing Water Filtration Plant
Improved Water Filtration Plant
Scope of Improvements

Other Improvements (separate from Filter System):

• Filter pre-chlorination and backwash chlorination
• Catwalk improvements
• New Blower Room expansion on WFP
• Filter tank painting
• Filter tank insulation
Filter System Manufacturers

- Filter System equipment comprises 40% of total construction cost
- Concerns over lack of competition if work limited to original equipment manufacturer (OEM)
- City decided to allow non-OEM manufacturers to promote competition
Allowing a Non-OEM to Modify the Packaged Filters

- Limit bidders to those with similar equipment (at least two companies provide similar packaged filtration units)
- Specify minimum experience & minimum # of installations
- Be clear in the specifications what equipment is included in the “system”
- Delegate full system responsibility:
  - “A single equipment supplier shall provide the majority of the components of the filter system… and shall have complete system responsibility for the proper coordination, functioning, and performance of the entire system, regardless of the source of individual components.”
- Require a performance guarantee
Performance Guarantee

- Written guarantee certifying that system performance (filter effluent quality) shall meet the specified performance requirements.
- “Should effluent quality fail to meet specified performance requirements at the startup of a filter… the manufacturer shall provide on-site services… and any necessary additional parts, equipment, instrumentation, or control modifications necessary to meet effluent quality requirements on a continuous basis.”
Bid Results

Contract 1 – General:

• Engineer’s Estimate: $5,250,000 (prior to allowing non-OEM)

• Bid Price: $4,130,000

• Competition = $$ saved
Construction Sequencing

- Filters being rehabilitated 2 at a time
- Remaining 7 filters maintained online during construction
- All ancillary equipment needs to be complete before first 2 filters online
- Both old and new systems operating concurrently
  - 2 controls systems
  - 2 pairs of blowers
  - Surface wash vs. air scour
  - Backwash pumps split between old & new control systems
Project Status

• Ancillary equipment installed
• Startup of first pair of filters end of May
• Schedule slip largely due to
  • Cold weather limitations on painting
  • Inefficiencies in constructing first filters
• First pair of filters failed initial underdrain air pattern test
Filter to Waste Air Gap

- Mandatory air gap for FTW discharge to Wastewater Wet Well
- Splashing due to angle of water jet
- Screen on discharge elbow straightened flow
Takeaway Lessons

- Packaged filtration systems may be rehabilitated by non-OEM manufacturers
- Savings from increased competition
- Require a performance guarantee
Questions?

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