

WindAction Editorial

Getting serious about setbacks

<http://www.windaction.org/faqs/29334>

(Posted October 1, 2010)

This week, utility giant National Grid [teamed up with Nantucket High School](#) in Massachusetts to erect a 100 kilowatt wind turbine on school property. The 190-foot turbine is located immediately adjacent to the school's football and baseball fields and by the road that runs behind the school.

According to the [Nantucket Independent](#), the high school originally proposed locating the tower immediately west of the Newtown Cemetery to provide for an adequate "fall zone" but the plan changed after concerns were raised about the visual impact of the tower on the historic burial ground. The turbine was moved to its present location.

[This aerial image](#) of the school sports fields shows a circle with a radius of approximately 50 feet to denote the location of the turbine.



Apparently, the school reconsidered the need for a safety zone which would have to be at least *four times* that size.

Perhaps they were unaware of the three turbine collapses in the Northeast alone since September 2008.

In one of these instances, the turbine detached [at its base](#) and fell full-length in a field. In another, the turbine malfunctioned, went into over speed. When the spinning blade hit the tower and [the turbine exploded](#) to the ground. Firefighters were called out to extinguish flames caused by the collapse.

[Catastrophic failures](#) are more common than the public has been led to believe. In 2009, three small-scale turbines at the Perkins High School in Ohio [sent blades flying](#) after a wind gust apparently caused a blade to flex and hit the support pole. Earlier this year, two turbines sited on Cape Cod in Massachusetts [blew apart in high wind](#) conditions. Many more incidences of fire, blade throw, and collapse have been documented.

GE Energy [explains](#) that we do not have a good understanding of what happens to turbines when operating in extreme wind conditions. If GE is recommending caution it would be prudent to understand the risks other manufacturers are citing. The coastal areas of New England are well known for severe wind and weather conditions.

Ice shedding is a separate but real issue. According to GE Energy's Wind Application Engineering Group, wind energy production in cold climate provides the following formula for [calculating a safe distance](#): $1.5 * (\text{hub height} + \text{rotor diameter})$. Based on this formula, the Nantucket high turbine could fling ice nearly 400-feet away, well into areas where students play and gather. [This e-mail](#) characterizing ice-shed at the Searsburg, Vermont wind facility provides some insight into the problem. (Note: the turbines at Searsburg are about the same size as the high school's at 198-feet).

It's hard to imagine the parents whose teenagers attend Nantucket High School were aware of the risks of siting a turbine so close to populated areas. And the question of safety must have been just a fleeting thought for school officials since they agreed to the present location.

Unfortunately, the [Massachusetts Renewable Energy Trust](#) (now part of Massachusetts Clean Energy Center) is silent on the safety question.

When Windaction.org asked about setbacks in reference to the [Newburyport, MA](#) turbine, also funded by the Trust and sited close to homes, we were informed by e-mail that: "Massachusetts Renewable Energy Trust's goal is to support the installation of renewable energy projects and expansion of the clean energy industry in Massachusetts for a cleaner environment and stronger economy. The Trust evaluates projects at a high level and seeks to support projects that have a high likelihood of success and are deemed suitable by the communities in which they are located. The Trust is not a permitting agency; rather, permitting decisions for wind turbines are in the hands of each community."

There is a consistent pattern across the U.S. of small communities approving wind turbine proposals with little consideration, or apparent understanding, of the serious safety risks of erecting towers near public areas, rights-of-way, and residences. It surprises us that the insurance industry has not responded to the heightened risks. Hopefully, we will not see persons injured, or worse, before those making the decisions start taking the risks seriously.

(Note: The distances referenced in this editorial pertain to the risks of flying debris from operating turbines. Setbacks to mitigate for turbine noise, shadow flicker and visual impacts are not considered.)



[Link #1]

Photo by Jim Powers
Brian Geary, left, and Mike Rotondo of Alteris Renewables work 120 feet above the ground to secure the blades of the wind turbine being built at Nantucket High School of Wednesday morning.

ReMain, National Grid team up to erect wind turbine at NHS

By Peter Martin 9/30/10
Nantucket Inquirer & Mirror Staff Writer

Rising above the Nantucket High School football field and dominating the skyline in the center of the island is the newest green initiative on Nantucket, a 120-foot tall, three bladed windmill that will partially power the school as well as inspire a whole new generation of islanders to “think green.”

Northern Power Systems, a Barre, Vt. company, began installing a 100 kW turbine at the end of the football field nearest the school on Monday.

“We’re trying to help the school financially,” said Dave Fredericks, National Grid’s Vice President of Operations for Southern New England. “But we also want to get the kids excited about the discussion. I don’t know if wind will be the answer, but we want the kids to start having discussions about the future of energy.”

Fredericks spearheaded the project on the island following discussions with Wendy Schmidt, the president of ReMain Nantucket and the Schmidt Family Foundation. She along with her husband Google CEO Eric Schmidt partly funded the \$600,000 project, along with money from the state.

Construction on the project truly began in August when the power lines and foundation were put in place, but it wasn’t until Monday that the pieces were transported to the island and construction began on the structure in earnest.

The structure was completed on Wednesday morning when the turbine and blades were attached to the top of the structure. It will likely be spinning this week as the structure and its’ safety mechanisms are tested, and the turbine should be producing power for the school by next week.

(excerpt of full article ...)

[Link #2]

High School wind turbine goes up next week

By Peter B. Brace

[Nantucket Independent](#)

Posted Sep 24, 2010 @ 11:30 AM

By early October, Nantucket High School's wind turbine should be generating electricity both to stimulate young minds about renewable energy and augment the school's power supply.

The turbine, coming from New England-based Alteris Renewables, stands 190 feet tall and is a 100-kilowatt wind power generator. It is sprouting from behind the baseball backstop adjacent to the road running behind the school through a collaboration of the high school student group, Students for Sustainability, National Grid and the Schmidt Family Foundation. Dave Fredericks, a vice president at National Grid said he expects the turbine to arrive on the island on Sunday.

"Over the last week we have finished all the foundation work and have run the electrical connections. We really are sitting back waiting for the delivery of the turbine itself," said Fredericks. "The week of Sept. 26 it gets delivered, and it should be installed on Sept 27, 28 and 29. I would hope it would be making power in early October."

Wind power at the high school gained traction from Fredericks' informal discussions with Wendy Schmidt of the Schmidt Family Foundation. When Fredericks floated the idea of putting up a wind turbine on school property for educational purposes, Schmidt jumped at the chance to help out. Fredericks then offered his energy expertise as a citizen of the island.

The high school originally proposed a location for the turbine immediately west of Newtown Cemetery off Sparks Avenue and between the baseball field and the football field. Because the Historic District Commission would not support placement so close to the cemetery, the location was changed. Fredericks had wanted the turbine closer to the cemetery to give it an adequate fall zone, the area around it in which the structure could topple without damaging any other structures or property. But the commission said the wind turbine would visually affect the historic nature of the cemetery, said Fredericks, so we moved it over about 200 feet closer to the school.

The cost of the project, just under \$500,000, is being covered by several sources including \$165,000 in grants from the state, \$435,000 from the Schmidt Family Foundation and \$25,000 in goods and services from island businesses. This total puts the project approximately \$11,000 short; however, the Board of Selectmen, which agreed to help pay part of that shortfall, approved \$2,500 in funding for the project at its meeting on Sept. 8.

Fredericks said he expects this wind turbine to cover 20 to 25 percent of the high school's electric demand, which equals around \$30,000 in annual savings.

"But its real value is that it allows the kids to get actively involved in what these choices mean," said Fredericks.

[Link #3]

<http://www.windaction.org/pictures/29335>

[Link #4]

Fenner wind turbine collapse, aerial image

December 27, 2009

Credits: Ryan Petersen

Description:

A 329-foot wind turbine, base to blade tip, collapsed early Sunday morning, December 27, at the Fenner wind farm in Fenner, New York.



[Link #5]

Noble Environmental turbine collapse

March 6, 2009

Credits: Michael Fellion

Description:

The Altona wind energy facility which went on line in early 2009 lost a turbine due to collapse. The project consists of 65 GE 1.5 MW turbines. No explanation for the collapse has been released. The turbine caused a fire when the nacelle hit the ground.



[Link #6]

see website:

<http://www.windaction.org/pictures/c51/>

[Link #7]

[The Morning Journal](#) Serving Northern Ohio

Blade breaks off wind turbine

Tuesday, February 10, 2009

By RICHARD PAYERCHIN rpayerchin@MorningJournal.com



PERKINS TOWNSHIP — Three wind turbines have stopped spinning because the blades on one of them broke apart on Saturday afternoon outside Perkins High School.

No one was hurt when parts of the fiberglass blades came off the turbine as it spun, winging the blades up to 40 yards away from the silver monopole tower, near the high school at 3714 Campbell St.

The remaining two will not spin until they are inspected and officials figure out exactly what caused the blades to break.

"We're still waiting for a complete investigation to try to determine what went wrong," said Perkins school Superintendent Jim Gunner.

"First and foremost, we've got to figure out what happened," he said. "Once we know what happened and we can safely put the two other turbines back on line, we'll do that."

Based on initial reports and photos, it sounded as though a wind gust may have caused one of the three spinning blades to flex and hit the monopole, said Joseph Ianni, chief executive officer of

turbine maker ReDriven Power Inc., based in Iroquois, Ontario.

Hitting the pole could cause the blade, which is made of fiberglass with a foam core, to break and in just a few rotations throw off the balance of the three spinning blades, causing them also to hit the monopole, Ianni said. He cautioned all speculation was preliminary and no ReDriven workers had seen the blades, which were being stored at Wilkes & Co.

"We haven't seen this particular problem occur in the past at all," Ianni said. ReDriven has about 30 of the 20-kilowatt turbines in the field and a sales network of about 100 dealers in the United States, Canada and Europe.

Based on a preliminary examination, it did not appear the monopole or its foundation were damaged, Gunner said. The turbines are geared to start generating power with wind speed of about 4 mph.

Yesterday, Gunner convened Perkins Building and Ground Maintenance Supervisor Greg Linkenbach, Honeywell consultant Chris Hess, Wilkes & Co. Vice President David L. Rengel and John Fellhauer, of Fellhauer Mechanical Systems Inc.. to begin examining the blades, turbine and tower.

Rengel and Linkenbach said they were out at the turbines on Saturday and everything appeared in working order. A ReDriven worker also was at the site last week as the turbines were hooked up to the schools' power network, Ianni said.

The three turbines were installed Jan. 23 as part of major renovations designed to save on energy bills in Perkins Local Schools.

The turbines' electrical connections were hooked up and ready on Wednesday to begin generating power for the school, its field house and maintenance shop, and nearby Briar Middle School.

However, Saturday — with winds gusting out of the south — was the first day truly windy enough to test the machines.

The turbines became an attraction, with curiosity seekers driving into the high school parking lot to see the three, whose rotating 20-foot blades sometimes appeared to be synchronized, the officials said.

"It was kind of like a community event, people coming through," Rengel said. "Everybody was impressed. They said, 'Geez, these things are quiet. They look neat.'"

One 4-foot section of a blade was found in the high school student parking lot, where it hit about 20 yards away from the pole, then skidded another 20 yards, Gunner said. Another was almost directly beneath the turbine, while the third piece sailed about 25 to 30 yards into the end zone of Perkins' football stadium.

The other two can be shut down by creating an electric load within the generator, essentially locking the blades into place. The turbines also then turn to be off the direction of the wind, Rengel said.

[Link #8]

Cape turbine failures during storm stir up concern

By [Doug Fraser](#) Cape Cod Times

March 16, 2010 2:00 AM

When the 100-foot-tall wind turbine at Bartlett's Ocean View Farm hurled one of its broken blades nearly 200 feet Jan. 18, it was a statistical anomaly. Wind energy experts claim, and statistics seem to show, failure rates are low.

But when a second 100-foot-tall turbine, this time in Marstons Mills, shed its blades in a northeaster this Sunday, it seemed to some the start of a troubling trend.

That is especially relevant as the Cape sees an ever-growing demand to add more wind power, whether in people's backyards and businesses or on municipal property. Then, there's the 130-turbine project in Nantucket Sound.

"There's a growing interest in (turbines) because a lot is being paid for by public dollars," said Lisa Linowes, executive director of Industrial Wind Action Group. The New Hampshire-based national advocacy group is pushing for more analysis of cost, danger and benefits of wind energy.

Linowes said there are better places to locate turbines than in New England's harsh coastal environment.

"There's only so much testing going on with (wind turbines), and the different environments they are being sited in pushes them to the limit," she said.

Gusts of 60 MPH

This weekend, the gusting winds, at times measuring over 60 mph, prompted Conrad Geyser to check in on the turbine he owns at Peck's Boats Inc. on Route 28 in Marstons Mills.

"I was looking and listening, and I didn't see anything off the chart," he said yesterday. "The thing was going like crazy and moving around a lot, but nothing any more extreme than we'd seen already."

Geyser said he believes sometime in the early morning Sunday a big gust may have hit especially hard and knocked the blade tips off. He's not sure how far they landed from the tower. Wind turbine blades can be subjected to enormous pressures, especially in the Cape's notoriously stormy weather.

"They're light," he said. "But anytime you have something falling from the sky, there is concern."

Of greater concern are the relatively heavy blades on larger models. But, of course, the larger the turbine, the greater the level of sophistication and safety features built in to avoid just such a scenario.

Hyannis Country Garden installed its 126-foot-tall wind turbine in 2008. It sailed through last weekend's storm without incident.

Specially designed software monitors wind conditions and applies brakes to slow the spin of the blades if the wind speed exceeds design criteria for efficient and safe power generation.

If the wind hits storm levels with sustained winds of over 50 mph, with gusts up to 60 to 80 mph, the computer begins shutting down the turbine, and the brakes can stop the rotation within a couple of spins.

The turbine performance, blade spin and weather conditions are also monitored remotely by technicians in Vermont. The computer sends an e-mail alert if it detects any major aberration.

"I feel this is a safe machine," said Country Garden owner Diana Duffley. She researched and purchased the Northwind 100 in part because the property is in a relatively densely populated area.

Five miles offshore

The same cannot be said of Cape Wind, whose 130 towers would be 258 feet tall, with blade tips stretching up to 410 feet; the turbines would be more than five miles from shore in Nantucket Sound. The technology, proponents insist, is much more sophisticated than that of smaller turbines. They insist blade failures are rarely, if ever, seen.

"These are things that have not happened in offshore wind (power)," said Cape Wind spokesman Mark Rodgers. As evidence, he offered that large-scale turbines are online, producing power, 98 percent of the time the wind is blowing.

"Large turbines rarely have failures," said John Dunlop, a senior project engineer with the American Wind Energy Association. Technology, he said, has changed dramatically in the past decade.

Where turbine blades used to be fixed to the hub, they now can be rotated so that, in storms, they actually dump wind and become less efficient. Much as a sailor lets out the mainsail to avoid capsizing in a gust, the blades pivot to offer less surface area to the wind.

They do this because the turbines that produce the electricity reach full capacity in a 25 mph wind. By feathering the blades, and using brakes, the turbine can continue to produce power with less strain than a rapid spin would cause.

"There's less stress because they're only extracting the amount of energy it takes to reach capacity," Dunlop said.

When winds reach 50 to 60 mph, he said, the leading edge of each blade faces into the wind, presenting the smallest profile, and the brakes hold them in place.

Extreme force

But some critics say the larger size and greater sophistication don't guarantee faultless performance.

"While the larger turbines may be manufactured more solidly, the force of having blades that are 165 feet long is extreme," said Audra Parker, executive director of The Alliance to Protect Nantucket Sound.

Parker said the recent incidents involving smaller turbines are warnings of what could happen in Nantucket Sound.

"What happens if you do get a blade throw with ferries passing within two-tenths of a mile?" she asked.

But Industrial Wind Action's Linowes thought the chance of a blade from an offshore wind turbine striking anything was pretty slim.

She was far more concerned about what she's seeing on land.

"It's tough to justify these projects being built 1,000 feet from a home," she said.

[Link #9]

[see PDF]

[Link #10]

[see PDF]

[Link #11]

Ice shedding from turbines and public (e-mail)

March 9, 2008 by John Zimmerman (VERA)

Summary:

Here is a reprint of an email about ice throw at Green Mountain Power's Searsburg wind energy facility in Searsburg VT. The email was written by John Zimmerman to an American Wind Energy Assoc. listserv in 2000. Mr. Zimmerman managed the development of the Searsburg facility.

E-mail from Randy Swisher (AWEA)

Date: Thursday, February 26, 2004 6:37 PM

Fwd: Re: Ice shedding from turbines and public

Katie,

Here is a comment from John Zimmerman. He states that wind turbines don't belong at ski areas, but I think it is really just a question of what is the appropriate setback. John describes some of

the ice they've seen at the Searsburg site and it sounds pretty intimidating but manageable with proper setbacks.

I think that is the last of the information I have on the topic. It isn't a lot, but I hope you find it helpful. Please let me know if you need anything else, and feel free to consult our web site at www.awea.org as well.

Thanks again for your interest. I hope next time I'm riding my bike in the Northeast Kingdom I will actually have a chance to see a few wind turbines!

Randy Swisher

From: "John Zimmerman"

To: Vindpet~groups.com> AWEA / John

Date: 20 Jan 2000 10:51:43 -0500 Zimmerman (Vera)

Organization: VERA Icing

Subject: [a-w] Re: Ice shedding from turbines and public safety

Jim and Peter,

I've watched over the wind turbines GMP [Green Mountain Power - Searsburg] has had installed in Vermont over the last 10 years and have several thoughts that be useful to this discussion.

Here in Vermont, and elsewhere in the northeastern US, the winds blow at the strongest at the mountain tops, where it is also the most icy. A common first question to wind developers in this region is 'why don't you put the wind turbines at the ski areas (where there already is human development)'? The answer is because of the danger to public safety due to ice throws. Ski areas are not a good place for wind turbines.

Back in the mid 1980s one of the windy areas that was being considered for wind development was near to ski trails. Boeing and/or Hamilton Standard did some work to determine how far we must stay away from the ski trails to be safe from ice being thrown from their turbines (the MOD 5b was the boeing machine at the time). Without going back to dig up those papers, and if I remember correctly, the distance was between .25 and .5 miles away, downwind. It's a function of blade tip speed, so applicable to present day turbines too.

While the Boeing study was academic, the danger from ice being release from rotor blades overhead is real -- and a hard hat is not going to provide you with much comfort. I have stood near the turbines GMP had on Mt. Equinox in the early 1990s and more recently the Zond 500 KW turbines in Searsburg Vt during and after icing events. When there is heavy rime ice build up on the blades and the machines are running you instinctually want to stay away.

They roar loudly and sound scary. Probably you would feel safe within the .5 mile danger zone however.

One time we found a piece near the base of the turbines that was pretty impressive. Three adults jumping on it couldn't break. It looked to be 5 or 6 inches thick, 3 feet wide and about 5 feet

long. Probably weighed several hundred pounds. We couldn't lift it. There were a couple of other pieces nearby but we wondered where the rest of the pieces went.

In the winter, icing is a real danger and GMP therefore restricts public access to the site(s). Maintenance workers have developed a protocol for working on turbines during icing conditions, though I am not familiar with the details. I'll 'dig into it' if you want.

Regards,
John Zimmerman
VERA

[Link #12]
Renewable Energy Trust

If you need to contact a staff member of the Renewable Energy Trust, call (617) 315-9355 and follow this [link >>](#)

ANNOUNCEMENT

Dear friends,

As of November 23, 2009, the Massachusetts Renewable Energy Trust has joined the [Massachusetts Clean Energy Center](#). This exciting transition comes as a result of legislation, passed by the Massachusetts Legislature and signed by Governor Deval Patrick, to provide the residents, businesses, and communities of the Commonwealth with a single source of support for clean energy. [View press release>>](#)

We are working to ensure a seamless transition for Trust award recipients and renewable energy stakeholders. During this transition and beyond, the Renewable Energy Trust and the Clean Energy Center will continue to provide the same high level of service to the ratepayers of the Commonwealth, and will work to further Massachusetts' position as a leader in the clean and renewable energy economy. We thank the Massachusetts Technology Collaborative for their many years of stewardship of the Trust, and look forward to continued partnership and future success in catalyzing the Massachusetts innovation economy.

Over the next several months we will be transitioning our webpages to the Massachusetts Clean Energy Center. Meanwhile, MTC will continue to host our webpages.

Thank you for your continued interest in and support of the work of the Renewable Energy Trust, and for your commitment to making the Commonwealth a leader in clean energy.

Sincerely,
Carter Wall
Executive Director
Massachusetts Renewable Energy Trust

[Link #13]

Newburyport (MA) Daily News
September 11, 2008

[Neighbors of proposed turbine file suit](#)

By Lynne Hendricks

NEWBURYPORT — Erecting the city's first 600-kilowatt wind turbine just got a little tougher for Mark Richey Woodworking of Parker Street, as two neighbors living in the vicinity of his proposed turbine site have filed a complaint with Essex County Superior Court to overturn an Aug. 13 Zoning Board of Appeals decision granting a special permit for the turbine construction project.

According to Newburyport's newly adopted ordinance governing wind turbines, residents have 20 days from the date of permit issuance to file complaint. Plaintiffs Scott and Caroline Blackman of 16½ Hill St., and Daniel and Sheila Twomey of 16 Hill St., submitted theirs on Sept. 5, saying procedural protocol was not followed by the applicants and therefore the application should have been denied.

Foremost among several complaints, the Blackmans and Twomeys contend Richey neglected to file public notice of a July balloon test intended to demonstrate to residents and interested parties the height of the future turbine. Advertising of the testing date is not required by state law, but is a requirement written into the City Council's newly adopted wind turbine ordinance. Richey said yesterday the public notice of the balloon test was something he thought had been carried out by the city, but it was becoming clear there was no record that such a notice was published.

"It was certainly our intention, and our lawyer Lisa Mead was explicit," Richey said. "City Hall had responded they would take care of it. We assumed it would happen."

Since Richey's proposal represents the first special permit of its kind to be granted by the ZBA under the ordinance, Planning and Zoning Department Administrator Emily McCourt said this procedural step may have been missed as the test date drew near.

"It was a new ordinance, so the process was different than all our other applications," McCourt said. "That may have played into it. It's not a state requirement, but our local ordinance requires that extra advertisement."

Mark Richey did say notification was sent out to the Zoning Board of Appeals, and abutters of his Industrial Park property, and he clarified the residents lodging the appeal are not legal abutters though their properties are located near the proposed site. He and ZBA Chairman Edward Ramsdell feel the spirit of the notification requirement may have been met regardless, especially in the case of the plaintiffs.

"One of the tests is, whether or not individuals received sufficient notice," Ramsdell said. "Were they notified? I think it seems to me some of the people in that suit were at the hearings prior to the balloon test, where the balloon test was announced, and in fact came to the hearing with

photographs of the balloon test. If they were at the meeting before, where it was announced, and they came to the meeting afterward with photographs of it, it would seem they had notification. But I'm not the courts. That's what the appeals process is for."

Richey and his team were originally shooting to complete the turbine project by December, and he still hopes to meet that deadline. Written into the city's turbine ordinance is the right of the permit holder to proceed, realizing the risk of not winning the appeal.

"We certainly hope to stay on track with the project," Richey said. "We have the option to build at risk, which we may choose to do. We might just keep going."

The complainants cite as grounds for ZBA reversal several issues beyond the absence of public notification, such as the flashing red beacon light required by FAA for structures of significant height, the "flicker" phenomenon sometimes created on abutting properties that coincide with certain weather conditions, and the visual impact the turbine would have on the surrounding community.

"Plaintiffs submit that their property values will be negatively affected by the adverse impact of this wind turbine on the visual character of their neighborhood," reads the civil complaint.

Having considered the above complaints, the plaintiffs contend Newburyport's ZBA issued the permit without considering "the adverse impact of the wind turbine on the visual character of the plaintiff's neighborhood."

Ramsdell disagrees with that assertion.

"Obviously I think it was a vetted decision," Ramsdell said. "I think the decision was well done and well founded — that's my opinion. But they have a perfect right to appeal — that's how the system is set up."

For his part Richey said there are a number of avenues he's considering at this point, including holding another balloon test if necessary.

"(The test) in itself is not a huge issue," Richey said. "If we had to, we'd perhaps do the balloon test again."

It's Richey's plan to make his woodworking business completely energy self-sufficient, and he is prepared to accomplish that at whatever cost.

"We'll fight to the end," he said. "We're well within the zoning ordinances which were written for the city. We did all our homework and all our studies, and did everything correct. But it's an appeal and you have to deal with it."