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Continuing Education Course #453
Reducing Water Loss in Distribution Systems

1. Which is the main purpose of a water distribution system?
 - a. Fill water towers
 - b. Transfer raw water to a WTP
 - c. Transfer potable water to customers
2. Which is NOT a reason that water loss is a growing concern?
 - a. Use of bottled water
 - b. Aging infrastructure
 - c. Scarcity of water sources
3. Which is NOT a common approach for water loss control?
 - a. DMAs
 - b. Recirculation
 - c. Pressure management
4. Which is a definition of water loss?
 - a. Unbilled, unmetered water use
 - b. Unauthorized consumption
 - c. Supplied water that does not reach authorized users
5. Which is the most common cause of water loss?
 - a. Pipe leakage
 - b. Tank overflows
 - c. Meter inaccuracies
6. What is a water balance?
 - a. Raw water versus water supplied
 - b. Breakdown of authorized consumption
 - c. Breakdown of water consumption and loss
7. What units can be used for a water balance?
 - a. Mass or Volume
 - b. Volume or Flow
 - c. Pressure or Flow
8. Which is a correct equation for water loss?
 - a. Water Loss = Non-revenue Water - Unauthorized Consumption
 - b. Water Loss = Water Supplied – Billed Authorized – Unbilled Authorized
 - c. Water Loss = Leakage + Unbilled Authorized

9. What category is pipe flushing?
- a. Apparent losses
 - b. Unauthorized
 - c. Authorized
10. What category is storage tank losses?
- a. Real losses
 - b. Apparent Losses
 - c. Authorized
11. How does non-revenue water (NRW) compare to water losses?
- a. $NRW > \text{Water Loss}$
 - b. $NRW < \text{Water Loss}$
12. What can cause diurnal water loss plots to be misleading?
- a. Stormwater events
 - b. Billing frequency
 - c. Storage tanks
13. Which is NOT a purpose of a water audit?
- a. Benchmarking
 - b. Set rates
 - c. Water balance
14. Which is the most common water audit software?
- a. AWWA Free Water Audit Software
 - b. ASTM Audit Plus
 - c. NFPA Auditorito
15. Which can affect the scoring of data validity?
- a. Leak detection technique
 - b. System pressure
 - c. Meter calibration frequency
16. Which is an example of water loss control planning?
- a. Target-setting
 - b. Target practice
 - c. Thermography
17. Which approach is the AWWA Free Water Audit Software?
- a. Bottom-up
 - b. Top-down
 - c. Center
18. Which is an example of the bottom-up approach to auditing?
- a. Desktop audit
 - b. Benchmarking
 - c. Accuracy tests for meters
19. Which is a basic performance indicator?
- a. Percent water loss
 - b. ILI

- c. CARL
20. Which is a key performance indicator?
- a. Percent NRW
 - b. Percent billed
 - c. ILI
21. Which is a category of Apparent Losses?
- a. Unbilled unmetered
 - b. Meter inaccuracies
 - c. Leakage on Mains
22. Which is a category of Real Losses?
- a. Unbilled unmetered
 - b. Meter inaccuracies
 - c. Leakage on Mains
23. Which elevation is most likely to have high water pressure?
- a. High elevation
 - b. Normal elevation
 - c. Low elevation
24. Which is required for creating DMAs?
- a. Pressure sensors
 - b. Flow meters
 - c. Leak detectors
25. Which is the most common leak detection technique?
- a. Acoustic
 - b. Tracer Gas
 - c. GPR

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