

Standard Operating Guideline – Valve Exercising & Maintenance

Standard Operating Guideline (SOG)

Title: **VALVE EXERCISING & MAINTENANCE**

District Name: _____

Date Prepared: _____ Date Revised: _____

OBJECTIVE:

The American Water Works Association (AWWA) recommends that all water utilities initiate a Valve Exercise Program that requires all valves (such as distribution and transmission valves, air valves, and blow-offs) to be inspected and operated on a regular basis. The objective of this SOG is to outline key elements of a comprehensive Valve Exercise Program in order to:

- Help agencies determine the effectiveness of existing Valve Exercise Programs
- Improve the efficiency and productivity of distribution crews
- Improve valve reliability
- Reduce water loss
- Identify critical valves on distribution system
- Measure and document valve operation
- Develop trend analysis

RATIONALE / PURPOSE:

An effective Valve Exercising Program is essential to:

- Improve customer service
- Ensure mission capability
- Ensure distribution system reliability
- Develop predictive maintenance programs
- Determine capital improvement budgeting
- Develop loss trend analysis
- Ensure system isolation capability
- Ensure water quality control

METHODS / PROCEDURES:

According to AWWA, a valve exercising is a procedure that verifies proper location, operation, and material condition of valves, and initiates replacement as necessary. The physical operation of a valve and the documentation of the actions and procedures necessary to do so are equally important. An asset management system may need to be developed to facilitate the Valve Exercise Program.

Standard Operating Guideline – Valve Exercising & Maintenance

The following methods and procedures are recommendations that illustrate methods used by water agencies that have implemented a Valve Exercising Program.

- **Valve Exercising and Maintenance Program Assessment** (AWWA “Water Distribution System Assessment Workbook”):

1. Has a Valve Exercise Program been established?
2. Is there a standard operating procedure (SOP) for valve exercising?
3. Have specific goals been set for the number of valves (of all kinds) to be exercised in a week, month, and year?
4. Are measurements in place to verify exercise goals are met?
5. Is there a capital improvement program for replacement of defective valves?
6. Are valve activation directions standardized, or are valve turning directions (left & right-turn) adequately marked?

- **Procedures/Work Steps:**

The following work steps are recommended:

1. Locate valve.
2. Notify owner (as required).
3. Photograph the location, identifying the condition of the site.
4. Check the area for potential hazards and implement needed controls.
5. Establish traffic control as necessary.
6. Pull cover.
7. Clean riser as necessary to inspect valve.
8. Exercise valve:
 - a. Verify the direction for turning the valve to the **Closed** and **Open** positions.
 - b. Assume valve is in the full **Open** position.
 - c. Begin **Closing Valve Slowly**, increasing torque as necessary to achieve movement (without exceeding the pre-determined *Maximum Torque*).
 - d. Count the number of turns necessary to achieve the full **Open Position**.
 - e. Begin **Opening Valve Slowly**, increasing torque as necessary to achieve movement (without exceeding the pre-determined *Maximum Torque*).
 - f. Count the number of turns necessary to achieve the full **Closed Position**.
 - g. Repeat the Close/Open cycle a minimum of three (3) times, or until the number of turns necessary to open or close the valve does not change.
 - h. Record the number of Turns, Cycles, and Maximum Torque applied.
9. Photograph valve if possible.
10. Record the valve dimensions, condition of the valve, and other pertinent information.

Standard Operating Guideline – Valve Exercising & Maintenance

11. Replace cover.
12. Prior to departing, evaluate the location for hazards to people, property, or environment, record findings.
13. Mitigate any hazards discovered and initiate the actions necessary to eliminate those hazards.
14. Photograph the site.

SAFETY CONSIDERATIONS:

An effective Valve Exercising Program can help to prevent damage to property, environment, and injury to the public and employees by:

- Precluding distribution system damage
- Facilitating emergency response actions
- Facilitating operations and maintenance personnel safety
 - o Identify safe work practices
 - Personal Protective Equipment requirements
 - Lockout/Tagout
 - Confined Space Entry
 - ACP Procedures
 - Traffic control

COST BENEFIT:

- Reduce revenue loss
- System failure prediction would reduce water loss system degradation
- Avoid costly liability and property losses
- Create a manageable capital improvement budget
- Enhance system reliability
- Strengthen customer confidence

INSPECTION FORMS / CHECKLISTS / DOCUMENTATION/ASSETS:

- **VALVE MAINTENANCE REPORT**
 - o District: Mission Springs WD
- **VALVE EXERCISE GUIDELINE**
 - o District: Sacramento Suburban WD
- **PERMANENT VALVE RECORD** (work cards)
 - o District: Bella Vista WD
- **VALVE MAINTENANCE PLAN**
 - o District: Wheeler Ridge-Maricopa WSD

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VALVE EXERCISE EQUIPMENT AND SOFTWARE

- District: Sacramento Suburban WD

- INFRMAP - ASSET MANAGEMENT SOFTWARE

- District: Sweetwater Authority

REFERENCES:

- American Water Works Association “*Manual of Water Supply Practices – Distribution Valves: Selection, Installation, Field Testing, and Maintenance*” (AWWA M44)
- AWWA “*Water Distribution System Assessment Workbook*”
- AWWA Operating Guide to G200 - “*Distribution Systems Operation and Maintenance*”

TESTIMONIALS:

The following benefits were experienced when a detailed Valve Exercising and Maintenance Program had been established: