the fleet-wide average of 90.31. Dominion Energy anticipates submitting an SLR application for North Anna-1 and -2 in late 2020, and those reactors also have capacity factors above the median, at 92.56 and 92.03, respectively.

Looking for some respect

Plant owners have warned that more reactor closures are inevitable if market reforms are not enacted, including for some high performers that have already been the beneficiaries of investments in new plant equipment and aging management programs. A power reactor is a resource with longtime added value, yet plant owners—and, in some cases, state officials—are fighting for that value to be recognized, with apparent hope that the proverbial squeaky wheel will get the subsidies.

Sometimes, a fleet owner must fight the same battle in multiple states with different market conditions. And no two reactors are identical—similar reactors may differ by age, component condition, performance, operator, colocation with other reactors, or any combination of the above. Strong performance is no guarantee of survival.

Four states—Connecticut, Illinois, New Jersey, and New York—have passed laws establishing zero-emissions credit (ZEC) programs. New York's FitzPatrick got a new lease on life when Exelon purchased the plant from Entergy in 2017. Dominion's Millstone recently inked a 10-year power purchase agreement, won after the Connecticut Department of Energy and Environmental Protection deemed it at risk of early retirement. Exelon's Quad Cities and Clinton were the winning bidders through the Illinois ZEC procurement program. PSEG got word on April 18 that the New Jersey Board of Public Utilities voted to approve ZECs for Hope Creek/Salem.

Negotiations on the future of other plants have seemed to lead inexorably to closure. Oyster Creek's shutdown will be followed soon by Pilgrim's. Indian Point-2 and -3 are scheduled to close in 2020 and 2021, respectively, Arnold in late 2020, Palisades in 2022, and Diablo Canyon-1 and -2 in 2024 and 2025.

Exelon filed a decommissioning report with the NRC on April 5 for Three Mile Island-1, a perennial strong performer in the *Nuclear News* capacity factor survey, but the company stated that it won't begin decommissioning in September if legislation is enacted by June 1 (see p. 8). Separately, in financial reports filed in February, Exelon stated that certain Illinois plants—namely Dresden, Byron, and Braidwood—are "showing increased signs of economic distress, which could lead to an early retirement." Meanwhile, FirstEnergy is calling for market reforms in Ohio and Pennsylvania to keep its Davis-Besse, Perry, and Beaver Valley plants operating.

Each time a nuclear plant gets a reprieve, it's a gain for the nuclear industry and for clean energy. But it's an incremental gain. So too are the gains from power uprates, the start of operation of Watts Bar-2, and the expected starts of Vogtle-3 and -4 in 2021 and 2022. Capacity factor gains in recent years—measured to the hundredth of a percentage point—have also been incremental.

Maybe it should come as no surprise then that incremental fixes are the only fixes available for plants that are struggling economically. In the absence of support at the federal level for operating power plants, a patchwork of ZECs may be the best we can do. Yet today's operating plants are licensed for decades of steady baseload generation, and there is nothing incremental about that.

Can SMRs and microreactors, offering up electricity in per-reactor increments of anywhere from 1 to 300 MWe, give the grid the nimble, load-following electricity it's looking to buy? Time will tell. But electricity is electricity, and reliable baseload generation still has value. We need only look at the number of large LWRs under construction overseas to be reminded of that. **NN**