

Structure Upgrades



Water Infrastructure Planning Simplified

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It's not too soon for water utilities to start thinking about the upcoming era of asset replacement. Planning must start now, looking at a thirty- to fifty-year horizon for infrastructure needs. Few utilities will know which specific assets are going to need replacement, or when. But the *aggregate* dollar amounts required over the long term are what matter most. Accurately predicting the future needs of a specific asset is not important as long as a reasonable estimate of the lives and costs of groups of assets, or asset classes, can be made.

Estimating Long-Term Reinvestment Needs

An asset class is a group of assets that are intuitively similar and have reasonably similar useful lives and interim reinvestment needs ("refurbishments") and replacement costs. For example, consider the asset class of above-ground steel reservoirs. Engineers might estimate that such reservoirs have typical useful lives of about sixty years. Accountants say they cost about 58 cents per gallon. O&M

and Engineering departments might judge that on average they need three types of refurbishment during their life cycle:

- A: exterior painting every 7.5 years at 5 percent of replacement cost;
- B: interior painting and floor repair every 15 years at 15 percent of replacement cost; and
- C: floor replacement at 30 years at 15 percent of replacement cost.

Under this scenario, the long-term capital reinvestment pattern for a steel above-ground reservoir can be developed (see bar chart at left). After 60 years, the cycle repeats.

The reinvestment needs over the next 75 years for a 2-million gallon reservoir installed in 2003 are shown in the table below.

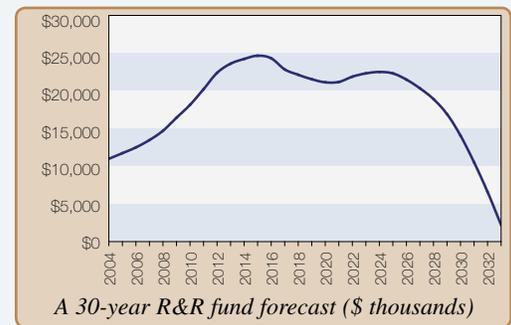
By copying and pasting this simple spreadsheet, the analysis can be repeated for all steel reservoirs in the district, provided the installation year and capacity of each are known. By aggregating the expenditures yearly, the total capital costs likely to be incurred in the future for the entire collection of steel tanks can be estimated.

This approach can be repeated to estimate the future needs of all water infrastructure assets, class by class. Most utilities will have no more than 15 to 20 asset classes, and many assets have no, or at most one, expected refurbishment type during their life cycles. By totalling all yearly expenditures, a reasonable financial estimate of the long-term replacement and refurbishment (R&R) needs of the entire system can be obtained.

Funding Long-Term Reinvestment Needs

Most utilities that plan for the long term have established R&R funds into which they deposit money, typically at a constant rate or a rate increasing with

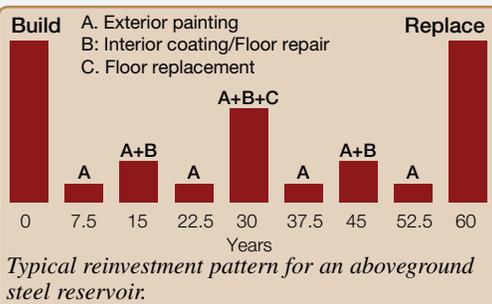
inflation. The amounts and patterns of accumulation are planned so the fund will serve all or most replacement needs over a specific time frame, often thirty to fifty years. The funding program is designed to simultaneously meet R&R needs, or a specified portion of those needs, for the planning period without causing serious or sudden rate increases or accumulating too much money during periods of relatively low R&R needs.



A 30-year R&R fund forecast (above) was presented to a utility's management group, who then proposed to its board of directors that \$8 million be transferred to the R&R fund annually, increasing at two percent each year. Upon reviewing the results of the R&R needs analysis, the board approved the funding as a matter of long-term financial policy. This utility's infrastructure system is now assured for the next thirty years. Management intends to repeat its analysis every three to five years, however, to update the estimates and extend the period of assurance over time.

Most utilities already have the information they need to make a reasonable estimate of their water system's future R&R needs. Using it, they can easily prepare a long-term funding plan to meet those needs, and gain their governing body's approval. If these simple steps are taken, our water communities will have taken a giant step towards assuring the sustainability of the infrastructure.

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Year	Work needed	Cost current dollars	Cost escalated at 3%
2011	Refurbishment A	58,000	68,239
2018	Refurbishments A and B	232,000	340,700
2026	Refurbishment A	58,000	106,314
2033	Refurbishments A, B, and C	406,000	928,899
2041	Refurbishment A	58,000	165,634
2048	Refurbishments A and B	232,000	826,968
2056	Refurbishment A	58,000	258,052
2063	Replacement	1,160,000	6,441,945
2071	Refurbishment A	58,000	402,037
2078	Refurbishments A and B	232,000	2,007,268

Re-investment needs of a 2-million gallon above-ground steel reservoir installed in 2003.