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Steam-powered energy systems, like the one used by West Haven VA hospital, have long history

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The VA Connecticut Healthcare System in West Haven.

Photo: Liz Teitz / Hearst Connecticut Media file photo

An accident that killed two people at the Veterans Affairs medical center in West Haven earlier this month has drawn steam-powered energy systems into the spotlight.

The investigation into the cause of the Nov. 13 incident is continuing, but state police investigators already are saying super-heated water vapor “rapidly filled the room and

The state police investigation found there was no fire or explosion. VA officials have said workers replaced a leaking steam pipe in the outer building on the campus and the accident occurred as the line was refilled with steam.

Details regarding how the steam system at the hospital operates and how long it had been running were not immediately available from VA officials. But Robert Wilkie, U.S. secretary of Veteran's Affairs, promised following the deadly accident that "changes are coming soon" to the West Haven system's infrastructure.



Veterans Administration Secretary Robert Wilkie addresses last Friday's fatal construction accident at the VA Connecticut Medical Center in West Haven, Conn. on Tuesday, November 17, 2020.

Photo: Brian A. Pounds / Hearst Connecticut Media

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federal funding to address aging VA facilities nationwide.

He noted, “obviously this one [in West Haven] will be at the very top of the list.”

But Wilkie said is unlikely there will be a transition away from steam power.

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.S. Senator Richard Blumenthal (left) listens to Alfred Montoya, Jr., medical director of the VA Connecticut Healthcare System, speak at a press conference following an explosion at the boiler plant at the West Haven VA Hospital that took two lives on Nov. 13, 2020.

“Most of the government runs on steam,” he said.

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then is distributed through a network of pipes to a group of buildings.

In the era of nuclear power and natural gas-fired power plants, some energy experts regard steam-powered systems – used to heat and cool buildings and in some cases provide electricity – as an anachronism.

“They are lower efficiency than the technology that is out there today,” said Joel Gordes, a West Hartford-based energy consultant. “Kilowatt for kilowatt, a combined cycle gas turbine is going to be more efficient.”

But according to a 2019 estimate from the U.S. Energy Information Administration, there were more than 660 district energy systems operating in the U.S. at the time, with installations in every state.

And there is evidence that district energy systems are reliable: A 2019 report by the U.S. Department of Energy found district energy operations at University of Texas’ Austin campus have had only four hours of unscheduled interruption over the last 35 years.

District systems operating in Connecticut

“District energy systems are more commonly found in commercial clusters of buildings such as colleges, hospitals, downtowns, healthcare, and government campuses,” according to a 2018 report by the U.S. Energy Information Administration (the statistical and analytical agency within the federal energy department) The report notes that in 2012, “an estimated 5.5 billion square feet of heating floorspace and 1.9 billion square feet of cooling floorspace were serviced by district energy.”

Yale University has a district system that, according to the school’s website, uses three power plants and what is known as the Central Campus Chiller Plant. These plants generate and distribute steam for heating, chilled water for air conditioning and electric power using underground distribution systems.

Portions of downtown Hartford have run on steam since 1962. The Hartford Steam Co. now serves 47 buildings, according to the company’s website.

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area is Bushnell Park and the eastern edge is Interstate 91.

And some buildings that house state offices have district energy systems, according to a spokesman for the Connecticut Department of Administrative Services.

John McKay of DAS said the agency oversees the Capitol Area System, a pipeline the state owns, which sends hot and chilled water to 13 state-owned and 5 private buildings in the Capitol District.

The energy supply comes from a natural gas-fired power plant at 490 Capitol Ave. in Hartford that is owned by a Syracuse, N.Y., company, PureEnergy. McKay said the plant utilizes steam boilers to manufacture steam.

“It is sent our pump house and the steam is then condensed into hot water and services our buildings,” he said.

“There is (also) an exception in that the Capitol Avenue Complex is directly fed from the plant with steam and we utilize steam to heat the Capitol Avenue Complex (which houses the state’s Office of Policy Management, Department of Social Services, Department of Public Health and the Office of Health Strategy),” McKay said.

Perhaps the best-known district energy system operating in the United States is run by Consolidated Energy of New York.

Con Ed’s district energy system covers an area from The Battery to 96th Street in Manhattan and serves about 1,000 customers, according to Robert McGee, a spokesman for the utility.

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Consolidated Edison's 59th Street Steam Station located on New York City's West Side.

Photo: Contributed photo /

Con Ed's district system provides heating and cooling for some of New York City's best-known locations, including the United Nations Building, the Empire State and Chrysler buildings, the Metropolitan Museum of Art and a number of the city's hospitals.

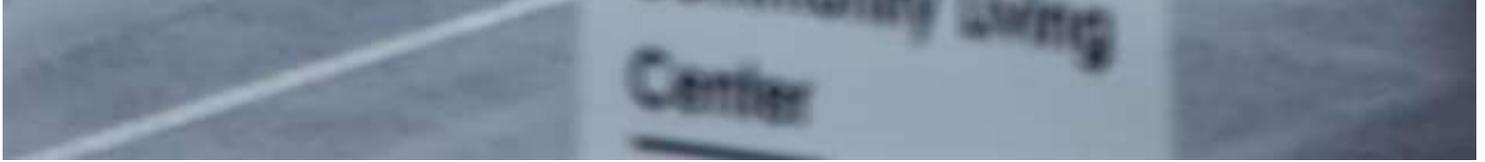
To serve those customers, Con Ed has several strategically placed steam-generating plants on Manhattan's West Side as well as one near FDR Drive and the United Nations on the East Side, McGee said. It also has a steam-generating plant in Brooklyn, which can send steam into Manhattan, he said.

Benefits and Concerns

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The scene outside of the boiler plant at the West Haven VA Hospital following an explosion earlier in the morning on Nov. 13, 2020.

Photo: Arnold Gold / Hearst Connecticut Media

McGee said district energy is beneficial to the city's environment.

"It's one of the reasons why New York City's air is so clean and that you don't have smokestacks all over the city," he said.

"And if you are in a dense urban area, the last thing you want is oil trucks clogging up your side streets," he said.

McGee said district energy also is convenient to the property owners who are customers of the utility.

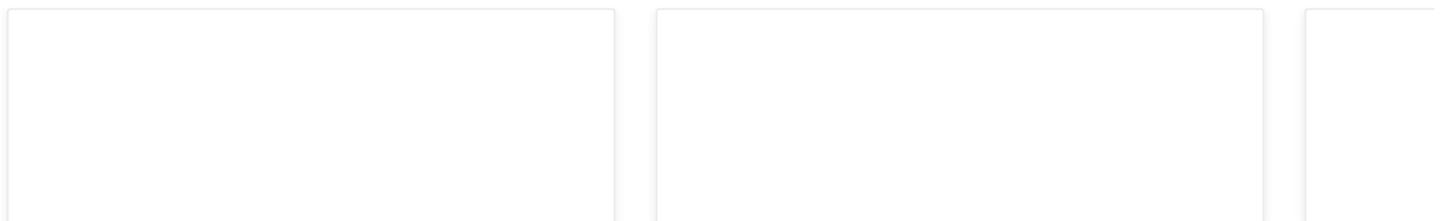
"Those buildings that do rely on it don't need a large physical plant in the building to serve its tenants," he said. "Given the value of Manhattan real estate, that's important. It's basically a turnkey operation brought into the building through a set of pipes."

But McGee acknowledged district energy systems are no different than any other way energy is delivered when it comes to safety.

"Safety is always paramount in our business," he said. "Energy in whatever form it is conveyed presents some risks.

"It our job to reduce that risk," he said.

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McKay, with Connecticut's Department of Administrative Services, said state officials take "building maintenance and safety very seriously and make every effort to keep our facilities maintained and running."

Con Ed's most recent explosion of a portion of its district energy system that resulted in injuries occurred in July 2016 in Manhattan's Flatiron District.

Five people suffered minor injuries in that incident.

Robert McCullough, managing partner of McCullough Research of Portland, Ore., said there is nothing inherently dangerous in the operation of district energy systems.

He said Portland had one district energy system that operated for nearly 100 years before being retired in 2000.

"There's really nothing wrong with them," he said. "But steam is a little harder on the distribution system and is a little less efficient."

The pressure associated with creating steam "is harder on a system's piping as it gets older," McCullough said.

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Replacing the piping and boilers district systems requires is not cost-effective and, as a result, the systems are being replaced with new technologies over time, according to McCullough.

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