



**Water Distribution System Improvement
Charges:
A Review of Practices**

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Executive Summary

The EPA estimates the 20-year national water infrastructure need at \$384.2 billion, of which the largest amount (\$245.4 billion) is needed for distribution and transmission projects (EPA, 2013, pg. 5). Today's infrastructure replacement climate results from two primary factors: the age of infrastructure, and the absence for many utilities of a designated fund for replacing aging infrastructure (NRRI, 2009, pg 135). This first factor relates primarily to the economic boom at the end of World War II that resulted in significant growth in industrial, business, commercial, and residential development which resulted in an expansion of water and wastewater to support it. Much of this World War II era infrastructure is now at an age where replacement or significant repairs are required to ensure that the quality of service expected by customers can be maintained.

Many states that adopt Distribution System Improvement Charges (DSICs) face the issue of high costs associated with improving or replacing aging infrastructure within the systems. A report out of the Florida Public Service Commission observes that the cost of infrastructure replacement has increased significantly over the past century. For Example: installation for a foot of main that would have cost \$1 in 1900, now costs closer to \$100, and the cost to clean and reline one foot of main is approximately \$61 (FL PSC, 2001, pg. 1).

For some states (DSICs may be a part of the solution for addressing the divide between infrastructure needs and current funding. DSICs allow for rate increases that occur outside of general rate cases, to fund non-revenue producing investments to replace aging infrastructure. By collecting a small charge over time, DSICs help fund necessary infrastructure upgrades while mitigating rate shock that may occur otherwise. State commission oversight regarding what may be covered by DSICs, in concert with deliberate consumer protections helps to ensure that DSIC mechanisms support the goals of maintaining the quality of service to customers as well as enhancing fire protection.

To date, 16 states have currently implemented some form of DSIC mechanism, while other states have previously utilized DSICs, or are currently considering implementing a DSIC mechanism. Of the states surveyed, several states are recent adopters of DSICs, including: Arizona, Tennessee, and West Virginia. Other, early adopters of DSICs have re-examined the use of DSIC charges in their states, leading to recent expansions of DSIC-eligible utilities, changes in DSIC caps, or adoption of additional consumer protection mechanisms associated with the approval of DSIC charges.

Finally, in the 20 years since the implementation of the first DSIC mechanism, states that have adopted DSICs have engaged in a broad-ranging conversation about how DSIC mechanisms impact customers, utilities, and state commissions; and how DSICs can address current concerns in the water industry. These issues include: resource demands on staff from

DSIC administration, efficiency credits, long-term planning in conjunction with DSIC requests, and the potential for DSICs to support customer lead service line replacement efforts.

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Water Distribution System Improvement Charges

A Review of Practices

I. Introduction

Distribution System Improvement Charges (DSICs), first implemented in 1997 by the Pennsylvania Public Utilities Commission, have provided regulated water and wastewater systems throughout the United States with funding for critical infrastructure investments. This has allowed regulated water utilities to both make necessary improvements in the system and proactively replace aging parts of the system in order to improve the quality of service to customers. More specifically, DSICs can support infrastructure investment in qualified plant, plant maintenance and rehabilitation efforts; main extensions to eliminate dead ends which negatively impact the quality and reliability of service to customers; and (depending on state rules) new or additional water treatment facilities required to meet changes in state or federal water quality standards. It is important to note that DSIC eligibility is limited to revenue neutral projects. DSICs, which were initially developed as a rider to support water systems, have expanded in some states to include support for gas and electric utilities as well. This paper will focus on water and wastewater applications of DSICs. Distribution System Improvement Charges generally share several characteristics including:

- Provides money for non-revenue producing infrastructure,
- Recovers costs between general rate cases,
- Includes consumer protection measures, and
- Allows for clear oversight from state commissions.

Currently, 16 states allow regulated water and/or wastewater utilities to utilize DSIC mechanisms to make infrastructure improvements. While this paper will refer to these infrastructure improvement mechanisms as DSICs, they go by various names in different states including: System Improvement Benefit mechanisms, Water Infrastructure and Conservation Adjustment, Qualifying Infrastructure Plant Surcharge, System Infrastructure Charge, and Water System Improvement Charge. Regardless of the name, improvement charges are hailed by states that have implemented them as beneficial for increasing the speed of infrastructure replacement at a time when system replacement needs in many areas are growing precipitously. Water systems differ from other types of regulated utilities because of the uniquely high capital intensity of water systems compared to other utilities. Distribution System Improvement Charges have become one tool in the regulatory tool box for supporting water systems working to improve quality of service by replacing aging infrastructure in a cost-effective manner.

A. Background of DSIC

The Distribution System Improvement Charge was first implemented by Pennsylvania. Section 1307 of Pennsylvania's Statutes authorizes the PA PUC to prescribe a mandatory system for automatic adjustment of a utility's rates (FL, PSC, 2001, pg. 2). Although this section was generally used as authority for automatic rate adjustments for fuel costs of electric and gas utilities, it had also been used occasionally for certain state taxes and state infrastructure investment repayment (FL, PSC, 2001, pg. 2). Water companies during this time were faced with aging pipes that were reaching the end of their used and useful life, but were not replacing enough infrastructure each year to keep up with the losses while maintaining the expected quality of service. In 1996, two utilities petitioned under the provisions of Section 1307, to file an automatic adjustment charge tariff to establish a DSIC. While the appeal was pending, an amendment was introduced to the Pennsylvania Legislature to add a provision to Section 1307 which specifically provided for the allowance of an automatic adjustment charge for infrastructure remediation (FL, PSC, 2001, pg. 2). It is worth noting that Section 1307 was repealed in 2012, and replaced with section 1350-1370.

After Pennsylvania adopted a DSIC charge, several other states became early adopters, including: Indiana, Delaware, Illinois, Missouri, and New York. Additionally, many states first implemented a DSIC for regulated water companies, and later expanded the DSIC charge to cover wastewater company infrastructure improvement as well.

The NARUC Committee on Water has endorsed the use of Distribution System Improvement Charges as a best practice for water systems in a resolution published in 2005. The *2005 Resolution Supporting Consideration of Regulatory Policies Deemed as "Best Practices"* highlights 13 policies and mechanisms identified by the Committee on Water to "ensure sustainable practice in promoting needed capital investment and cost-effective rates". The use of Distribution System Improvement Charges is included in this list as one of the best practices (pg. 1). While the NARUC resolution endorses the use of a DSIC mechanism, it leaves it up to states to determine whether or not DSIC is appropriate for the state, recommending that state regulators "consider and adopt as many as appropriate of the regulatory mechanisms identified herein as best practices" (pg. 2).

B. The Nuts and Bolts of DSIC

The Distribution System Improvement Charge combines two important concepts: surcharges and automatic adjustment charges. A surcharge is a mechanism for cost recovery outside of the utility's basic revenue requirement. Surcharges are generally created for a specific reason, with an established time frame (FL PSC, 2001, pg. 3). Adjustment mechanisms and trackers are used to ensure that costs associated with providing utility service are recovered, and that companies do not have to wait for general rate cases to have these costs recognized (Lazar,

2016, pg. 103). Without automatic adjustment charges, a utility is unable to earn a return on infrastructure replacement projects until the next general rate case, but they will continue to incur depreciation expenses (FL PSC, 2001, pg. 3). These adjustments generally require less regulatory scrutiny because they are the result of rules and formulas which have already undergone regulatory review, and are fully evaluated (Lazar, 2016, pg. 100). Additionally, DSIC projects are limited to replacing or rehabilitating existing infrastructure, or, projects that are revenue neutral, and do not provide opportunities for utility growth or expansion (Atkinson, 2014, pg. 42).

Surcharges allowable by state commissions have historically been limited to circumstances where companies face costs that were substantial, volatile and uncontrollable, and that could harm the utility's financial health (AARP, 2012, pg. 11). These adjustment mechanisms are generally connected with specific cost accounts, and are included as their own line item on consumer bills. When the Pennsylvania Public Utilities Commission established the first DSIC, the stated purpose was threefold:

(1) recover the fixed costs (depreciation and pretax return) of certain nonrevenue producing, non expense reducing distribution system improvement projects completed and placed into service between rate cases; (2) provide the utility with the resources to accelerate the replacement of aging, water distribution infrastructure in order to comply with evolving regulatory requirements imposed by the Safe Drinking Water Act (SDWA); and (3) develop and implement solutions to regional water supply problems. Although the mechanisms employed by other states go by a different name, they are all defined similarly and serve the same purpose. (FL PSC, 2001, pg. 3).

While DSICs are generally utilized by regulated IOUs, some states allow municipal or not-for-profit utilities to file a DSIC to recover debt service incurred to replace eligible infrastructure (M. Stull, personal communication, July 26, 2017).

States and utilities that have implemented Distribution System Improvement Charges cite several key advantages provided by DSICS, these advantages may include:

1. Improved quality of service provided to customers over time,
2. Accelerated timeline for Infrastructure Remediation,
3. Mitigated rate shock,
4. Faster recovery of remediation costs for utilities, and
5. The potential for a multiplier effect.

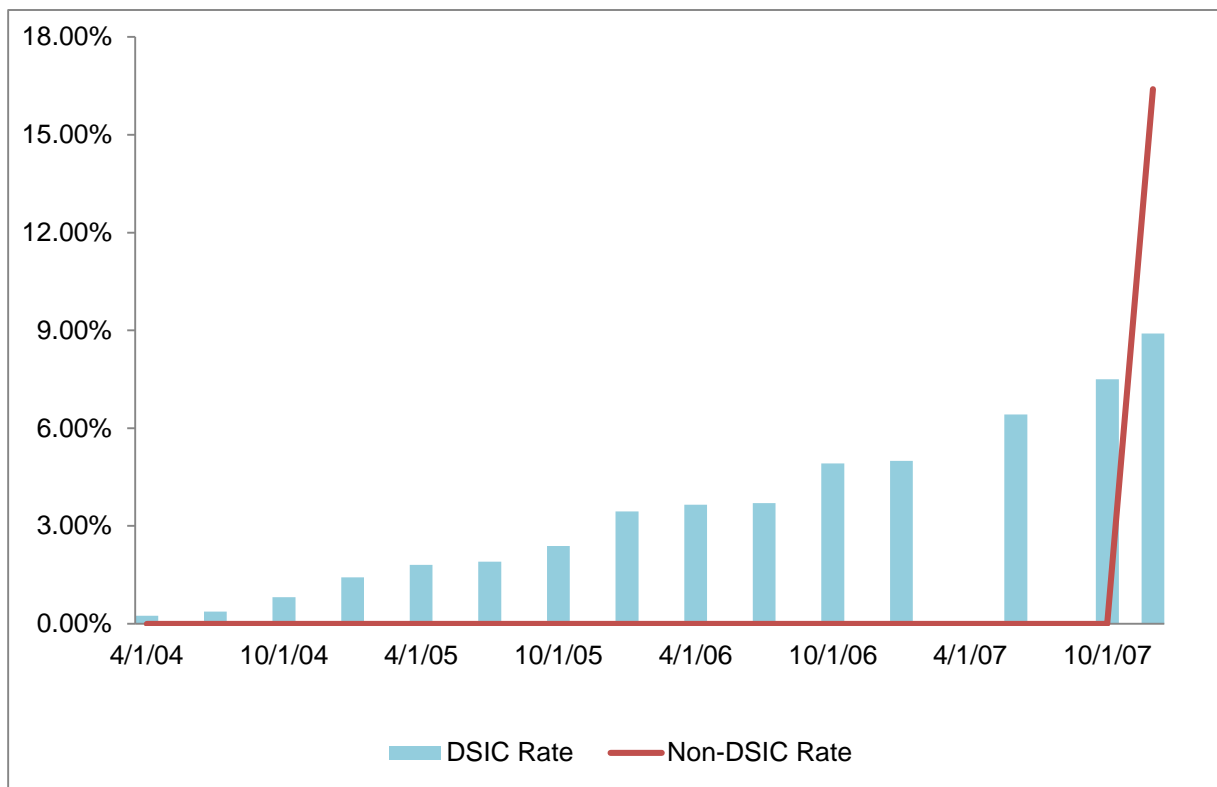
DSICs can help improve quality of service provided to customers over time by allowing water companies to complete necessary infrastructure improvement projects in a timelier manner. This can help by reducing non-revenue water loss, and improving water quality and

water pressure for customers. An added benefit of improved quality of service is improved fire protection reliability as a result of improved water pressure.

DSICs allow for accelerated infrastructure remediation. As cities in the United States have aged, some rate structures have not allowed adequate funding for infrastructure repair and replacement. This leads to infrastructure deterioration and water loss. By increasing funding for infrastructure repairs, utilities are able to take a more strategic approach to these repairs, which can save money, and improve the efficiency of repair planning.

The use of DSICs helps to mitigate rate shock. As water systems age, the amount of repair and replacement work necessary to maintain the quality of the system increases. By increasing funding for distribution system improvement projects before emergencies arise, water utilities have the opportunity to address needed water improvement projects in a strategic and cost-effective way, that helps reduce the need for emergency rate increases later on. This concept is illustrated graphically in Figure 1 below.

Figure 1: DSIC Rate Gradualism-- Smaller Rate Increases Over Time



Data adapted from: Norton, Cheryl. (n.d.). Infrastructure Replacement Programs. [Presentation]. Slide 11, original source: Steve Klick, Executive Policy Manager, PA PUC

DSICs allow for faster recovery of remediation costs. Because DSIC's allow water utilities to apply the costs of eligible projects to customer bills outside of general rate cases, this allows utilities to recover costs associated with infrastructure improvement in a timely manner, which helps them better maintain credit ratings (Atkins, 2014, p. 43). Faster recovery of costs helps to incentivize timely and proactive replacement of aging infrastructure.

The use of DSICs has the potential to create a multiplier effect. If a utility company will already be digging up roads to replace infrastructure, this may encourage other utilities and local governments to coordinate on other types of infrastructure replacement in the same place at the same time.

Finally, in the discussion of Distribution System Improvement Charges, it is important to differentiate DSICs from other riders or mechanisms. Infrastructure Surcharges have a different purpose, for example, than cash recovery of a return on Construction Work in Progress (CWIP). While a DSIC allows for rate increases for non-revenue producing investments to replace aging infrastructure between rate cases, an allowed cash return on CWIP relates to recovery of assets under construction through the rate case process. Additionally, cash return on CWIP¹ has traditionally been utilized to support large construction projects that are ongoing (Bishop, 2013, pg. 51). “Riders”, sometimes referred to as “trackers” or “balancing accounts”, are generally utilized to recover specific types of cost variations between rate case filings which are significant, volatile, and largely out of the utility’s control.

C. Infrastructure Improvement Needs

The Environmental Protection Agency estimates the 20-year national infrastructure need at \$384.2 billion, of which the largest amount (\$245.4 billion) is needed for distribution and transmission projects (EPA, 2013, pg. 5). Today's infrastructure replacement climate results from two primary factors: the age of infrastructure, and the absence for many utilities of a designated fund for replacing aging infrastructure (NRRI, 2009, pg 135). This first factor relates primarily to the economic boom at the end of World War II that resulted in significant growth in industrial, business, commercial, and residential development which resulted in an expansion of water and wastewater to support it. Much of this World War II era infrastructure is now at an age where

¹ According to a Brattle Group survey conducted in 2013, 21 states currently allow CWIP for private water companies, these states are: Arkansas, Colorado, Connecticut, Delaware, Florida, Hawaii, Illinois, Kentucky, Maine, New Jersey, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, West Virginia, and Wisconsin (Bishop, 2013, pg. 54).

replacement or significant repairs are required to ensure that the quality of service expected by customers can be maintained.

Many states that adopt infrastructure improvement charges face the issue of high costs associated with improving or replacing aging infrastructure within the systems. A report out of the Florida Public Service Commission observes that the cost of infrastructure replacement has increased significantly over the past century. For example: installation for a foot of main that would have cost \$1 in 1900, now costs closer to \$100, and the cost to clean and reline one foot of main is approximately \$61 (FL PSC, 2001, pg. 1). The Congressional Budget Office identifies one key point related to increased costs of infrastructure replacement: "returns from additional spending on a mature infrastructure network are typically smaller than those derived from the initial investment (2015, pg. 5). Effectively, costs for replacing infrastructure have increased at a faster rate than the cost of installing new infrastructure. Costs have not grown at a steady rate over time, which has created challenges for effective planning, and made necessary improvements and replacements costly.

D. Critiques and Responsive Consumer Protections Measures

1. Critiques

While many state commissions have chosen to adopt DSICs, critiques have surfaced over time. Some common concerns associated with DSICs include:

1. Reduced utility incentive to control costs,
2. DSICs shift utility business risks away from investors and onto customers without a reduction in allowed rate of return,
3. Customers face increased costs,
4. The DSIC mechanism circumvents the detailed review process that rate base receives during a full rate proceeding.
5. A proliferation of rate proceedings on trackers can create a financial burden for non-utility stakeholders, creating potential barriers to fair access to regulatory process

As DSIC mechanisms have become more commonplace, and commissions have had the benefit of experience, state commissions have developed new consumer protection mechanisms to address common concerns related to the use of DSICs. These measures for addressing concerns and ensuring customers are provided with adequate protections are included in the following section.

2. Consumer Protection Measures

While consumer protections have been included in DSIC rules since the very first DSIC was established, new measures have also developed over time to address specific concerns with DSICs. State commissions have implemented a number of key consumer protections as part of DSIC rules that help to provide a system of checks and balances for this surcharge mechanism; some of the most common consumer protection mechanisms are listed below.

Customer Notification Requirements mandate that a regulated utility company seeking to implement a DSIC must first notify all customers, most frequently through the mail. Occasionally, state commissions require DSIC notifications to be posted in local newspapers, instead of, or in addition to sending out customer mailers.

Public Advocate Notification Requirements ensure that public advocate offices are notified about regulated utility DSIC filings. This allows public advocate offices an early opportunity to review DSIC requests, and engage in the public hearing process on any potentially concerning requests.

Regular Filing Requirements mandate that utilities update state utility commissions about DSIC work on a regular bases to ensure that projects are going according to the commission approved plan. States with filing requirements generally require companies with DSIC projects to file updated information on the status of projects along with relevant collection and accounting information yearly, semiannually, or once a quarter.

Reset to Zero When New Base Rates Go into Effect ensures that water companies are not "double dipping" for project funding. Most reset requirements state that projects should be rolled into the rate base during the next rate case, and the DSIC rate is reset to zero. After such resets occur, only fixed costs of new eligible property not previously reflected in the base rates may be included in regular DSIC updates.

Reset to zero if periodic earnings exceed the allowable rate of return earnings test If, during any period, data filed by a utility utilizing a DSIC shows that in the utility's most recent earnings report, the utility will earn a rate of return that would exceed the allowable rate of return used to calculate its fixed costs under the DSIC, the utility must reset their DSIC to zero.

Reconciliation of DSIC Collections DSIC revenue recovery is generally monitored by state commissions. Overcollections can be credited to bills and under-collections can be charged either separately or as an item included in following surcharge calculations.

Recovery Caps set a limit on the amount of money recoverable from a DSIC charge, and are utilized by most states with DSIC mechanisms. Recovery caps can be based on several different metrics. Most recovery caps are expressed as a percentage cap with a time frame based on either an annual increase cap or an ultimate cap on the overall amount of the DSIC. Most

frequently, caps are established based on annual revenue, amount billed to customers, annual rate of return, or operating revenues. Maine takes a novel approach to DSIC caps based on the size of the utility as determined by annual revenue. Under this system, Maine defines utilities as small, medium, and large systems, and defines the caps based upon the size of the system; allowing smaller systems to collect DSIC charges with a larger cap than large systems (Maine PUC, 65-407, Ch. 675). Likewise, Illinois instituted a novel approach to DSIC caps in 2016. Illinois eliminated the overall cap on the program and instead required that the average annual impact on customers remain below 2.5% and never exceed 3.5%.

Earnings Test The Company will not be permitted to implement a DSIC Rate Component after a DSIC investment base reset following a base rate case order, or if an annual DSIC Rate Component is already in place, to increase the existing DSIC Rate Component with a subsequent calendar year's incremental projected investment in DSIC Facilities, if the Company's achieved return on average equity investment, as reflected in its audited financial statements for the preceding calendar year prepared using generally accepted accounting principles and measured on a calendar year basis, exceeds the authorized return on common equity set in the Company's most recent base rate case. If one of these situations occurs, then the Company will still make its DSIC filing for purposes of maintaining the existing DSIC Rate Component (if any) and addressing any needed reconciliations of costs and revenues from previous years.

Surcharge listed as a separate line item on customer bills This requires that water companies utilizing a DSIC charge clearly list the charge as a separate line item on customer bills. This allows customers to clearly see the amount of their bill being allocated to infrastructure improvement, and provides customers with a clearer picture of what their bill is being used for.

Annual Audit by Commission Staff this is a review of the utility documents associated with the DSIC. This audit, is generally scheduled for a specific time every year, and during this time commission staff make issue data requests to obtain information regarding whether plant included in DSIC calculations was eligible, whether the utility used the correct depreciation and cost of capital rates in calculations, whether the utility correctly accounted for all retirements corresponding to the eligible DSIC, whether the approved DSIC was correctly applied to the customers' bills, and whether any over- or under-collections were properly reflected in the DSIC calculation. This customer protection mechanism is generally used in addition to a mechanism for customer refund for over-collection, or a DSIC reset to zero.

E. Model DSIC Process

The process of applying for and implementing a Distribution System Improvement Charge varies from state to state. However, a general framework for the process is described below for illustrative purposes.

Company Files Infrastructure Assessment Report Several states require regulated utilities to file a report identifying water system infrastructure needs and providing the company's criteria for determining priority (CT, Sec. 16-262v. (3)). This report is used to identify eligible DSIC projects. Maine also has this requirement, calls it an Infrastructure Needs Assessment.

Filing A utility company may file a rate schedule establishing a DSIC with the utility commission. Some states disallow utilities from filing a DSIC rate schedule in the same calendar year that a utility has filed a request for a general rate case. The DSIC petition includes several elements including information on schedules, forms, testimony, exhibits, and other required supporting documentation. When a utility files a petition to establish a DSIC with the utility commission, generally, it must also inform the utility consumer counselor and customers.

Response Intervening parties may submit documentation to the commission indicating support or opposition of each part of the petition within a specified period of time. The filing utility is then provided with an opportunity to file a rebuttal within a certain period of time. During this period, the office of the consumer counselor has the chance to examine information provided by the utility to determine whether the DSIC petition complies with the rule requirements and whether the utility properly calculated the proposed charges (170 IAC 6-1.1-6 Sec. 6).

Hearing and Order The commission holds a hearing on the utility's DSIC petition and issue an order within a specified timeframe. This hearing reviews materials submitted by all parties and makes a determination on whether or not the DSIC request will be allowed on utility bills.

Notification to Customers Prior to implementation of a DSIC charge on customer bills, most state commissions require the utility to provide customers with a description of the DSIC charge, in and an explanation of why the improvement project or projects being funded by the charge is necessary.

DSIC Project Implementation While some commissions use forecasted investment (such as Illinois, Tennessee, and West Virginia) and others use historic investment, all DSIC recovery is based on Utility Plant in Service, not Construction Work in Progress.

DSIC Placed on Customer Bill Approved DSIC charges are placed on the bill, usually as a separate line item.

New DSIC Projects Reviewed and Approved After a utility commission has approved the initial DSIC, companies must submit new potential DSIC requests to the commission for review and approval. After approval for new projects, the costs may be included in customer bills as a line-item charge.

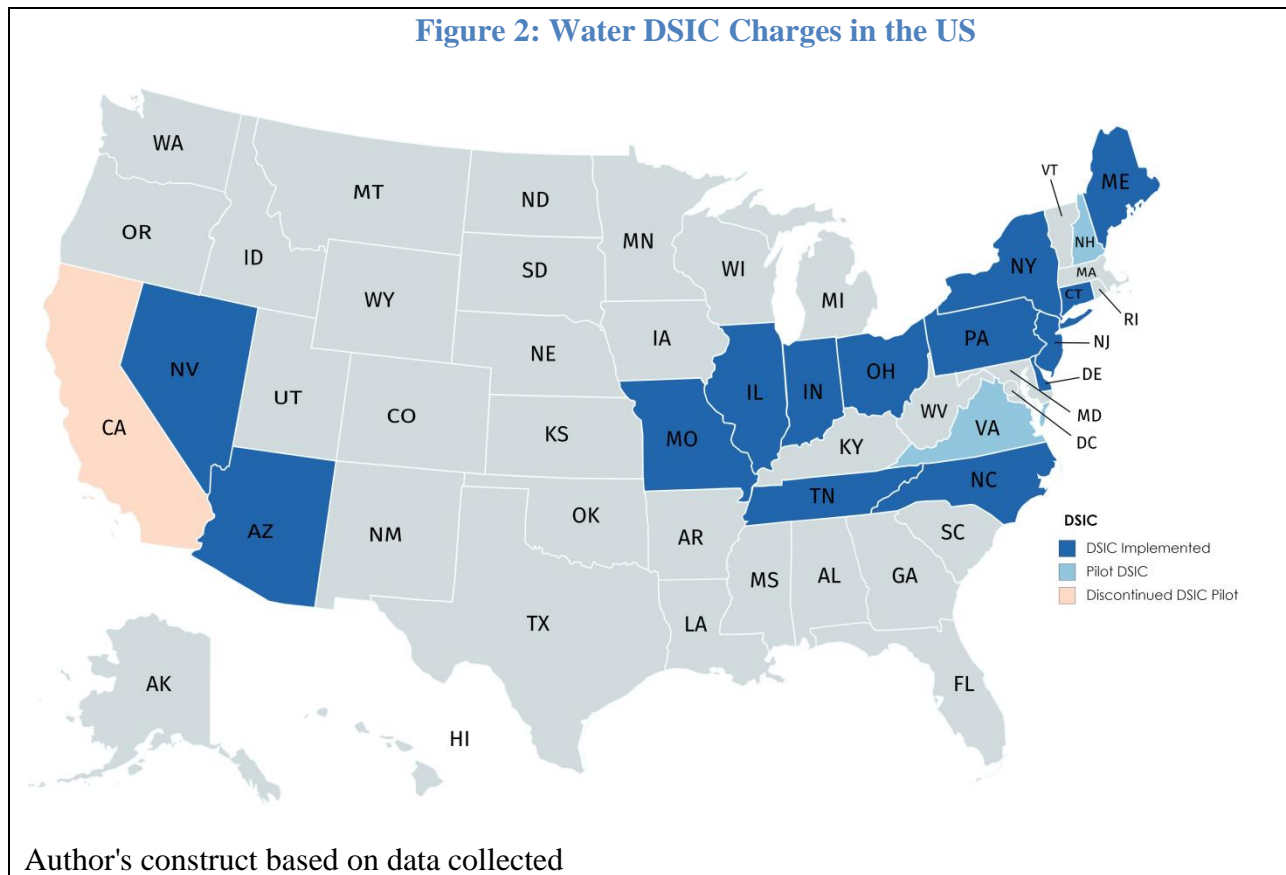
Reconciliation Procedure Utilities applying DSIC charges must reconcile their DSIC collections with the originally approved filings, generally, this occurs on an annual basis. During reconciliation, commission staff reviews the funds collected from DSIC on customer bills and confirm that the amount collected is within the bounds determined under the original filing.

II. Overview of State DSIC Charges

This section provides a review of states that have implemented some form of Distribution System Improvement Charge mechanism. This overview is divided into five sections: 1.) states that currently have DSIC mechanisms in place, 2.) states that have implemented pilot DSIC programs, and 3.) states that have previously implemented DSIC mechanisms, but have discontinued these programs.

A. Active States

Currently, 17 states have implemented some form of DSIC charge, including one state that has implemented a pilot DSIC program. A description of each state's mechanisms is provided below with information on the enabling docket or law citation, caps, eligible infrastructure, and additional details.



1. Arizona-- System Improvement Benefits mechanism (SIB)

Citation: Arizona Corporation Commission Decision No. 73938, decision reinstated in Decision No. 75832 (for more information, see Docket No. W-01445A-11-0310)

Year approved: 2013

Applicability: Water & Wastewater

Included Plant: Transmission and Distribution Mains, Fire mains, Services, including Service Connections, Valves and Valve Structures, Meters and Meter Installations, Hydrants

Filing Frequency: Annual

Cap: 5%

Customer Protections:

May file no more than 5 SIBs between rate cases, no more than one SIB surcharge filing every 12 months.

Must make annual SIB surcharge filing to true-up surcharge collection.

Must be approved by Commission prior to implementation. Staff and RUCO have 30 days to review the filing and dispute and/or file a request for the commission to alter the surcharge or true-up surcharge/credit.

Customer notification of surcharge at least 30 days prior to the effective date of a surcharge adjustment.

An efficiency credit of 5 % [because SIB work improves the overall efficiency of the distribution system, customers receive 5% of the total SIB surcharge back as a credit].

2. Connecticut-- Water Infrastructure and Conservation Adjustment

Citation: Section 16-262v and w of CGS

Year approved: 2007

Applicability: Water

Included Plant: Mains, Valves, Services, Meters and Hydrants, Main cleaning and relining, Relocation of facilities as a result of government actions, Purchase of leak detection equipment, Installation of production meters, Pressure reducing valves, Energy efficient equipment for operations, Capital improvements necessary to comply with river & stream flow regulations, Reasonable and necessary system improvements required for a water system acquisition approved by the authorities.

Filing Frequency: Semi-Annual

Cap: the WICA shall not exceed 10% of the water company's annual retail water revenues approved in its most recent rate filing

Customer Protections:

Customer notification requirement

Semiannual filings required

Adjustment shall reset to zero as of the effective date of new base rates approved

Shall be reset to zero if the company exceeds the allowable rate or return by more than one hundred basis points of any calendar year

If upon completion of the review of the annual reconciliation report the authority determines that a water company over-collected or under-collected the WICA adjustment, the difference between the revenue and costs for eligible projects will be recovered or refunded, as appropriate, as a reconciliation adjustment over a one-year period commencing on April first

The company shall refund the customers with interest for any over collection but shall not be eligible for interest for any under collection

3. Delaware-- Distribution System Improvement Chare

Citation: Delaware Code Title 26, Section 314

Year approved: 2001

Applicability: Water

Included Plant: Mains; Valves; Services; Meter & hydrants serving existing customers; Extending mains to eliminate dead ends which negatively impact the quality and reliability of

service to customers; Relocate existing facilities as a result of governmental actions that are not reimbursed; Place in service water supply sources identified as "A list projects" in the Governor's Task Force Report (Dec 2, 1999), or added to the list by DE Water Supply Coordinating Council (by Dec. 31, 2002); Place in service new or additional water treatment facilities, plant or equipment required to meet changes in state or federal water quality standards, rules or regulations.

Filing Frequency: Semi-Annual

Cap: Shall be capped at 7.5% of the amount billed to customers under otherwise applicable rates and charges, but the DSIC rate increase applied shall not exceed 5% within any 12 month period.

Customer Protections:

The utility shall serve the Division of the Public Advocate's office a copy of its filing at the time of its filing with the Commission

Customers of the utility shall be notified of changes in the DSIC rate by including information in the first bill received following change in rate

DSIC rate shall be subject to audit at intervals determined by the commission

Annual reconciliation ending Dec 31

The revenue received under the DSIC Rate for the reconciliation period shall be compared to the public water utility's eligible costs for that period with the difference between revenue received and eligible costs for the period recouped or refunded, as appropriate, over a one year period commencing July 1 of each year.

If the DSIC Revenues exceeded the DSIC eligible costs, such over-collections shall be refunded with interest

DSIC shall be reset to 0 as of the effective date of new base rates that provide for the prospective recovery of the annual costs theretofore recovered under the DSIC rate;

DSIC rate shall also be reset to 0 if, any quarter, data filed with the Commission by the public water utility show that the public water utility will earn a rate of return that exceeds the rate of return established in its last general rate filing

The DSIC rate may be reinstated when such data show that the established rate of return is not exceeded and will not be exceeded if the DSIC rate is reinstated and reset

4. Illinois-- Qualifying Infrastructure Plant Surcharge

Citation: Section 9-220.2 IL Statutes/ [Title 83, Ch I, e, part 656, Sect. 656.10](#)

Year approved: 2001 (amended in 2016)

Applicability: Water & Wastewater

Included Plant:

Water (Account #304-336):

Collecting & impounding reservoirs; Lake, river and other intakes; Wells and Springs; Infiltration Galleries and Tunnels; Supply Mains; Power Generation equipment; Pumping Equipment; Water treatment equipment; Distribution Reservoirs & standpipes; Transmission & distribution mains; Services; Meters and Meter installations; Hydrants; Backflow prevention devices;

Sewer (354-382):

Structures & Improvements; Power Generation Equipment; Collection Sewers- Force; Collection Sewers- Gravity; Special Collecting Structures; Services to Customers; Flow Measuring Devices; Flow Measuring Installation; Reuse Services; Reuse Meters and Meter Installation; Receiving Wells; Pumping Equipment; Reuse Distribution Reservoirs; Reuse Transmission & Distribution system; Treatment & disposal equipment; Plant Sewers; Outfall Sewer Line

Additional QIP:

Water main lining & related rehabilitation projects to eliminate water loss from water main breaks, as well as main extensions for water utilities that are constructed to eliminate dead ends and the unreimbursed costs recorded in the appropriate accounts that are associated with relocations of mains, services, hydrants and sewers occasioned by street or highway construction; Sewer collection main and manhole lining/grouting for sewer utilities that are rehabilitating collection systems to eliminate inflow and infiltration; Rehabilitation of sewer structures and receiving wells when rehabilitated as part of the scope of eliminating inflow and infiltration.

Filing Frequency: Annual

Cap: Annual average increase of 2.5%, ultimate cap of an increase of no greater than 3.5% in any year

Customer Protections:

Each utility shall provide notice for the initial filing by newspaper publication and by mailing a notice of the filing to each of its customers

QIP surcharges shall be presented as a separate line item on customer bills

Revenues resulting from QIP shall be recorded in a separate revenue subaccount

Annual reconciliations on March 15 of each year a utility has a QIP surcharge in effect (refund (with interest) or charge ratepayers according to true-up)

Internal audits shall be submitted no later than June 30 for the previous calendar year (internal controls are effectively preventing the double recovery of costs, costs recovered are recorded in the appropriate accounts (Sect. 655.100)

5. Indiana-- Infrastructure Improvement Charge

Citation: Indiana Code 8-1-31 and Indiana Administrative Code 170 IAC 6-1.1-1

Year Approved: Indiana Code 2000 (amended in 2014, 2015, and 2016)

Indiana Administrative Code 2005

Applicability: Water & Wastewater

Included Plant:

Water only: Distribution mains; Valves; Hydrants; Service lines; Meters; Meter installation; Other appurtenances necessary to transport treated water from the point it exits the treatment facility to the point at which it is delivered to the customer (170 IAC 6-1.1-1 Sec. 1.(a))

Water and Wastewater: As used in this chapter, "eligible infrastructure improvements" means new used and useful water or wastewater utility distribution or collection plant projects that:

- (1) do not increase revenues by connecting to new customers; and
- (2) either:
 - (A) for a public utility:
 - (i) are in service; and
 - (ii) were not included in the public utility's rate base in its most recent general rate case;

or

- (B) for a municipally owned or not-for-profit utility:
- (i) are in service;
 - (ii) were not included on the utility's balance sheet as plant in service in the utility's most recent general rate case; and
 - (iii) are not subject to another rate adjustment mechanism. (IC 8-1-31-5)

Filing Frequency: Annual

Cap: Not to exceed 10% of the eligible utility's base revenue level approved by the commission in the eligible utility's most recent general rate proceeding

Customer Protections:

Utility may not file a petition under this rule in the same calendar year in which the utility has filed a request for a general increase in the basic rates and charges

Annual reconciliation

6 Maine-- Infrastructure Surcharge and Capital Reserve Accounts for Water Utilities

Citation: 65-407 Chapter 675

Year approved: 2013

Applicability: Water

Included Plant: "Stationary physical plant assets needed to operate a water system. This definition includes, but is not limited to, water mains, storage tanks, and pumping facilities."

Filing Frequency: Semi-Annual

Cap:

Small Utility (total annual revenue of less than \$250,000): shall not implement or modify any Temporary Surcharge for Infrastructure Replacement or Repair that would result in an increase in revenue requirements greater than 7.5% of current revenue requirements, or if the

modification of a surcharge would result in an increase in revenue requirements of greater than 20% over rates in effect after the last general rate increase.

Medium systems (total annual revenue of less than \$750,000 and at least \$250,000): shall not implement a or modify any Temporary Surcharge for Infrastructure Replacement or Repair that would result in an increase in revenue requirements greater than 5% of current revenue requirements or if the modification of a surcharge would result in an increase in revenue requirements of greater than 15% over rates in effect after the last general rate increase;

Large Systems (total annual revenues of at least \$750,000): shall not implement or modify any Temporary Surcharge for Infrastructure Replacement or Repair that would result in an increase in revenue requirements greater than 3% of current revenue requirements, or if the modification of a surcharge would result in an increase in revenue requirements of greater than 10% over rates in effect after the last general rate increase;

Customer Protections:

Upon the effective date of new base rates, the surcharge will be rolled back to zero;

A water utility must provide notice to its customers for its first filing for a surcharge... the notice shall include in this notice the planned frequency of future changes in the surcharge.

A water utility shall provide an annual report updating its System Infrastructure Assessment Report, details on expected and actual collections for the Temporary surcharge" this shall be filed annually with the PUC due on April 1 of each year.

7. Missouri-- System Infrastructure Charge

Citation: Mo. Rev. Stat. 393.1000

Year approved: 2003

Applicability: Water

Included Plant:

Eligible infrastructure system replacements, water utility plant projects that:

- (a) Replace or extend the useful life of existing infrastructure;
- (b) Are in service and used and useful;
- (c) Do not increase revenues by directly connecting the infrastructure replacement to new customers; and
- (d) Were not included in the water corporation's rate base in its most recent general rate case

Water utility plant projects" may consist only of the following:

- (a) Mains, and associated valves and hydrants, installed as replacements for existing facilities that have worn out or are in deteriorated condition;
- (b) Main cleaning and relining projects; and
- (c) Facilities relocations required due to construction or improvement of a highway, road, street, public way, or other public work by or on behalf of the United States, this state, a political subdivision of this state, or another entity having the power of eminent domain provided that the costs related to such projects have not been reimbursed to the water corporation

Filing Frequency: Semi-Annual

Cap: "provided that an ISRS, on an annualized basis, must produce ISRS revenues of at least one million dollars but not in excess of ten percent of the water corporation's base revenue level approved by the commission in the water corporation's most recent general rate proceeding" 393.1003

Customer Protections:

Water corporation providing service to 1M+ inhabitants may establish a ISRS (customers served threshold);

In no event shall a water corporation collect an ISRS for a period exceeding three years unless the water corporation has filed for or is the subject of a new general rate proceeding;

Water corporation shall serve the office of the public counsel with a copy of its ISRS petition, its proposed rate schedules and supporting documentation at the time of filing, commission shall publish notice of filing;

May not change ISRS more than 2 times every 12 months;

The utility shall reconcile the ISRS annually, and shall submit a reconciliation of ISRS revenues collected and ISRS revenues authorized and a proposed ISRS adjustment to the commission for approval to recover or refund the difference, as appropriate; and.

The ISRS will be reset to zero when new base rates and charges become effective

8. Nevada-- System Improvement Rate

Citation: NRS 704.661, NAC 704.6336, 704.6339-63435

Year approved: 2014

Applicability: Water and Sewer

Included Plant:

Distribution Systems:

Distribution mains

Valves

Hydrants

Service lines

Meters

Meter installations

Any other appurtenances which are necessary to transport treated water

Production System:

Wells

Water treatment facilities

Chemical feed systems

Associated piping,

Any other appurtenances which are necessary for production

Transmission System:

Transmission mains

Storage facilities

Booster stations

Valves

Any other appurtenances which are necessary for transmission

Wastewater Systems (NAC 704.6338)

Wastewater mains

Lift stations

Facilities for wastewater treatment and any other appurtenances which are necessary for the collection of wastewater, treatment of wastewater, reclamation of wastewater and disposal of effluent.

Filing Frequency: Annual

Cap: Unless otherwise established, the authorized rate of return used to calculate the SIR revenue requirement for the utility shall be deemed to be 10.2% (NAC 704.6342). The monthly SIR revenue requirement is one-twelfth of the annual SIR revenue requirement.

Customer Protections:

Customer notification (704.6395)

The commission may, in consideration of the rate impact on the customers of the utility, limit the [SIR] revenue requirement which is eligible for recovery through the [SIR] to the actual prudently incurred costs related to the eligible project or approved project budget (704.6343, para. 2) (R078-14 Sec. 26, 3.)

9. New Hampshire-- Water Infrastructure and Conservation Adjustment

Citation: Order No. 25,539

Year approved: 2009, 2013

Applicability: Water

Included Plant: Service over and above an annual \$50,000 threshold (account 333) and hydrants (account 335) installed as in-kind (i.e., same size) replacements for customers;
Mains and valves (account 331) installed as replacements for existing facilities that have either reached the end of their useful life. are worn out or are in deteriorated condition;
Main cleaning and re-lining projects and relocations that are non-reimbursable (account 331);
Replacement of production meters (account 304);
Replacement of pressure reducing valves (accounts 309, 331)

Filing Frequency: Annual

Cap: WICA applied between general rate filings shall not exceed 7.5% of the Company's annual retail water revenues as approved in its most recent rate filing, and shall not exceed 5% of such revenues in any 12 month period

Customer Protections:

The company shall promptly notify the Commission and all parties if the company plans to add or delete projects and the reason for the proposed changes

The WICA shall be subject to audit prior to the determination by the Commission

The WICA will reset to zero as of the effective date of new base rates

Customers shall be notified of changes in the WICA by including appropriate information on the first bill they receive following any change. An explanatory bill insert shall also be included with the first billing. Before sending, the Company will review the notice with the Commission's Consumer Affairs division.

10. New Jersey-- Distribution System Improvement Charge

Citation: 44 NJR 1-723(a)/ N.J.A.C. 14:9-10.1 (2017)

Year approved: 2011

Applicability: Water

Included Plant: Water main replacement and rehabilitation
Water main cleaning and lining
Valve and hydrant replacement
Service line replacement (from main to curb or meter pit); and/or
Un-reimbursed utility relocation costs associated with relocations required by government entities

Filing Frequency: Semi-Annual

Cap: The cap is established by calculating five percent of the water utility's total revenues as established in the most recent base rate decision.

Customer Protections:

DSIC filings shall be filed with the board on a semi-annual basis, DSIC rates can be adjusted on the basis of subsequent DSIC filings no more frequently than every six months

The water utility shall stop assessing a DSIC charge at the earlier of the following:

1. The Board finds, at any time, that a water utility is not in compliance with the DSIC as approved;
2. The water utility does not meet the requirements of the earnings test calculation pursuant to (b) below; or
3. Upon reaching the date upon which this chapter has expired, except that a water utility may continue to assess the DSIC charge for any DSIC investments included in an approved Foundational Filing and made prior to the date this chapter expires.

No DSIC Foundational Filing shall be approved unless a water utility has had its base rates set by the Board within the past three years and any prior DSIC rate was reset to zero through the current, or prior, base rate case. A DSIC Foundational Filing may be approved concurrently with the setting of base rates.

If within three years after the effective date of a Foundational Filing, a water utility has not filed a petition in accordance with the Board's rules for the setting of its base rates, all interim charges collected under the DSIC rate shall be deemed an over-recovery, and shall be credited to customers in accordance with this subchapter.

A public notice and hearing, at a minimum, are required in the DSIC Foundational Filing.

11. New York-- Distribution System Improvement Charge

Citation:

Year approved: 2001/2013

Applicability: water

Included Plant: Wells, treatment plants, replacement mains, water tanks, regulatory requirements, services, and meters

Filing Frequency: Annual

Cap: Limited to list of projects and costs previously approved by the Commission

Customer Protections:

PSC audits all expenditures incurred under the program and must approve the investments before the company recovers the costs.

The surcharge will remain in effect until the rates are reset.

12. North Carolina-- Water and Sewer System Improvement Charge mechanism

Citation: [NC GS 62-133.12](#) Commission Rules and Regulations R7-39 and R10-26

Year approved: 2013

Applicability: Water and Sewer

Included Plant:

Eligible water system improvements:

Distribution system mains, Valves; Utility service lines (including meter boxes and appurtenances); Meters and hydrants installed as in-kind replacements; Main extensions installed to eliminate dead ends and to implement solutions to regional water supply in order to comply with primary, and upon specific Commission approval, secondary drinking water standards; Equipment and infrastructure installed to comply with primary drinking water standards; Equipment and infrastructure installed at the direction of the Commission to comply with secondary drinking water standards; Unreimbursed costs of relocating facilities due to highway projects

Eligible sewer system improvements:

Collection main extensions installed to implement solutions to wastewater problems; Improvements necessary to reduce inflow and infiltration to the collection system to comply with applicable State and federal law and regulations; Unreimbursed costs of relocating facilities due to highway construction or relocation projects; Pumps, motors, blowers, and other mechanical equipment installed as in-kind replacements for customers

Approval of Rate Adjustment Mechanism:

The Commission may approve a rate adjustment mechanism for a specific utility in a general rate case proceeding pursuant to G.S. 62-133.12 only upon a finding that the mechanism is in the public interest,

Filing Frequency:

A utility may file a request for a WSIC and/or SSIC adjustment no more frequently than semiannually. The WSIC and SSIC period shall be the 12-month period established by the Commission in conjunction with approval of a WSIC/SSIC mechanism for that utility. WSIC/SSIC shall be reset to zero as of the effective date of new base rates established.

Cap: Cumulative WSIC/SSIC revenue requirements may not exceed 5% of the total annual service revenues approved by the Commission in the utility's last general rate proceeding

Customer Protections:

Utility shall notify customers about proposed WSIC/SSIC mechanism

The eligible water and system improvements must be completed and placed in service prior to the utility requesting Commission approval of the WSIC/SSIC.

Utility seeking WSIC/SSIC must provide copy of filing request to the Public Staff (Public Staff may recommend the Commission approve, modify and approve or reject the proposed WSIC/SSIC)

Periodic reporting by the utility required by the Commission in a format prescribed by the Commission; an audit by the Public Staff and report to the Commission required

Any rate adjustments authorized under the WSIC and SSIC mechanisms outside of a general rate case will be allowed to become effective, but not unconditionally approved. That is, the adjustments will be provisional, will not be deemed prima facie just and reasonable, and, thus, may be rescinded retroactively in the utility's subsequent general rate case, at which time the adjustment may be further examined for a determination of its justness and reasonableness.

Over-collection shall be refunded to utility's customers including an amount of interest at such rate as the Commission determines to be just and reasonable

The Commission may eliminate or modify any rate adjustment mechanism approved in this case upon a finding that it is no longer in the public interest.

13. Ohio-- Infrastructure Improvement Surcharge

Citation: Ohio Rev. Code § 4909.172

Year approved: 2003

Applicability: Water and Sewer

Included Plant:

BOTH:

Chemical feed systems

Filters

Pumps

Motors

Plant generators

Main extensions that resolved documented problems,

Main cleaning or relining

Waterworks:

Meters

Service lines

Hydrants

Mains

Valves

2) Sewage Disposal System:

Motors

Sludge-handling equipment

Mains & lift stations

Inflow & Infiltration elimination, and

3) Unreimbursed capital expenditures made by companies for facility relocation required by a governmental entity due to a street or highway project;

4) Minimum land or land rights acquired by the company as necessary for any service line, equipment, or facility described in the above sections

Filing Frequency: Annual

Cap: Each IIS shall not exceed 3% for sewage disposal, and 4.25% for waterworks of the rates and charges applicable to the class and for the tariff in effect on the date the app. was file (4909.172 (B)(2)) The commission shall not authorize a company to have more than three infrastructure improvement surcharges for any single company tariff in effect at any time.

Customer Protections:

Sunset clause of December 31, 2025

The commission may reduce the amount or terminate an IIS if it determines that the surcharge causes the company to earn an excessive rate of return on its valuation.

The company shall provide notice of any IIS authorized to each affected customer

The commission shall not authorize a company to have more than 3 IISs for any single company tariff in effect at any time.

A company for which an IIS is authorized may file an application for another such surcharge not sooner than 12 months after the filing date of its most recent IIS application.

The commission shall provide an opportunity for the filing of comments on an application.

14. Pennsylvania-- Distribution System Improvement Charge

Citation: Sect. 1307(g) PUC

Year approved: 1997 (updated in 2012)

Applicability: Water and Sewer

Included Plant:

Water:

Services,

Meters and Hydrants installed as in-kind replacements for customers,

Mains and valves installed as replacements,

Main extensions installed to eliminate dead ends and to implement solutions to regional water supply problems that present a significant health and safety concerns for customers,

Main cleaning and relining projects,

Unreimbursed costs related to highway relocation projects where a water utility must relocate its facilities, and

Other related capitalized costs

Wastewater:

Collection sewers,

Collecting mains and service laterals (including sewer taps, curb stops, and lateral cleanouts installed as in-kind replacements for customers,

Collection mains and valves for gravity and pressure systems and related facilities such as manholes, grinder pumps, air and vacuum release chambers, cleanouts, main line flow meters, valve vaults, and lift stations installed as replacements or upgrades for existing facilities that have worn out, are in deteriorated condition, or are required to be upgraded by law, regulation, or order,

Collection main extensions installed to implement solutions to wastewater problems that present a significant health and safety concern for customers currently receiving service for the wastewater utility,

Collection main rehabilitation including inflow and infiltration projects,

Unreimbursed costs related to highway relocation projects where a wastewater utility must relocate its facilities, and

Other related capitalized costs.

Filing Frequency: Quarterly

Cap: The DSIC is capped at 5% of the amount billed to customers for distribution services (including all applicable clauses and riders) as determined on an annualized basis (note, some water utilities have commission-approved DSICs that are capped at 7.5% of the amount billed for service).

Customer Protections:

Annual Audit/Reconciliation

DSIC reset to zero upon application of new base rates to customer billing

Customer notice

DSIC shall be applied equally to all customer classes

The DSIC will also be reset to zero if, in any quarter, data filed with the Commission in the Utility's then most recent Annual or Quarterly Earnings reports show that the Utility would earn a rate of return that would exceed the allowable rate of return used to calculate its fixed costs under the DSIC as described in the pre-tax return section

The DSIC of a water utility will not apply for public fire protection customers

15. Tennessee-- Qualified Infrastructure Improvement Program

Citation: Tenn Ann 65-5-103, TCA Section 65-5-103

Year approved: 2013

Applicability: Water

Included Plant: 1. recovers costs associated with renewing and replacing pipes
2. meeting EPA requirements
3. Supporting local economic projects including, but not limited to:
a. Infrastructure and equipment associated with alternative motor vehicle transportation fuel;
b. Infrastructure and equipment associated with combined heat and power installations in industrial or commercial sites; and
c. Infrastructure that will provide opportunities for economic development benefits in the area to be directly served by the infrastructure.

Filing Frequency: Annual

Cap: None

Customer Protections:

Annual audit/reconciliation filing

16. Virginia -- Water and Wastewater Infrastructure Service Charge

Citation: Order No. 16-0550-P-DSIC

Year approved: 2017

Applicability: Water (Alexandria District)

Included Plant: T&D mains, valves, services, meter boxes, hydrants, dead-end elimination, solutions to regional water supply in order to comply with primary and secondary water standards

Filing Frequency: Annual

Cap: 7.5% of operating revenues

Customer Protections:

The WWISC will be subject to audit at intervals determined by the Commission. It will also be subject to an annual reconciliation and earnings test.

The WWISC Current Service Charge will be reset to zero upon application of new base rates.

17. West Virginia-- Distribution System Improvement Charge

Citation: Order No. 16-0550-W-DSIC

Year approved: 2017

Applicability: Water

Included Plant: "The Parties now agree and recommend that at this time, the Commission should not establish distinct categories of utility investment eligible for DSIC rate recovery (or by omission, not eligible for it). In future DSIC cases, the Parties may take whatever positions they choose on whether a proposed investment should be eligible for DSIC rate recovery or whether one or more distinct categories of utility investment eligible for DSIC rate recovery should be established" (Case No. 16-0550-W-DSIC, Attachment A, pg. 6).

Filing Frequency:

Cap: DSIC will be limited to 3.75% of the revenue requirement authorized in the most recent base rate case. When combined with percentage increases implemented through previous DSIC filings since the most recent rate case, does not exceed a Cumulative Cap of 7.5%. (Case No. 16-0550-W-DSIC, Attachment A, pg. 7)

Customer Protections:

At no point will there be utility plant assets that are simultaneously included in base rates and a DSIC Rate Component or a base rate that provides or will provide the Company with recovery of revenues associated with the revenue requirement on investments for which a DSIC Rate Component proves or will provide simultaneous recovery. (Case No. 16-0550-W-DSIC, Attachment A, pg. 6)

Annual Caps

Cumulative Cap

Earnings Test. The Company will not be permitted to implement a DSIC Rate Component after a DSIC investment base reset following a base rate case order, or if an annual DSIC Rate Component is already in place, to increase the existing DSIC Rate Component with a subsequent calendar year's incremental projected investment in DSIC Facilities, if the Company's achieved return on average equity investment, as reflected in its audited financial statements for the preceding calendar year prepared using generally accepted accounting principles and measured on a calendar year basis, exceeds the authorized return on common equity set in the Company's most recent base rate case. If one of these situations occurs, then the Company will still make its DSIC filing for purposes of maintaining the existing DSIC Rate Component (if any) and addressing any needed reconciliations of costs and revenues from previous years. (Case No. 16-0550-W-DSIC, Attachment A, pg. 7-8)

B. Pilot programs

New Hampshire Public Utilities Commission allowed Aquarion Water to implement a Water Infrastructure and Conservation Adjustment (WICA) in 2013 (Order No. 25,539). Aquarion's WICA is currently still a pilot program and will be evaluated for its effectiveness in the next full rate proceeding. More information on New Hampshire's pilot program can be found in the previous section on active DSIC charges.

Commonwealth of Virginia State Corporation Commission has approved a Water and Wastewater Infrastructure Service Charge (“WWISC”) for eligible investment after April 1, 2017, in Case No. PUE-2015-00097, final Order issued May 24, 2017. This was approved as a three-year pilot limited to eligible water investments for the Alexandria District only. Water utility project means: 1) transmission and distribution system mains installed as in-kind replacements (account 331), valves, utility service lines (including meter boxes and appurtenances)(Account 333), hydrants installed as in-kind replacements (Account 335); and 2) main extensions installed to eliminate dead ends and to implement solutions to regional water supply in order to comply with primary and secondary drinking water standards.

New York Public Service Commission allowed Long Island Water Corporation to implement a Distribution System Improvement Charge (DSIC) in 2005 (Order Case 04-W-0577). Long Island’s DSIC was rolled into base rate increases in Case 11-W-0200 for the rate years ended 3/31/2013, 3/31/2014 and 3/31/2015. The DSIC surcharge was terminated effective 4/1/2012. Information on New York's System Improvement Charge (SIC) can be found in the previous section on active DSIC charges.

California developed a pilot program in Los Angeles in 2008, which created an Infrastructure Investment Surcharge Mechanism (IISM). This pilot was intended to signal to water utilities and communities the California PUC's interest in ensuring adequate ongoing levels of new investment for replacements and upgrades necessary to maintain the quality of California's drinking water (CA PUC, Decision 07-08-030). Additionally, the CA commission focused in this decision on its dedication to supporting new investment in infrastructure, stating: "by providing a separately identified revenue stream, the DSIC is a strong signal to the investment community of the Commission's commitment to supporting new infrastructure investment (CA PUC, Decision 07-08-030). However, this program was never adopted into state rules, in part because of an alternative policy that the California Public Utilities Commission implemented: a three-year future -looking rate case process that allows for cost recovery among other benefits (Atkinson, 2014).

III. Trends, transitions, and additional considerations

The first Distribution System Improvement Charge was adopted by Pennsylvania to address a gap between needed infrastructure investment and funding. This original DSIC was updated by Pennsylvania effective in 2013, at which time additional elements were added to the original DSIC to improve the quality of the outcomes. At this time, Pennsylvania also expanded the DSIC to wastewater systems.

This trend of updating, and expanding has been seen with many of the states that have implemented DSIC charges. Updated, and new DSIC charges aim to address new issues that have come to be considered part of the infrastructure improvement space, including issues of jurisdiction, long-term planning, efficiency credits, filing burden, and how DSICs can aid customer lead service line replacement. State Commission's willingness to take on these issues, and develop improved methods for handling them has helped ensure better outcomes and higher levels of accountability. These issues are discussed in more detail below.

A. Fair value determination challenge

After the Arizona Corporation Commission approved a System Improvements Benefits (SIB) mechanism in 2014, the Arizona Residential Utility Consumer Office (RUCO) challenged the constitutionality of the SIB mechanism, arguing that the mechanism violated the Arizona Constitution's requirements that the Commission is obligated to find fair value (Sabo, 2016). The Arizona courts allow the Commission to engage in ratemaking without making a fair value finding in two situations: when the Commission establishes an automatic adjuster mechanism and when the Commission approves interim rates (AZ AG Op. 71-17). In this ruling, the Arizona Court of Appeals determined that the SIB mechanism allowed for water companies to recover capital expenditures instead of just "narrowly defined operating expenses that naturally fluctuate," noting that the SIB mechanism was substantially different enough from an automatic adjuster clause in its essential attributes that it "does not fall within that exception to the constitutional fair value determination requirement" (Ariz. Ct. App. Aug. 18, 2015, paragraph 23-26).

The Arizona Supreme Court then granted a review of the case and issued an opinion in August of 2016 reversing the Court of Appeals decision and affirming the Commission's original decision. The Court determined that the traditional general rate case is not a constitutional mandate, and therefore the Arizona Corporation Commission has discretion in how it determines fair value (Sabo, 2016). The Court ruled that the yearly rate changes allowed by the SIB mechanism were legal because the ACC would update the fair value finding when approving each annual surcharge.

B. Efficiency credits

The state of Arizona established its current System Improvement Benefits Mechanism on December 5, 2016, in Decision No. 75832. The SIB mechanism includes a 5% efficiency credit on SIB plant that compensates customers for water efficiency gains that are the result of the infrastructure improvement stemming from the SIB mechanism. In effect, the 5% credit "acknowledge[s] for the benefit of customers that the system improvements to be completed with the SIB funds were expected to lower general maintenance costs and/or reduce other expense such as pumping costs" (J. Armstrong, personal communication, November 2, 2017). Efficiency credits are a relatively new concept, first introduced during the original Arizona SIB settlement as one of the provisions that led to the approval of the SIB.

C. Greater resource demands upon commission staff

One common line of questioning in the DSIC discussion is: "if commission staff are still required to review water utilities' administration of DSICs, does this save staff any time?". The Arizona Corporation Commission considered this issue carefully when implementing its DSIC, and issued the following relevant statement in Decision No. 73938:

Although a DSIC-like mechanism could result in much greater resource demands upon the Commission and Staff than would the current regulatory structure, efforts were made by the parties in structuring the SIB to place more of the informational filing burdens on the Company, thus mitigating many of the resource concerns that had previously existed with the original DSC proposal" (2016, pg. 54).

This effort to ensure that DSIC rules are created in such a way that companies benefiting from the charge take on the informational filing burden is one way to ensure that Commission staff are not unduly burdened by new charges. Establishing clear timelines (either quarterly, biannually, or annually) for when companies should provide state commissions with information for audits, or requiring companies to conduct internal audits which are then submitted for commission review all help commission staff reduce the time burden associated with additional oversight. The flip side of this coin is that placing the informational filing burden on water companies might disincentivize small or struggling utilities who could most benefit from utilizing this mechanism.

Other states have updated DSIC rules to require the submission of internal audits by utilities that have a DSIC mechanism in place. This type of action is another example where states have shifted some portion of the administrative demand from commission staff to utilities benefitting from the use of a DSIC. While such a step would still require staff review, this reduces the burden placed on staff.

D. Long-term planning in conjunction with DSICs

Several states have recently implemented some form of long-term planning requirement either in addition or in conjunction with a DSIC application. These long-term planning requirements go by different names but focus on developing a more strategic approach to the outcomes of infrastructure improvement and development over a specified time period. More specifically, this process can include a detailed analysis of the physical characteristics of the water mains within a company's systems, a schedule of planned replacement, projected annual expenditures, and a description of how improvements will be accelerated with the plan.

The Pennsylvania PUC is one example of a state that implemented a long-term planning framework. This framework called a Long-Term Infrastructure Improvement Plan (LTIIP) must be completed by utilities interested in utilizing a DSIC mechanism to accelerate infrastructure improvement projects and requires companies to provide information on the following six elements as they relate to eligible DSIC recovery:

- (1) Types and age of eligible property;
- (2) Schedule for its planned repair and replacement;
- (3) Location of eligible property;
- (4) Reasonable estimate of the quantity of property to be improved;
- (5) Projected annual expenditures and measures to ensure that plan is cost-effective; and
- (6) Manner in which replacement of aging infrastructure will be accelerated and how repair, improvement, or replacement will maintain safe and reliable service (66 Pa. C.S. § 1352(a)(3) and (a)(4)).

The LTIIP is expected to reflect and maintain an acceleration of infrastructure replacement that is greater than utilities' historic level of capital improvement. In addition, PA PUC has created a requirement that utilities provide an Asset Optimization Plan (or AAO Plan) which is required as a part of section 1356 and used in conjunction with its Long-Term Infrastructure Improvement Plan. The AAO Plan requires two elements: (1) a description of all eligible property repaired, improved and replaced in the preceding 12 months and (2) a detailed description of all facilities to be improved in the upcoming 12 months. The Pennsylvania Office of Consumer Advocate (OCA) contends that "the Asset Optimization Plan, when used in conjunction with LTIIP, is a key feature of a well-managed DSIC program" (PA PUC, 2012, p. 29). The PA PUC also specified in its rulemaking that significant modifications to the LTIIP will be subject to public notice and Commission approval.

E. DSIC as a means to replace residential lead service lines

Several states have considered utilizing DSIC to replace lead service lines, most recently: Indiana and Pennsylvania. In July of 2017, Indiana added a new chapter to its code concerning replacement of customer-owned and utility owned lead service lines (Section 8. IC 8-1-31.6). This allowed for expenditures related to lead service line replacement using DSIC funds (although lead service line replacement expenditures will not count towards the DSIC cap of 10%), after the company receives commission approval (M. Stull, personal communication, July 27, 2017; Section 8. IC 8-1-31.6). In order for a company to receive commission approval, they must provide a utility plan to the commission that addresses the following details:

1. The availability of grants or low-interest loans, and own the utility would use available grants to reduce the cost to customers;
2. A description of how the replacement of customer-owned lead service lines will be accomplished;
3. The estimated savings resulting from water utilities replacing lead service lines versus customers;
4. The estimated number of lead mains and lead service lines estimated to be part of the water utility's costs;
5. An estimate for the number of customer owned lead service lines that the company would try to replace annually;
6. A range estimate of the total feet of lead mains to be replaced annually;
7. The water utility's proposal for addressing the costs of unusual site restoration work necessitated by improvements located on the customer owned portion of the lead service line;
8. The water utility's proposal for communicating the availability of utility's plan to replace the customer owned portion of the lead service line in conjunction with the utility's own portion of the lead service line and documenting the customer's consent or lack of consent for replacement;
9. The utility's proposal concerning whether the water utility or the customer will be responsible for future replacement or repair of the portion of the new service line corresponding to the previous customer owned lead service line (Section 8. IC 8-1-31.6).

The Pennsylvania Public Service Commission is also currently considering allowing lead service line replacement as an eligible DSIC charge. While the Commission has already allowed a water company in Pennsylvania to replace customer and company pipes at the same time, this plan was not accounted for using a DSIC mechanism, but instead allowed the company to replace lines at its initial expense, and then recover the cost during the company's next rate case as a regulatory asset (Dougherty, 2017). Pennsylvania American Water Company (PAWC) is seeking permission to replace customer's lead service lines using DSIC funding (O'Connell, 2017). The proposed plan would allocate \$6 million annually to replace both company and

customer sections of lead service line, which would allow PAWC to 1,800 customer systems annually at a cost of \$3,500/house, or 11 cents per customer each month (O'Connell, 2017). This request is currently an active docket, and more information can be found on the Pennsylvania PUC's website as part of Docket Number P-2017-2606100.

IV. Conclusion

In the twenty years since the implementation of the first Distribution System Improvement Plan, the concept of a DSIC mechanism has grown and evolved to meet the needs of consumers and utilities alike. While the use of popular consumer protection methods has spread from state to state over time, states still maintain their own distinct versions of Distribution System Improvement Charges. The particular structure of DSIC charges and customer protections includes a high amount of variability based on the consumer concerns and current events shaping the narrative around infrastructure improvement within each state. For states considering the implementation of a DSIC then, it is valuable to consider the particular concerns of utilities and customers in addition to the desired outcomes related to implementing a DSIC charge.

The continued popularity of DSIC mechanisms, which can be observed in the steady adoption of, and amendment of preexisting DSICs speaks to the need for additional support for replacement of water infrastructure in many parts of the US. The EPA estimates the 20-year national infrastructure needs at \$384.2 billion, of which the largest amount (\$245.4 billion) is needed for distribution and transmission projects (EPA, 2013, pg. 5). Today's infrastructure replacement climate results from two primary factors: the age of infrastructure, and the absence, for many utilities, of a designated fund for replacing aging infrastructure (NRRI, 2009, pg 135). This first factor relates primarily to the economic boom at the end of World War II that resulted in significant growth in industrial, business, commercial, and residential development which resulted in an expansion of water and wastewater to support it. Much of this World War II-era infrastructure is now at an age where replacement or significant repairs are required to ensure that the quality of service expected by customers can be maintained. Added to this, is the fact that Water utilities are among the most capital-intensive sectors when compared to other regulated utilities such as electric, natural gas, and telecommunications.

As long as infrastructure replacement remains an issue, current trends in the adoption of DSIC mechanisms suggest that states who see the DSIC as beneficial will continue to adopt the measure. The fact that state commissions have allowed DSIC rules to be updated to streamline state commission staff involvement, add new customer protection measures, even considered new applications of DSIC rules in the case of customer lead service line replacement, suggests that DSICs as a policy have sufficient plasticity to continue supporting regulated utilities and customers alike.

Consequently, with the continued growth in the use of DSICs, it is more vital than ever for commissions and utilities to keep a close eye on the goal of affordability. One clear illustration of residential consumers' concern related to affordability comes from the Federal Reserve Board's Survey of Household Economics and Decisionmaking (SHED) which found "forty-four percent of adults say they either could not cover an emergency expense costing \$400,

or would cover it by selling something or borrowing money" this same survey reported that "just under one-fourth of adults are not able to pay all of their current month's bills in full" and "13 percent struggle to pay bills in some months due to income volatility" (p. 1). Put together, this survey paints a picture of household struggling to make ends meet after a recession. To these households, an additional surcharge on a utility bill may present a financial hardship.

Studies published in 2017 indicate that average water bills in the United States are \$35 - \$40 per month, and infrastructure surcharges are generally a small percentage of the bill. Surcharges of one to five percent, for example, would represent monthly charges of \$0.35 - \$2.00. For this reason, a moderate infrastructure surcharge presents a more feasible option for Low and Moderate Income customers than emergency rate hikes. This was underscored in NARUC's 2013 Resolution Endorsing Consideration of Alternative Regulation that Supports Capital Investment in the 21st Century for Water and Wastewater Utilities. The resolution stated that "alternative regulatory mechanisms can enhance the efficiency and effectiveness of water and wastewater utility regulation by reducing regulatory costs, increasing rates for customers, when necessary, on a more gradual basis; and providing the predictability and regulatory certainty that supports the attraction of debt and equity capital at reasonable costs and maintains that access at all times." However, this does not mean that regulators or utilities should forget the burden that any rate increase places on customers. The current climate of water utilities in America is the result of a complex array of issues, and for that reason, no policy intervention on its own will provide a silver bullet. However, a gradualist approach will begin to help right the ship.

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