Prediction for Capital Recovery| LinkedIn (2013)

Prediction for Capital Recovery

By
Branko Terzic

Hydrogen fueled power pants, small modular nuclear reactors, utility scale storage, new transmission hardware and a variety of other new technologies are desired, and expected to be introduced, in the near future, into America's electric grid. These and other, yet uncommercialized, technologies are required for the energy transition. In some cases, these anticipated technological improvements may accelerate the removal of existing obsolete plant assets and equipment. Clearly, as old equipment reaches the end of its economic life it needs to be retired and fully depreciated on the books of the regulated utility by the retirement date. However, one problem facing public utilities and regulators is that existing depreciation rates for asset classes are based on service lives, salvage values and cost of removal that are out-of-date and a relic of the older technologies. Thus, retirements may take place before the equipment is fully depreciated. This mistake leads to the necessity of making decisions about what to do with “stranded costs”, of anything at all.

The correct regulatory response to the introduction of new technologies is to 1) update depreciation rates for existing older technology assets to reflect estimate replacement and 2) to use the most recent estimates of future services lives for the new technologies. In a simplified example, if the new assets (new technology) are expected to be installed in three years then depreciation practice requires that the unrecovered capital investment in current assets be recovered over the remaining life of the that asset, in this case three years. The old asset is retired because it is “technologically obsolete.”

However, changing depreciation rates (usually involving increased depreciation expense) is difficult to do at any time. It is particularly difficult to accomplish during periods of rising costs when every other element of the revenue requirement is also facing upward pressure. It is also difficult to do when fewer and fewer utilities and regulatory staff have trained depreciation experts on-board to monitor technology shifts and alert regulators and management to required changes. Technology will of course be a major driver of changing asset lives as transmission and distribution system components, frequently based on older mechanical and analog technologies, are replaced with digital and electronic equipment much more susceptible to rapid technological changes.

I was reminded of this need for replacement of old technology with while reviewing a reprint of Igor Bazovsky’s classic text “Reliability Theory and Practice” (Dover 2004, first published in 1961).

Reliability theory, in the engineering sense, studies sound design and scheduled maintenance to predict and eliminate component failures. It uses the mathematics of probability theory and statistics. In that usage it shares much with depreciation analysis of data of past equipment installations and retirements. Reliability theory and depreciation analysis also share common ground in that they both deal with the estimations of the “useful life’ of equipment and equipment components.

Bazovsky describes the Golden Rule of Reliability as: *“Replace components as they fail within the useful life of the components, and replace each component preventatively, even if it has not failed, not later than when it has reached its useful life.”*

Obviously Bazovsky is not calling for the full scale pre-mature dismantling of transmission lines and distribution systems. He is however reminding us that equipment does have a "useful life" that is likely much shorter than the ultimate physical life of the last item. This is the case where there are a large number of units such as meters, transformers, switches or other items prevalent in a complex system. All too frequently regulated depreciation rates rely too much on studies of the experienced retirement life of assets rather than the more appropriate projections of "useful" life. This is especially true when technological change is the driving factor.

The reason for this relates to the remark attributed to Yogi Berra that *"it's tough to make predictions, especially about the future."* Obviously, it is easier, as regulators, to look at statistics based on analysis of past data of equipment retirements than to understand economic and technological forces leading to expected obsolescence of equipment. But depreciation rates need to be based on the expected future service life of utility assets if service is going to be matched to the consumers' usage.

One depreciation factor is that of "extraordinary or functional obsolescence ". Professor James Bonbright in his <u>Principles of Public Utility Rates,</u> advises that:

In regulation, the allowances for depreciation both as operating expenses and as deductible reserves are designed to cover functional depreciation including obsolescence and not merely physical deterioration or wear and tear. Hence the allowances must be based on estimates or plausible assumptions as to the effect of obsolescence on useful-life expectancies. But neither a corporate management nor a commission can hope accurately to predict, years in advance of the event, dates as of which old properties may need to be retired for reasons of "extraordinary obsolescence".

The lack of historic data should not be a barrier to regulatory decisions to recognize the fact of obsolescence. The staff experts at the Wisconsin Public Service Commission discussed the situation when there was a lack of data in their 1930 book <u>Depreciation: A Review of Legal and Accounting Problems</u>:

Many companies do not have mortality data on property. Where there is a lack of such information, the only way the exhaustion of service capacity or accrued depreciation on an age and life basis can be measured is by judgment.... The life of the plant in service, however, is entirely a question of judgment.

No more explicit or stronger statement on the subject of the application of judgment can be found than the statement of the Depreciation Subcommittee writing in the NARUC Committee on Engineering, Depreciation and Valuation report <u>Public Utility Depreciation Practices 1968</u>.

Average service lives – This is the single most important component of the depreciation rate…The determination of this figure is an engineering function since judgment evaluation of the impact of present and future operating conditions and technological developments on the life of the plant is <u>required in addition to</u> mathematical and statistical analysis of past experience.

Thus, while regulators also face Yogi's difficulty of prediction, they also have access to the best engineering judgement available. In Yogi's case the issue may have been the outcome of a baseball game, in the state regulator's case, more is vitally at stake than the outcome of a ballgame.

The Honorable Branko Terzic is a former Commissioner on the U.S. Federal Energy Regulatory Commission and State of Wisconsin Public Service Commission, in addition he served as Chairman of the United Nations Economic Commission for Europe (UNECE) Ad Hoc Group of Experts on Cleaner Electricity. He hold a BS Engineering and honorary Doctor of Sciences in Engineering (h.c.) both from the University of Wisconsin- Milwaukee.

#BrankoTerzic #energy #regulations #experience #research #future #opportunity #strategy #management #people #electricity #power #utilities #future #renewables #RenewableEnergy #energysector #oilandgas #powergeneration #energyindustry #oilandgasindustry #sustainability