GUAM WATERWORKS AUTHORITY	STANDARD OPERATING PROCEDURE	No.	SOP-1500-WD-001
		Effective Date	2/10/2025
	Valve Exercising and Maintenance	Final Approver	Miguel C. Bordallo, P.E. General Manager
		Revision Letter	A

1.0 Purpose

This Standard Operating Procedure (SOP) establishes guidelines and procedures for exercising and maintaining valves within the Guam Waterworks Authority's (GWA) distribution system. The valve exercising program helps maintain the lifespan and operation of water system valves.

2.0 Scope

This SOP applies to all employees responsible for maintaining and operating valves in the water distribution system.

3.0 Policy

GWA policy requires valve exercise activities to be performed at least once every 1 to 3 years, with critical valves exercised annually. The frequency should be adjusted based on operational changes to prevent failures and ensure operational efficiency. This policy aligns with the American Water Works Association (AWWA) Manual M44 – Distribution Valves: Selection, Installation Field Testing and Maintenance.

4.0 Definitions

4.1. **American Water Works Association (AWWA):** An international, nonprofit, scientific, and educational society accredited by the American National Standards Institute, dedicated to ensuring safe and reliable water. It sets standards and best practices for water quality, treatment, and distribution.

4.2. **Butterfly Valve:** A valve consisting of a disk rotating on an axis across the diameter of a pipe to regulate or throttle the flow.

4.3. **Cavitation:** The formation and collapse of vapor bubbles (cavities) in the liquid flowing through a valve caused by changes in pressure and velocity. The occurrence of valve cavitation can also be detected in the form of erosion and pitting on valve components, leading to leaks, reduced flow rates, and decreased control accuracy.

4.4. **Critical Valves:** Valves that are operated frequently for system adjustments, supply water into district-metered areas that divide pressure zones, and serve critical services such as hospitals, schools, government buildings, etc.

4.5. **Gate Valve:** A valve with a sliding part that controls the extent of the opening, hole, or gap.

4.6. **Geographic Information System (GIS):** A mapping system that collects, manages, and analyzes spatial data using location-based information. It is a computer system used to create maps and visual representations for capturing, storing, checking, and displaying data related to positions on the Earth's surface.

4.7. **Listening Stick:** A metal rod with an earpiece used to pinpoint the location of a leak.

4.8. **Oracle Computerized Asset Management (CAM) System:** GWA's CAM is used to manage GWA's Operation and Maintenance (O&M) Program tracking both preventive and corrective maintenance actions.

4.9. **Trouble Dispatch Center:** The GWA 24/7 customer complaint response center. The Trouble Dispatch Center is responsible for receiving customer complaints and generating and assigning Work Order requests.

4.10. **Tuberculation:** The development or formation of small mounds of corrosion products (rust) in the water pipes, valves, and other components.

4.11. **Valve Box:** A box or vault (typically of metal or concrete) placed over a valve stem at the ground's surface to allow access for opening and closing the valve and which has a cover located at the ground's surface to keep out dirt and debris.

4.12. **Valve Exercising:** Each valve should be operated through a full cycle and returned to its normal position on a schedule that is designed to prevent a buildup of tuberculation or other deposits that could render the valve inoperable or prevent a tight shut-off.

4.13. **Valve Key:** A T-Head valve/socket wrench used to operate the valve.

4.14. **Valve Information Tracking and Logging System (VITALS):** A software that enables the operator to exercise the valve and record critical valve information (e.g., size, depth, direction and number of turns, maximum torque, and physical location via GPS, etc.). It synchronizes the information between the HC-100 handheld controller to the VITALS desktop database.

4.15. **Water Hammer:** A pressure surge or wave caused when water in motion suddenly stops or changes direction.

4.16. **Water / Wastewater System Control Center (SCC):** GWA's communications hub connecting field personnel with operation and management. GWA's Rovers send and receive data from the field to SCC. Problems, repairs, leaks, overflows, low water pressure, data collection for reservoir, etc. are communicated to SCC for generation of work orders and assignments.

5.0 Roles and Responsibilities

5.1.	General Manager	Approves this SOP and all its subsequent changes.
5.2.	Assistant General Manager for Operations (AGM-O)	Oversees the development, revision, and implementation of this SOP as the Policy Owner.
5.3.	Operations & Maintenance (O&M) Manager, Water Distribution	Reviews this SOP annually and makes necessary changes to be presented to the AGM-O for consideration. Ensures that proper training and/or training guidelines are provided to the affected employees to ensure proper compliance with this SOP.
5.4.	Supervisor, Operation & Maintenance (O&M)	Monitors personnel to ensure compliance with this SOP and provides guidance if needed.

		Uses JDE CAM to assign, track, and manage all preventative maintenance activity. Gathers valve information to identify the location of the valve(s) and asset information. Notifies the SCC 48 hours before planned road closures and ensures the required permits are obtained. At the end of every week, downloads the valve information from the handheld HC-100 controller to the VITALS software. At the end of each month, contacts the GIS Manager to retrieve the data, then uploads to the GIS.
5.5.	Trouble Dispatch Center	Receive information of valve exercising activity and generate Work Order requests. Prepare water outage/road closure alert via Mailchimp and text message based on the information provided by the O&M leader or supervisor. Assign work orders to maintenance personnel and coordinate with the SCC dispatcher for necessary action.
5.6.	Water Wastewater System Control Center (SCC)	Receives critical report or information from GWA maintenance personnel about the operation of GWA facility. Relays the report or information received, and updates and logs all communications received in the SCC records for its reference.
5.7.	Maintenance Personnel	Strictly abide by the contents of this SOP and conduct activities accordingly. When confronted by a situation not covered by this SOP or requiring clarification, seek the manager's or supervisor's assistance.

6.0 Procedure Description

6.1. **Safety Considerations:** Adhere to all safety protocols. Safety briefings are held weekly to discuss these protocols. Use appropriate personal protective equipment (PPE) needed to perform the required work.

6.2. **General Preparation:**

6.2.1. **Schedule and Assignment:** Preventive maintenance (PM) is performed based on various factors, including the manufacturer's recommendations, regulatory requirements, and historical data. The recommended PM is added and entered in the

JDE CAM program to generate a Work Order (WO). The Maintenance Supervisor (Supervisor) shall use the JDE CAM to assign, track, and manage all PM activity[1].

6.2.2. **Data Collection:** The Supervisor will gather valve information, such as Geographic Information System (GIS) mapping, to identify the location of the valve(s) and asset information.

6.2.3. **Road Closures:** If the work requires a road closure, the Supervisor shall notify the Trouble Dispatch Center (Dispatch) 48 hours before the planned road closure[2] and ensure the required permits are obtained.

6.2.4. **High Traffic Areas/Busy Intersections:** Contact Dispatch to request additional traffic control assistance from the Guam Police Department. For further guidance, refer to GWA's traffic control policy[3].

6.2.5. **Valves Located in Vault:** Contact SCC to request assistance from other personnel within the Water Distribution section with confined space entry certification, if vault entry is required.

6.3. **Pre-Departure Preparations:** The following shall be performed prior to departing the station:

6.3.1. Notify the Supervisor or O&M Manager for Water Distribution of the day's scheduled preventive maintenance (PM).

6.3.2. **Vehicle Pre-Departure Checklist:** Conduct a daily inspection of each assigned GWA Official Vehicle and Valve Exercising Trailer using the respective pre-departure checklists **(Attachments 1 and 2)** to ensure that the vehicles are fully functional, ready for use, and stocked with the proper tools and equipment needed to perform the task.

6.4. **Valve Exercising:** Document all work performed and observations made during the inspection and maintenance process in the *Valve Exercising Inspection & Maintenance Checklist* **(Attachment 3)**.

6.4.1. Upon arrival at the site, record the name(s) of maintenance personnel performing the work, inspection date, and arrival time in the WO.

6.4.2. Conduct an initial inspection of the job site for any signs of obstruction, such as overgrown vegetation, abandoned vehicles, or objects. If there are signs of obstruction, determine appropriate actions to be taken.

6.4.3. Set up the appropriate traffic control measures.

6.4.4. Locate the valves to be exercised using probing rods and metal detectors. If the valve cannot be located, label the valve as "cannot locate," "paved over," or "not accessible/restricted area[4]" in the WO.

6.4.5. Once the valve is located, identify the asset ID number for the valve on the map and confirm the actual field location is a correct match. The following information should be recorded in the WO:

[1] See SOP GM-062, *Preventive Maintenance Scheduling & Assignment*.
[2] SOP-1500-WP-001, *Water Outage & Road Closure Notifications to the Media/Public*.
[3] SOP T.103, *Traffic Control Policy*.
[4] These valves are usually located on private residential or commercial property.

6.4.5.1. Asset ID number.

6.4.5.2. Complete address.

6.4.5.3. Global Positioning System (GPS) coordinates.

6.4.5.4. Surface cover (i.e., valve box, vault, box or vault material).

6.4.5.5. Map discrepancies, if any.

6.4.6. Remove the cover/lid to access the valve and confirm if the valve key can be mounted on the operating nut.

6.4.6.1. If the valve cover is tightly stuck, a screwdriver, pry bar, sledgehammer, or other tools may be used. If the cover is damaged while accessing the valve or has a hole in it, it should be replaced using spare parts.

6.4.7. Clean the valve box or vault, removing any debris or water so that the opening nut and bonnet bolts can be seen visually for inspection. Where water is present, industrial vacuum equipment or water pumps capable of de-watering a vault is used. Exercise caution with snakes, spiders, or other potential hazards.

6.4.8. Visually inspect and confirm the valve specifics. Document the following on the WO:

6.4.8.1. Valve type (i.e., gate, butterfly).

6.4.8.2. Function/use (in-line main, hydrant isolation, service line, bypass, sectional, lateral, pressure reducing, etc.).

6.4.8.3. Structure (i.e., valve box, vault).

6.4.8.4. Operating nut depth.

6.4.8.5. Cleaning equipment required (i.e., vacuum, pump).

6.4.9. Once cleaned, inspect the stem and nut for damage or obvious leakage. Record findings in the WO notes section.

6.4.10. After the valve casing is cleaned, exercise the valve.

6.4.10.1. To complement the valve maintenance, it is recommended that it be done in coordination with the hydrant flushing[5].

6.4.10.2. The Supervisor will assess the need for flushing and determine if additional assistance is required. Typically, maintenance personnel will flush the nearby hydrants. However, if valve maintenance leads to road closures, they must stay on-site. The supervisor will contact SCC to request assistance from the WD Rovers.

6.4.11. Identify the current position of the valve in the closed or opened position as found.

[5] Refer to the *Fire Hydrant Flushing and Maintenance* SOP.

6.4.11.1. **Normally Open Valves:** If a valve is operable, close it completely and count the number of full turns[6]. Open the valve all the way.

6.4.11.2. **Normally Closed Valves:**

a. These valves are typically located in pressure zones and should remain closed unless otherwise instructed by the O&M supervisor or manager.

b. Prior to exercising these valves, notify SCC to coordinate additional support from the Pumping Station Operators and Booster Pump Station (BPS) Maintenance Team to assess reservoir levels, deep well discharge pressures, BPS in operation, pressures in the surrounding area, and other distribution system appurtenances that require adjustments.

c. If the valve is operable, open it completely and count the number of turns[6]. Close the valve completely.

6.4.12. The valve should be operated with steady pressure in the pipeline. Slow closure is critical to minimize the potential for operational failure of the valve or water hammer. The valve should function freely with no binding or vibration.

6.4.13. Begin with rotating 5 to 10 rotations, then reverse for 2 or 3 rotations. Reverse again and rotate 5 to 10 more turns in the clockwise/counterclockwise (opening/closing) direction. Repeat this procedure until full closure is obtained. The number of rotations may vary depending on the stiffness of the valve while operating it. If the valve is hard to operate, lessen the number of rotations forward and reverse to slowly free the valve stem and disc.

6.4.14. Accurately count the number of turns to fully close. This will reveal an obstruction if the correct number of turns is not achieved.

6.4.15. Listen closely while rotating the valve key. A flow change may be heard when operating a valve, which will help determine if the valve is moving.

6.4.16. Use a listening stick to determine if water still flows through the valve gate. The valve is closed when sound cannot be heard.

6.4.17. Once the valve is fully closed, it should be opened a few turns so that high-velocity water flowing under the gate can move the remainder of the sediment downstream with more force and clear the bottom part of the valve body for seating.

6.4.18. Restore the area to a clean, safe condition. This includes replacing the valve cover and clearing the area of any traffic control devices.

6.4.19. Document the final condition of the valve, including any comments and observations or items requiring additional maintenance in the WO to close out the WO.

[6] The number of full turns should equal the main size multiplied by 3, plus 2. For example, for an 8-inch valve, this calculation would be 3x8+2 = 26 turns (this is not applicable to butterfly/geared valves). For further guidance on performance standards, refer to the ANSI/AWWA C500-19 *Metal-Seated Gate Valves for Water Supply Service* and C515-20 *Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service*.

6.5. **Troubleshoot Issues and Response Procedures:** If a valve fails to operate properly during exercise or inspection, stop operation and take the following actions:

6.5.1. Determine the current position of the valve (open/partially open/closed/partially closed).

6.5.2. Use effective troubleshooting techniques to determine the cause of the issue.

6.5.3. Use the comprehensive *Troubleshooting Checklist for Valves* **(Attachment 4)** to address and resolve the identified issues thoroughly.

6.5.4. Make necessary repairs. If repairs could not be performed at the time of finding, coordinate and schedule for repairs/replacement.

6.5.5. Contact SCC and the Supervisor to request additional support if needed.

6.5.6. Close out the WO when the work is complete. The following details must be included for each WO:

6.5.6.1. Name of operator.

6.5.6.2. Date and time the work was completed.

6.5.6.3. Scope of work.

6.5.6.4. Size, length, and location of main flushed.

6.5.6.5. Attach photos, if necessary.

6.6. **Repairs:** Repairs may be necessary to address significant damage or malfunctions beyond routine maintenance, such as broken operating nuts, stems, or gates or cavitation of the gate or stem. If repairs cannot be made during maintenance or troubleshooting, a corrective maintenance work order should be created to schedule future repairs or replacements[7].

6.7. **Data Transfer:** All data collected during valve exercising and maintenance is transferred from the HC-100 controller to the VITALS Desktop through a USB flash drive[8].

6.7.1. At the end of every week, the Supervisor shall transfer the data, which includes the locations, notes, GPS coordinates, type of valves exercised, etc.

6.7.1.1. To initiate the data transfer, remove the USB from the handheld HC-100 controller and connect it to the designated desktop computer at the station.

6.7.1.2. Open the VITALS Desktop software and begin the transfer.

6.7.2. At the end of each month, the Supervisor shall contact the GIS Manager to retrieve the data, which is then uploaded to the GIS.

6.8. **Training:** The O&M Manager should conduct training for Valve Exercising and Maintenance when needed. New or relevant employees must receive training and sign the *Employee's*

[7] Always follow the manufacturer's guidelines to ensure proper repair and valve operation.
[8] For further guidance, refer to the *VITALS Reference Manual*.

Acknowledgment Receipt **(Attachment 5)** to confirm their understanding and compliance with the procedures outlined in this SOP.

6.9. **Non-Compliance to this SOP:**

6.9.1. **Employee:** Failure of the employee to adhere and comply with any of the guidelines, policies, and procedures stated herein may result in progressive or adverse disciplinary action, including but not limited to suspension, demotion or termination of employment as provided by GWA Personnel Rules and Regulations (PR&R).

6.9.2. **Supervisors and Managers:** Failure of the Manager or Supervisor to report and enforce all the guidelines, policies, and procedures states herein may result in progressive or adverse disciplinary action, including but not limited to suspension, demotion, or termination of employment as provided by GWA PR&R.

7.0 Document Approvals

Role	Position	Name of Approver	Approval Signature	Date Approved
Authors	O&M Manager, Water Distribution Legal Secretary III	Vincent Pangelinan Antonette Dione Gutierrez	Approval on File	On File
Policy Owner	Assistant General Manager for Operations (AGM-O)	Thomas A. Cruz, P.E.	Approval on File	On File
Final Approver	General Manager	Miguel C. Bordallo, P.E.	Page 1	Page 1

By existing Guam and Federal laws, the contents of this SOP were reviewed thoroughly by its Policy Owner and was found to be:

☒ appropriate for publication on the GWA website without compromising the security of GWA's system or the public's health and safety.

☐ not appropriate for publication on the GWA website because it might jeopardize the security of GWA's system or the public's health and safety.

8.0 Records of Revisions

All suggestions for improvement shall be directed to the Policy Owner indicated below. The Policy Owner will consider input received, develop recommendations on how to address the suggestions and obtain authorization to make the recommended changes. Updates, revisions, corrections and waivers to this SOP shall be made in writing and be approved by the GM.

8.1. Policy Owner: Assistant General Manager of Operations

8.2. Authorization: General Manager

Effective Date	Revision Letter	Document Authors	Description of Change
Page 1	A	Vincent Pangelinan Antonette Dione Gutierrez	Initial Release of SOP

9.0 References

9.1. AWWA Manual M44 – *Distribution Valves: Selection, Installation Field Testing and Maintenance*.

9.2. SOP GM-062, *Preventive Maintenance Scheduling & Assignment*.

9.3. SOP-1500-WP-001, *Water Outage & Road Closure Notifications to the Media/Public*.

9.4. SOP T.103, *Traffic Control Policy*.

9.5. *Fire Hydrant Flushing and Maintenance* SOP.

9.6. ANSI/AWWA C500-19 *Metal-Seated Gate Valves for Water Supply Service*.

9.7. ANSI/AWWA C515-20 *Reduced-Wall Resilient-Seated Gate Valves for Water Supply Service*.

9.8. 2"-12" Resilient Wedge NRS Gate Valves with Flanged Ends | AMERICAN. https://american-usa.com/products/valves-and-hydrants/2-12-series-2500-resilient-wedge-gate-valves/2-12-resilient-wedge-gate-valves-with-flanged-ends/standard-dimensions

9.9. How to exercise valves - Valvemax. https://valvemax.com.au/news/how-to-exercise-valves/

9.10. VITALS Reference Manual.

Attachment 1: GWA Official Vehicle Pre-Departure Checklist

GUAM WATERWORKS AUTHORITY

Gloria B. Nelson Public Service Building
688 Route 15
Mangilao, Guam 96913
vpangelinan@guamwaterworks.org

VALVE EXERCISING & MAINTENANCE
GWA OFFICIAL VEHICLE PRE-DEPARTURE CHECKLIST

OPERATOR 1 (DRIVER): _____
OPERATOR 2 (PASSENGER): _____
SUPERVISOR/MANAGER: _____

DATE: _____
DIVISION _____
CONTACT NO.: _____

VEHICLE HISTORY

YEAR: _____ **MAKE:** _____ **MODEL:** _____ **INS. EXP DATE:** _____
LICENSE PLATE NO.: _____ **REGISTRATION EXP DATE:** _____ **GAS LEVEL:** _____
ODOMETER READING START: _____ END: _____

Body	Good	Fair	Poor
Hood	☐	☐	☐
Grill-Front	☐	☐	☐
Bumper-Front	☐	☐	☐
Bumper-Rear	☐	☐	☐
Fender-Front Left	☐	☐	☐
Fender-Front Right	☐	☐	☐
Tailgate	☐	☐	☐
Door-Driver	☐	☐	☐
Door-Passenger	☐	☐	☐
Mirror-Driver	☐	☐	☐
Mirror-Passenger	☐	☐	☐
Wiper Blades	☐	☐	☐
Wiper Blades	☐	☐	☐

Tires	Good	Fair	Poor
Jack/Tire	☐	☐	☐
Spare Tire	☐	☐	☐
Tire Pressure	☐	☐	☐

Engine	Good	Fair	Poor
Air Filter	☐	☐	☐
Battery	☐	☐	☐
Coolant Radiator	☐	☐	☐
Cap-Radiator	☐	☐	☐
Cap-Oil	☐	☐	☐

Interior	Good	Fair	Poor
Horn	☐	☐	☐
Parking Brakes	☐	☐	☐
Interior Light	☐	☐	☐
Interior Gauges	☐	☐	☐
Air Condition	☐	☐	☐
Cleanliness	☐	☐	☐
Interior Lighting	☐	☐	☐

Lights	Good	Fair	Poor
Front Hazard	☐	☐	☐
Front Signal	☐	☐	☐
Headlamps High	☐	☐	☐
Headlamps Low	☐	☐	☐
Rear Hazards	☐	☐	☐
Rear Left Brake	☐	☐	☐
Rear Right Brake	☐	☐	☐
Rear Signal	☐	☐	☐

Glass	Good	Fair	Poor
Windshield	☐	☐	☐
Back Glass	☐	☐	☐
D Window	☐	☐	☐
PD Window	☐	☐	☐

Fluid Levels	High	Normal	Low
Oil Dipstick	☐	☐	☐
Oil	☐	☐	☐
Brake Fluid	☐	☐	☐
Power Steering	☐	☐	☐

Tools & Equip	Avail.	Replace	Replenish
Safety Vest	☐	☐	☐
Hard Hat	☐	☐	☐
Safety Gloves	☐	☐	☐
Valve Key	☐	☐	☐
Valve Box Key All Sizes	☐	☐	☐
Screw Driver	☐	☐	☐
Probing Rods or Metal Detector	☐	☐	☐
Pry Bar	☐	☐	☐
Tape Measurer (25' and 100')	☐	☐	☐
Shovel	☐	☐	☐
Listening Stick	☐	☐	☐
WACHS Handheld HC-100 Controller	☐	☐	☐
Manhole Hooks	☐	☐	☐

REMARKS: _____

EMPLOYEE NAME: _____ SIGNATURE: _____ DATE: _____

SUPERVISOR/ MANAGER: _____ SIGNATURE: _____ DATE: _____

Attachment 2: Valve Exercising Trailer Pre-Departure Checklist

GUAM WATERWORKS AUTHORITY

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VALVE EXERCISING & MAINTENANCE
VALVE EXERCISING TRAILER PRE-DEPARTURE CHECKLIST

OPERATOR 1 (DRIVER): _____
OPERATOR 2 (PASSENGER): _____
SUPERVISOR: _____

DATE: _____
DIVISION _____
CONTACT NO.: _____

TRAILER HISTORY

LICENSE PLATE NO.: _____ **REGISTRATION EXP DATE:** _____

TIRES	Good	Fair	Poor
Condition	☐	☐	☐
Tire Pressure	☐	☐	☐
Wheel Lug Nuts	☐	☐	☐

FLUID LEVELS	Good	Fair	Poor
Fuel Level	☐	☐	☐
Water Level	☐	☐	☐
Hydraulic Fluid	☐	☐	☐

LIGHTS	Good	Fair	Poor
Emergency	☐	☐	☐
Beacon	☐	☐	☐
L Brake Light	☐	☐	☐
R Brake Light	☐	☐	☐
L Turn Signal	☐	☐	☐
R Turn Signal	☐	☐	☐
Hazard Lights	☐	☐	☐
Emergency	☐	☐	☐
Brake Cable	☐	☐	☐
Trailer Hitch	☐	☐	☐

EQUIPMENT	Good	Fair	Poor
Hydraulic Hose Reel	☐	☐	☐
Hose Reel	☐	☐	☐
Vacuum Hose	☐	☐	☐
Vacuum Hose Fittings	☐	☐	☐
Valve Ex. Sockets	☐	☐	☐

CONTROL PANELS	OPERABLE	
Main Control Panel	☐ YES	☐ NO
Hydraulic Panel	☐ YES	☐ NO

REMARKS: _____

EMPLOYEE NAME: _____ SIGNATURE: _____ DATE: _____

SUPERVISOR / MANAGER NAME: _____ SIGNATURE: _____ DATE: _____

Attachment 3: Valve Exercising Inspection & Maintenance Checklist

GUAM WATERWORKS AUTHORITY

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VALVE EXERCISING & MAINTENANCE
VALVE EXERCISING INSPECTION & MAINTENANCE CHECKLIST

WTR Syst.Valves Exercise 1M

Work Order No	Failure Description	
1355767	WTR SYST.VALVES EXERCISE 1M	3

Division	Description & Unit Number	Start Date
1520	Water System Valve - WSV-05813 (WSV-05813)	03/31/2023

Description			
Notify SCC: PM is occurring.	○ PASS	○ FAILED	○ SKIP
Notify Ops: PM is occurring.	○ PASS	○ FAILED	○ SKIP
Review safety procedures.	○ PASS	○ FAILED	○ SKIP
Obtain proper PPE's.	○ PASS	○ FAILED	○ SKIP
Check the valve.	○ PASS	○ FAILED	○ SKIP
Inspect for damages.	○ PASS	○ FAILED	○ SKIP
Inspect for deterioration.	○ PASS	○ FAILED	○ SKIP
Inspect for leaks.	○ PASS	○ FAILED	○ SKIP
Repair small leaks(if any).	○ PASS	○ FAILED	○ SKIP
Exercise valve.	○ PASS	○ FAILED	○ SKIP
Open & close valve.	○ PASS	○ FAILED	○ SKIP
Ensure it is working well.	○ PASS	○ FAILED	○ SKIP
Paint if needed.	○ PASS	○ FAILED	○ SKIP

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Attachment 3: Valve Exercising Inspection & Maintenance Checklist (Cont.)

WTR Syst.Valves Exercise 1M

Work Order No	Failure Description	
1355767	WTR SYST.VALVES EXERCISE 1M	3

Division	Description & Unit Number	Start Date
1520	Water System Valve - WSV-05813 (WSV-05813)	03/31/2023

Description			
Repair small leaks(if any).	○ PASS	○ FAILED	○ SKIP
Exercise valve.	○ PASS	○ FAILED	○ SKIP
Open & close valve.	○ PASS	○ FAILED	○ SKIP
Ensure it is working well.	○ PASS	○ FAILED	○ SKIP
Paint if needed.	○ PASS	○ FAILED	○ SKIP
Clean valve.	○ PASS	○ FAILED	○ SKIP
Clean surrounding area.	○ PASS	○ FAILED	○ SKIP
Summarize any defects found.	○ PASS	○ FAILED	○ SKIP
Request CM. If defects is big.	○ PASS	○ FAILED	○ SKIP
Record PM in CMMS.	○ PASS	○ FAILED	○ SKIP
Secure any items & Site.	○ PASS	○ FAILED	○ SKIP
Notify SCC: PM has concluded.	○ PASS	○ FAILED	○ SKIP
Notify Ops: PM has concluded.	○ PASS	○ FAILED	○ SKIP

SUBMIT

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Attachment 4: Troubleshooting Checklist for Valves

GUAM WATERWORKS AUTHORITY

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Mangilao, Guam 96913
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VALVE EXERCISING & MAINTENANCE
TROUBLESHOOTING CHECKLIST FOR VALVES

CONDITION	PROBABLE CAUSE	REMEDY
When closing the valve, you do not achieve the proper number of turns.	1. Tuberculation/Debris may have built up in the seat area, particularly in the double disc valve.	1. Create flow through the valve. - Open a nearby downstream hydrant. 2. Exercise the valve to loosen/remove the debris.
The operating nut continues to rotate even after you have reached the proper number of turns.	1. The valve may be larger than shown on the plans. 2. Excessive torque might have been applied to the operating nut, potentially damaging the stem or stem nut.	1. Continue to operate based on the next size valve. The valve may have a bevel or spur gear to help during operation. - Check the plans to see if a gear was installed on the valve. 2. Expose the valve and inspect the stem and stem nut.
The operating nut is unable to turn in either direction.	1. The valve box may be interfering with the operating key. 2. Debris/corrosion may have built up between the stem due to lack of operation or gritty backfill. 3. Debris could be wedged under the disc.	1. Look at the valve box to check if it is too close to the operating nut. Reposition if necessary. 2. Clean the stem. 3. Perform the following tasks: - Expose the valve. - Clean out the debris.
The gate valve will not pass a pressure test.	1. The valve might be open. 2. The disc may have been closed on top of some debris. 3. Air may be trapped in the line.	1. Be sure the valve is completely closed. - Count the number of turns. 2. Create flow through the valve. - Open a nearby downstream hydrant. - Exercise the valve to loosen or remove any debris. 3. Flush the line to remove the trapped air. Add an Air release valve if necessary.
Valves found closed.	1. Valves found in the closed position is usually identified in the field.	1. Notify the Manager immediately. - Leave the valve in the same position found until a decision is made to operate and what position to leave it in.
Bypass valves (16" and larger double disc gate valves will typically have an associated bypass valve).	1. The bypass valves will be exercised before the main valve is exercised.	1. If the bypass valve is inoperable (e.g., spins free, frozen) crew is to exercise the main valve ¾ of the expected turns and note this in the WO.

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Attachment 4: Troubleshooting Checklist for Valves (Cont.)

CONDITION	PROBABLE CAUSE	REMEDY
Stuck/inoperable valve.	1. The valve hasn't been operating for a long period of time. Built up sediment inside the valve.	1. Increase torque and attempt to rehabilitate valve into working condition (at the risk of breaking valve). - 4-in (crew limit is 200 ft-lbs). - 6-12in (crew limit is 300 ft-lbs). - 16-in & larger (crew limit is 500 ft-lbs) Butterfly (crew limit is 200 ft-lbs turn and count only – hand turn).
Packing leaks.	1. Several pacing leaks will be found in the field.	1. Stop the leak by "snugging" the valve up to the packing gland. Valves that are "snugged up" to stop a packing leak will be documented in the WO because these valves may take more torque to shut after they have been "snugged up."
Map discrepancies.	1. Found valves are not on the map. 2. Valves with turn/size conflicts. 3. Street name changes. 4. Other.	1-4. Document information on the WO and update asset attribute data in GIS.

Attachment 5: Employee's Acknowledgment Receipt

GUAM WATERWORKS AUTHORITY

Gloria B. Nelson Public Service Building
688 Route 15
Mangilao, Guam 96913
vpangelinan@guamwaterworks.org

VALVE EXERCISING & MAINTENANCE
EMPLOYEE'S ACKNOWLEDGMENT RECEIPT

I, the undersigned, an employee of the Guam Waterworks Authority, hereby acknowledge receipt of SOP-1500-WD-001 entitled "*Valve Exercising and Maintenance*" this _____ day of _____, 20____.

Employee's Name/Badge No.:	Employee's Signature:	Date:

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