

**PENNSYLVANIA
PUBLIC UTILITY COMMISSION
Harrisburg, PA 17105-3265**

Public Meeting held November 10, 2022

Commissioners Present:

Gladys Brown Dutrieuille, Chairman
Stephen M. DeFrank, Vice Chairman
Ralph V. Yanora
Kathryn L. Zerfuss
John F. Coleman, Jr.

Policy Statement on Public and Private Fire
Protection

M-2022-3033054

PROPOSED POLICY STATEMENT ORDER

BY THE COMMISSION:

On June 16, 2022, the Pennsylvania Public Utility Commission (PUC) by Motion of Commissioner Ralph V. Yanora, directed the Bureau of Technical Utility Services, in conjunction with the Law Bureau, to prepare a Proposed Policy Statement addressing public and private fire protection for consideration at a Public Meeting.

BACKGROUND

The fire protection role of the Commonwealth's regulated water public utilities is a matter of utmost public importance. Ensuring that regulated fire protection service offerings are safe, reasonable, and adequate is likewise a matter of utmost concern to the PUC. Public and private fire protection services, whether serving the ubiquitous roadside fire hydrant or sophisticated private commercial sprinkler system, are expected to supply adequate water safely, reliably, and immediately upon demand.

Amendments to the Commonwealth of Pennsylvania’s (Commonwealth) Uniform Construction Code¹ over the past several decades have expanded the topic of fire protection to aspects of regulated water public utility service well beyond the provision of adequate numbers of functional fire hydrants. Internal fire protection services in the form of sprinkler systems have long been a requirement for commercial and industrial buildings. Municipal building codes and insurance requirements also increasingly mandate the installation of sprinkler systems in various types of residential construction as well. Lives and property depend on these emergency systems to work at a moment’s notice. In turn, sophisticated water distribution system design, construction, management, and operations are required to accommodate and serve this type of high-volume instantaneous demand.

On June 29, 2022, the PUC issued a Secretarial Letter seeking comment from Class A water companies on the proposed policy statement. The PUC sought input on two areas specifically: (1) the use of hydraulic distribution system modeling required for fire protection; and (2) fire protection service afforded by current system design requirements.

Comments were filed by Columbia Water Company (Columbia), the National Association of Water Companies – Pennsylvania Chapter (NAWC), and Aqua Pennsylvania (Aqua).

¹ The Act of Nov. 10, 1999 (P.L. 491, No. 45) (35 P.S. §§ 7210.101–7210.1103), known as the Pennsylvania Construction Code Act (PCCA). The PCCA directed the Pennsylvania Department of Labor and Industry to oversee statewide application and periodic review of certain international building and mechanical codes (i.e., regulations) known collectively as the Uniform Construction Code, 34 Pa. Code §§ 401-405, (PaUCC), last amended effective February 2022. 52 Pa.B. 971. See also National Fire Protection Association (NFPA) 13, Section 8.2.6.6.4 (2022).

Comments of Columbia Water Company

Columbia requests that if the PUC moves forward with a policy statement that it allow Class A water utilities the opportunity for comment on a draft policy statement prior to promulgation. Columbia asserts that the PUC should recognize that customers of smaller Class A utilities will bear greater costs to come into compliance with such policy statement and that smaller distribution systems will likely face more significant impacts. Further, Columbia believes it is imperative for the PUC to be transparent to ratepayers that the costs for upgrades to utility infrastructure will fall on ratepayers. Columbia asserts that the PUC should not be developing quantitative standards but, rather, should recognize there is not a one-size fits all standard for these issues. Finally, Columbia requests that the PUC ensure that the policy does not conflict with PUC-approved utility tariffs and does not create conflicting standards. P. 2-3.

Columbia is in the initial stages of updating its hydraulic model using Bentley's WaterGEMS software and will use an engineering consulting firm to update its model which update is expected to take more than 18 weeks. The initial update to the model will cost \$68,000 and Columbia estimates that use of the model for ongoing fire protection purposes would require the model to be updated on a quarterly basis at an estimated cost of \$15,000-\$20,0000 annually. P. 5-6.

Columbia requests that the PUC not issue "standards" for flow, pressure, or duration of flow and pressure as providing any quantified standard will lead to confusion and appear more like a binding norm than a true statement of policy. Additionally, Columbia cautions that a PUC "standard" would likely conflict with other existing guidance such as PWS, municipal ordinances, or other existing guidance. Further, Columbia asserts that there is not one flow/pressure/duration that is universally acceptable and there could be unintended consequences of specifying minimum flows such as negative impacts on the quality of water. P. 8.

Columbia explains that the International Organization for Standardization (ISO) already evaluates each community and gives it a rating as to fire protection connections. As such, Columbia asserts that the PUC does not need to issue any guidance on this topic. Columbia further explains that new water systems expansions and extensions could be designed and built to a given fire protection standard but that such changes would need to occur over time and be phased. For existing water utility customers, it would be costly and disruptive to go back and redesign/resize entire systems. Further, enacting new standards may prevent some troubled municipal systems from being acquired due to cost barriers. P. 9-10.

Finally, Columbia states that implementing and coming into compliance with new “standards” for fire protection will significantly impact revenue requirements for years to come. Specifically, compliance with policy statement standards will significantly increase the costs of service for public fire protection, but the municipality that pays for such protection can only be charged 25% of the cost to serve, leaving the rest of the revenue requirement for other ratepayers to bear, including residential ratepayers. P. 10- 12.

Comments of NAWC

NAWC explains that several computerized hydraulic models are widely used in the water industry, including Bentley WaterGEMS and EPANET. NAWC asserts that several of these software packages are comparable, accurate and use similar calculation engines so a water utility should be permitted to choose the one that best suits its needs. NAWC further asserts that water utilities should use hydraulic models in conjunction with other tools, such as asset management tools and criticality studies. P. 3.

NAWC states that the timeframes for developing a computerized hydraulic model vary considerably and could range from two months or less for a small system to over a year for a large system. NAWC asserts that the cost to calibrate a hydraulic model

ranges from approximately \$46,000 for a system with about 1,500 service connections to almost \$81,000 for a system with over 10,000 service connections. For many small systems, NAWC questions whether the benefits of a computerized hydraulic model justify the resources required to build, calibrate and maintain the model. Although much of the cost of a hydraulic model is for the development of the original model, NAWC asserts that periodic reviews and updates are required. P. 4-5.

NAWC also questions whether the PUC can establish any “standards” for the provision of regulated public fire protection service through a statement of policy which does not have the force and effect of law. NAWC requests that, if the PUC proposes changes in service conditions and management performance, water utilities will have greater revenue requirements, there will be cost implications for main replacement, storage requirements, and pumping requirements. P. 6-8.

Aqua Pennsylvania Comments

Aqua asserts that hydraulic models should not be the only tool utilized and that they should be used in conjunction with field flow tests and pressure monitoring. Aqua currently maintains 20 hydraulic models out of 114 systems. In order to collect data and build and calibrate the remaining models Aqua would need five years. Additional resources would be needed to shorten this time frame. In addition, the utility would need an additional full-time employee to maintain the hydraulic models going forward to ensure that they remain a useful tool. Aqua explains that the models require routine maintenance and calibration. P. 2-3.

Aqua submits that public water utilities should adhere to the following standards: (1) the removal, replacement or making of those hydrants not providing 500 gallons per minute at 20 pounds per square inch for 20 minutes; (2) the application of applied design standards of the Pennsylvania Department of Environmental Protection or the State Insurance Services Office as required by the Commission; (3) utilization of the AWWA

National Fire Association and International Fire Code by the International Code Council for design points and data references; and (4) collaborative fire protection accountability between water utility, municipality and municipal fire official. Aqua is opposed to mandated fire hydrant markings and believes water utilities should adhere to the standard of 500 gpm at 20 psi for 20 minutes for every hydrant in service. P. 3-4.

Aqua submits that implementation of any new policies concerning minimum expectations for fire protection facilities reside with developers and municipalities. Aqua further explains that if significant changes related to fire protection were to be implemented, then all customers would bear a portion of those costs as, in the case of public hydrants, Section 1328 of the Public Utility Code limits the amount charged to a municipality for hydrants to 25% of the cost of service, while, in the case of private hydrants, the specific customers where those private hydrants serve would bear those costs. P. 5-6.

DISCUSSION

The PUC is of the opinion that it should take an affirmative role in the coordination of the fire protection aspect of regulated water public utility service for the accommodation, convenience, and safety of the public. Outlining the guidelines under which regulated fire protection services are offered to the public represents a worthwhile investment of effort and resources on the part of regulated utilities and the PUC. However, the resources invested should focus on a cooperative stakeholder effort to develop uniform guidelines for the provision of safe, reasonable, and adequate fire protection service rather than merely requiring reports on the status of how the individual water public utilities offer fire protection services to the public.

To foster the development of transparent and readily available fire protection guidelines, the PUC is proposing the Policy Statement appended to this Order as Annex A. Overall, the Proposed Policy Statement is designed to reflect a best practices

approach to those aspects of fire protection services subject to PUC oversight. While fire protection services are often provided by Class A public water utilities, all regulated water public utilities will benefit from a clear understanding of up-to-date guidelines regarding fire protection service. Further, the coordination and consistent application of safe, adequate, and reliable fire protection service offers a tremendous benefit to public safety, emergency fire protection organizations, and associated personnel.

Hydraulic Distribution System Modeling Required for Fire Protection

The PUC expects Class A water public utilities to operate with a sophisticated level of technical expertise, which includes using modern water industry tools such as computerized hydraulic modeling software. A computerized hydraulic model of a distribution system empowers public utility management to understand system operating parameters and components with both accuracy and precision. This includes forecasting system behavior under the operating conditions imposed by the instantaneous demand requirements of fire protection. Further, a computerized hydraulic model can and should be a key component, along with maintenance and other system data, in decision making for capital expenditures to maximize system reliability for fire protection services offered to the public. Regarding the computerized hydraulic modeling useful for that purpose, the PUC seeks input from stakeholders on the following:

What are the most effective methodologies/computerized hydraulic models that are currently used by water public utilities to implement a computerized hydraulic model of water distributions systems? Which are most effective for the modeling of system requirements related to fire protection service?

Based upon a concerted effort, what is a reasonable timeframe and the estimated incremental one-time and ongoing expenditures for a public

water utility to identify all the system facilities and water main data required to develop such a computerized hydraulic model?

What are the expected ongoing maintenance requirements for existing models? Are these models a one-and-done investment, or are they subject to ongoing incremental costs owing to updates?

Fire Protection Service Afforded by Current System Design Requirements

While the PUC does not currently have a policy statement specific to the provision of regulated fire protection service, the Pennsylvania Department of Environmental Protection (DEP) has established some system design requirements to serve fire protection service in its Public Water Supply Manual – Part II, Community System Design Standards, effective May 6, 2006 (PWS Manual)². The PWS Manual’s *Section VIII. Distribution Systems, B.3. Fire Protection*, indicates that “[w]hen fire protection is to be provided, system design should be such that fire flows and facilities are in accordance with the requirements of the State Insurance Services Office.” The PWS Manual’s *Section VIII, D. Hydrants*, outlines specific guidelines for hydrants including location and spacing, hydrant valves and nozzles, hydrant leads, and hydrant drainage.

While the PUC will not replicate the design standards of DEP or the State Insurance Services Office, it will consider whether and how Class A water providers have interpreted and applied these design standards in terms of the actual fire protection services provided to the public. That is, the aspect of fire protection service within the exclusive sphere of PUC jurisdiction rather than that of DEP or the State Insurance

² [www.depgreenport.state.pa.us/elibrary/GetDocument?docId=1419665&DocName=PUBLIC WATER SUPPLY MANUAL - PART II COMMUNITY SYSTEM DESIGN STANDARDS.PDF](http://www.depgreenport.state.pa.us/elibrary/GetDocument?docId=1419665&DocName=PUBLIC%20WATER%20SUPPLY%20MANUAL%20-%20PART%20II%20COMMUNITY%20SYSTEM%20DESIGN%20STANDARDS.PDF) AS OF APRIL 12%2C 2014%2C THE AQUIFER TESTING GUIDELINES WITHIN THIS MANUAL ARE REPLACED BY <%2Fspan>

Services office. The PUC requests that stakeholders provide input regarding the uniformity of these interpretations and how public utility application of these standards has shaped public expectations regarding fire protection service including:

What guidelines should water public utilities attain for the provision of regulated public fire protection service including flow, pressure, and duration of flow and pressure?

What costs and timeframes might the public expect to improve or upgrade facilities not now providing public fire protection service in accordance with DEP or State Insurance Services Office requirements?

What procedures should a public fire service provider employ should a fire protection connection not meet minimum requirements? For example, what customer notifications or public/private fire hydrant markings would be effective to denote expected levels of service from any fire protection facility?

Whether new policies concerning minimum expectations should be implemented differently for new as compared to existing fire protection facilities, public and/or private fire hydrants, private fire protection connections other than private fire hydrants (for example, sprinkler systems), etc.?

What potential adjustments to revenue requirement, cost allocation, and rate design would fire service providers require to accurately and reasonably reflect proposed changes in service conditions and management performance?

PROPOSED POLICY STATEMENT

In accordance with the discussion above and for the reasons expressed, the PUC is proposing the Policy Statement as set forth in Annex A to this Order. Initially, the PUC proposes a section setting forth the scope and purpose of the proposed Policy Statement. This proposed section is intended to convey the scope of the expected actions and level of public fire protection service and system hydraulic monitoring that the PUC considers reasonable. Specifically, we propose the following statement of scope and purpose:

§ 69.xx1. General Scope and Purpose.

(a) All water public utilities.

The coordination and consistent application of safe, adequate, and reliable fire protection service offers a tremendous benefit to public safety, emergency fire protection organizations, and associated personnel. Safe, reasonable, and adequate regulated fire protection service offerings are a matter of utmost concern to the Commission. The policies and recommendations in this Policy Statement are intended to provide water public utilities with a guideline of the recommended actions and level of public fire protection service and system hydraulic monitoring that the Commission considers reasonable. The Commission will consider a water public utility's effort to meet the recommendations in this Policy Statement when determining just and reasonable rates for the water public utility.

(b) Class A water public utilities.

Fire protection services are often provided by Class A public water utilities. Class A water public utilities should operate with a sophisticated level of technical expertise including the use of modern water industry tools such as computerized hydraulic modeling software.

The PUC proposes the following definitions to provide clarity and understanding to the Proposed Policy Statement:

§ 69.xx2. Definitions.

The following words and terms, when used in this section, have the following meanings, unless the context clearly indicates otherwise:

Class A water public utility—as defined in Section 56.2 of the Commission's regulations at 52 Pa. Code § 56.2.

Computerized Hydraulic Model—a computer-based mathematical simulation used to predict the performance of a water system.

Discrete system—A stand-alone pipe network with boundaries that encompass all sources of water and endpoints.

The PUC proposes the following guidance regarding operating procedures:

§ 69.xx3. Fire Protection Service Afforded by Current System Design.

(a) A water public utility’s operating procedures and best practices related to fire protection services, including fire protection connections and public and private fire hydrant service, should be maintained within this Commonwealth at an office or offices of the public utility located in the territory served by it and should be open for examination by the Commission.

(b) A water public utility’s operating procedures and best practices related to fire protection service should include all of the following:

(1) A determination, based on a definable basis or standard or both, of operating characteristics such as minimum flow, pressure, and duration of flow and pressure that the water public utility will consider as its minimum parameters for fire protection connections and public and private fire hydrant service. These predetermined minimum operating characteristics should be applied to all fire protection connections and fire hydrants of a water public utility.

(2) A fire hydrant testing and maintenance program to ensure that all public and private fire hydrants within a discrete system are tested and exercised on a specified schedule as determined operationally and economically feasible by the water public utility.

(3) A method to clearly mark and identify each fire hydrant and each fire protection connection found to be incapable of providing service at the water public utility’s minimum operating characteristics for fire protection connections and fire hydrant service.

(4) An estimated schedule to remove, remediate, or replace a fire hydrant or fire service connection found to be incapable of providing service at the water public utility’s minimum parameters for fire protection connections and fire hydrant service.

(5) An analysis of the level of capital expenditures and associated timeframes for a water public utility to remediate, repair, or both a water system, as part of an acquisition due diligence process, required to bring the fire protection service up to at least the water public utility’s acceptable operating characteristics.

(6) A written notification process to affected customers and local jurisdictions that may include property owners, the municipality and the local fire department of the location of any fire protection connection of fire hydrant that cannot meet the water public utility's acceptable operating characteristics.

(c) In conjunction with its obligations under 52 Pa. Code § 65.4 (relating to records), a water public utility that provides fire protection connections and fire hydrant service should update its maps, plans, and records to include the location of and, if feasible, the last known operating characteristics of all public and private fire hydrants.

The PUC proposes the following guidance as to the use of computerized hydraulic modeling:

§ 69.xx4. Hydraulic Distribution System Modeling Required for Fire Protection.

(a) Hydraulic Distribution System Modeling is a valuable aide in forecasting system capabilities under varying operational conditions.

(b) Class A water public utilities should develop and implement a plan to use and maintain computerized hydraulic models for each discrete water system.

(c) The plan should address all of the following:

(1) A determination of the minimum water system size, based upon the complexity of the distribution pipe network and water service requirements, that should have a model.

(2) An identification of the commercially available hydraulic modeling software to be used.

(3) A description of how data from the public utility's other informational databases and systems, can be integrated into the computerized hydraulic model, including geographic information, supervisory control and data acquisition, and customer information systems.

(4) A schedule by which the computerized hydraulic model will be calibrated, updated, and maintained to ensure the accuracy is sufficient to reasonably predict a system's operational behavior to a determined level of accuracy set by the water public utility.

CONCLUSION

With this Order, the PUC is proposing guidance for ensuring that regulated fire protection service offerings by Class A water public utilities are safe, reasonable, and adequate. The PUC welcomes written comments and written reply comments on all aspects of this Proposed Policy Statement; **THEREFORE,**

IT IS ORDERED:

1. That the proposed Policy Statement set forth in Annex A is issued for comment.
2. That a copy of this Order and Annex A be served on all jurisdictional water public utilities, the Office of the Consumer Advocate, the Office of Small Business Advocate, and the PUC's Bureau of Investigation and Enforcement.
3. That the Law Bureau shall submit this Order and Annex A to the Governor's Budget Office for review of fiscal impact.
4. That the Law Bureau shall deposit this Order and Annex A with the Legislative Reference Bureau for publication in the *Pennsylvania Bulletin*.
5. That written comments may be filed during the 45 days following the date of publication of this proposed Policy Statement in the *Pennsylvania Bulletin* and must reference Docket No. M-2022-3033054.
6. That written reply comments may be filed during the 15 days following the close of the comment period and must reference Docket No. M-2022-3033054.

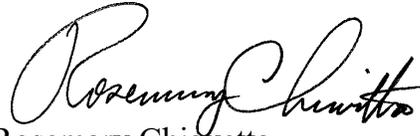
7. That the written comments and written reply comments may be filed using the eFiling system of the Pennsylvania Public Utility Commission. *See* <https://www.puc.pa.gov/filing-resources/efiling/> for eFiling instructions. Alternatively, the written comments and written reply comments may be filed in hard copy by transmitting them to:

Pennsylvania Public Utility Commission,
Attn: Secretary Rosemary Chiavetta,
Commonwealth Keystone Building,
400 North Street, Second Floor
Harrisburg, Pennsylvania 17120.

8. That the contact persons for this matter are Stephanie A. Wilson, Assistant Counsel, Law Bureau, (717) 787-1859, stepwilson@pa.gov; James A. Mullins, Assistant Counsel, Law Bureau, (717) 787-5978, jamullins@pa.gov and Karen Thorne, Regulatory Review Assistant, Law Bureau, kathorne@pa.gov. Parties shall email electronic copies in Microsoft Word®-compatible format of their filings at this docket to these contact persons.

9. That public documents related to this proposed Policy Statement may be viewed and downloaded from the Pennsylvania Public Utility Commission's website at <https://www.puc.pa.gov/search/document-search/?DocketNumber=3033054&ufprt=0171640C719E114B425F16473C19B3BABF414C73A13B7C1E532355E44AD1157EF4467E6D41BF913FE09285B541000A104F5355793318FC14D2EBEAE29F37AE5E04399809A668E035E73E93C948B1269FDAC00979BDCBA5AA000744DE7899C4F6D2E3FF1CCC7289B40085484005500C7F8FCF80B4AD2BFBF7D2C3099EFEA8381EAECF2A025417D2ECB1919C718E7FC6411381D63CBEC7F070A50E29BB7734E9BB67D2038F6CE7718251FF45B1454E2E0275AC9A85AE9D73ADA510A2839C83A5B3#search-results>.

BY THE COMMISSION



Rosemary Chiavetta
Secretary

(SEAL)

ORDER ADOPTED: November 10, 2022

ORDER ENTERED: November 10, 2022

ANNEX A

TITLE 52. PUBLIC UTILITIES
PART I. PUBLIC UTILITY COMMISSION
Subpart C. FIXED SERVICE UTILITIES
CHAPTER 69. GENERAL ORDERS, POLICY STATEMENTS AND
GUIDELINES ON FIXED UTILITIES
Section xxx COMMISSION POLICY STATEMENT ON PUBLIC FIRE
PROTECTION SERVICE AND SYSTEM HYDRAULIC MONITORING

§ 69.xx1. General Scope and Purpose.

(a) All water public utilities.

The coordination and consistent application of safe, adequate, and reliable fire protection service offers a tremendous benefit to public safety, emergency fire protection organizations, and associated personnel. Safe, reasonable, and adequate regulated fire protection service offerings are a matter of utmost concern to the Commission. The policies and recommendations in this Policy Statement are intended to provide water public utilities with a guideline of the recommended actions and level of public fire protection service and system hydraulic monitoring that the Commission considers reasonable. The Commission will consider a water public utility's effort to meet the recommendations in this Policy Statement when determining just and reasonable rates for the water public utility.

(b) Class A water public utilities.

Fire protection services are often provided by Class A public water utilities. Class A water public utilities should operate with a sophisticated level of technical expertise including the use of modern water industry tools such as computerized hydraulic modeling software.

§ 69.xx2. Definitions.

The following words and terms, when used in this section, have the following meanings, unless the context clearly indicates otherwise:

Class A water public utility—as defined in Section 56.2 of the Commission's regulations at 52 Pa. Code § 56.2.

Computerized Hydraulic Model—a computer-based mathematical simulation used to predict the performance of a water system.

Discrete system—A stand-alone pipe network with boundaries that encompass all sources of water and endpoints.

§ 69.xx3. Fire Protection Service Afforded by Current System Design.

(a) A water public utility's operating procedures and best practices related to fire protection services, including fire protection connections and public and private fire hydrant service, should be maintained within this Commonwealth at an office or offices of the public utility located in the territory served by it and should be open for examination by the Commission.

(b) A water public utility's operating procedures and best practices related to fire protection service should include all of the following:

(1) A determination, based on a definable basis or standard or both, of operating characteristics such as minimum flow, pressure, and duration of flow and pressure that the water public utility will consider as its minimum parameters for fire protection connections and public and private fire hydrant service. These predetermined minimum operating characteristics should be applied to all fire protection connections and fire hydrants of a water public utility.

(2) A fire hydrant testing and maintenance program to ensure that all public and private fire hydrants within a discrete system are tested and exercised on a specified schedule as determined operationally and economically feasible by the water public utility.

(3) A method to clearly mark and identify each fire hydrant and each fire protection connection found to be incapable of providing service at the water public utility's minimum operating characteristics for fire protection connections and fire hydrant service.

(4) An estimated schedule to remove, remediate, or replace a fire hydrant or fire service connection found to be incapable of providing service at the water public utility's minimum parameters for fire protection connections and fire hydrant service.

(5) An analysis of the level of capital expenditures and associated timeframes for a water public utility to remediate, repair, or both a water system, as part of an acquisition due diligence process, required to bring the fire protection service up to at least the water public utility's acceptable operating characteristics.

(6) A written notification process to affected customers and local jurisdictions that may include property owners, the municipality and the local fire department of the location of any fire protection connection of fire hydrant that cannot meet the water public utility's acceptable operating characteristics.

(c) In conjunction with its obligations under 52 Pa. Code § 65.4 (relating to records), a water public utility that provides fire protection connections and fire hydrant service

should update its maps, plans, and records to include the location of and, if feasible, the last known operating characteristics of all public and private fire hydrants.

§ 69.xx4. Hydraulic Distribution System Modeling Required for Fire Protection.

(a) Hydraulic Distribution System Modeling is a valuable aide in forecasting system capabilities under varying operational conditions.

(b) Class A water public utilities should develop and implement a plan to use and maintain computerized hydraulic models for each discrete water system.

(c) The plan should address all of the following:

(1) A determination of the minimum water system size, based upon the complexity of the distribution pipe network and water service requirements, that should have a model.

(2) An identification of the commercially available hydraulic modeling software to be used.

(3) A description of how data from the public utility's other informational databases and systems, can be integrated into the computerized hydraulic model, including geographic information, supervisory control and data acquisition, and customer information systems.

(4) A schedule by which the computerized hydraulic model will be calibrated, updated, and maintained to ensure the accuracy is sufficient to reasonably predict a system's operational behavior to a determined level of accuracy set by the water public utility.