

**From:** [Mary Lampert](#)  
**To:** [Guzman, Richard](#)  
**Cc:** [NRCExecSec Resource](#)  
**Subject:** [External\_Sender] SUPPLEMENT NO. 1 TO PILGRIM WATCH, CAPE DOWNWINDERS AND THE TOWN OF DUXBURY NUCLEAR AFFAIRS COMMITTEE 2.206 PETITION TO MODIFY, SUSPEND, OR TAKE ANY OTHER ACTION TO THE OPERATING LICENSE OF PILGRIM STATION UNTIL THE NRC CAN PROVIDE RE...  
**Date:** Monday, July 13, 2015 10:08:33 AM  
**Attachments:** [SUPPLEMENT TO 2 206 PETITION EMERGENCY PLANNING PW CAPE DOWNWINDERS DNAC 07 .13.15.pdf](#)

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Hello:

Attached please find SUPPLEMENT NO. 1 TO PILGRIM WATCH, CAPE DOWNWINDERS AND THE TOWN OF DUXBURY NUCLEAR AFFAIRS COMMITTEE 2.206 PETITION TO MODIFY, SUSPEND, OR TAKE ANY OTHER ACTION TO THE OPERATING LICENSE OF PILGRIM STATION UNTIL THE NRC CAN PROVIDE REASONABLE ASSURANCE THAT ADEQUATE PROTECTIVE MEASURES BASED ON ACCURATE INFORMATION CAN AND WILL BE TAKEN TO SATISFY THE NRC'S OBLIGATION TO PROTECT PUBLIC HEALTH & SAFETY.

If you have difficulty downloading the document, please call Mary Lampert at 781-934-0389.

Acknowledgement of receipt by return email appreciated.

Enjoy the day.

Mary

July 13, 2015

Executive Director for Operations  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
By Email: [NrcExecSec@nrc.gov](mailto:NrcExecSec@nrc.gov)

**SUPPLEMENT NO. 1 TO PILGRIM WATCH, CAPE DOWNWINDERS AND THE TOWN OF DUXBURY NUCLEAR AFFAIRS COMMITTEE 2.206 PETITION TO MODIFY, SUSPEND, OR TAKE ANY OTHER ACTION TO THE OPERATING LICENSE OF PILGRIM STATION UNTIL THE NRC CAN PROVIDE REASONABLE ASSURANCE THAT ADEQUATE PROTECTIVE MEASURES BASED ON ACCURATE INFORMATION CAN AND WILL BE TAKEN TO SATISFY THE NRC'S OBLIGATION TO PROTECT PUBLIC HEALTH & SAFETY**

**I. INTRODUCTION**

Petitioners present this supplement to support the petition's request that "The NRC should require, by agreement or amendment of its operating license that Pilgrim is required to do a precautionary shut down when severe weather conditions are forecast or present."

It is clear that any time state government institutes a travel ban or travel restrictions for Southeastern Massachusetts this should apply. In addition, should travel conditions significantly reduce speed, visibility, and road quality, this directive should be implemented. NRC should create a clear policy as to when and how this order would be issued. Implementing this policy is not suggesting that every significant storm would create a public safety issue at Pilgrim. It is acknowledging that if any public safety issue did arise during such an event, either related to weather or coincidental, neither the state nor the local community would be able to implement the evacuation and emergency response procedures it is required to have in place. This is especially important in consideration of the following:

- The number of loss of power events at the station indicating occurrence during severe weather storms.
- The vulnerability of Pilgrim's Station's switchyard and likely ineffectiveness of Entergy's proposed fixes.
- The probability that there is no reasonable assurance of a timely evacuation in severe storm conditions as demonstrated by petitioners in the discussion of winter storm Juno.

## II. Argument

### A. Pilgrim Station's Loss of Offsite Power Events

Since 1972, Pilgrim has experienced twenty-one LOOP failures during its forty two years of operation. Fifteen (74%) of these were weather related, eight of the fifteen weather related (38%) were caused by Nor'easters presenting blizzard conditions, severe weather being the so called BDBEE.

Each of the eight Pilgrim LOOP emergency shutdowns caused by the blizzard conditions during Nor'easters began with electrical faults and equipment failures in Pilgrim's switchyard. These switchyard events were characterized as "flashovers" meaning electrical faults, arcing and sparking, and required varied degrees of intervention by the Plymouth Fire Department. The most recent example occurred this past winter on January 27, 2015 during Juno which caused an unplanned automatic shutdown that was complicated by subsequent failures of at least three additional pieces of critical equipment and systems during shutdown.

### B. Vulnerability of Pilgrim's Station's Switchyard – Flashovers during Severe Storms

#### Record

- **Feb 06, 1978 (Nor'easter/Blizzard - Blizzard of 78)** - The reactor automatically scrammed when heavy snowfall caused electrical breakers in the 345 kilovolt switchyard to **flashover** and trip.
- **Feb 13, 1983 (Nor'easter/Blizzard)** - With the reactor shut down, there was a loss of offsite power. High winds caused salt accumulation on electrical equipment that led to an electrical fault and a loss of offsite power lasting about 1 minute. (NRC webpage: "salt accumulation and electrical fault" suggests **flashover**).
- **Oct 30, 1991 (Nor'easter/Hurricane - Perfect Storm)** - The operators shut down the reactor when a severe storm blew seaweed into the intake structure, clogging the circulating water pumps, and causing a loss of condenser vacuum. Weather-related loss

of offsite power lasting 120 minutes (Switchyard **flashover** reported in LER #91-024-00).

- **Dec 13, 1992 (Nor'easter/Blizzard)** - The reactor automatically scrambled on a generator load rejection caused by **flashovers** in the switchyard due to salt deposits during a severe storm.
- **Mar 13, 1993 (Nor'easter/Super-storm/Blizzard - Storm of the Century)** - The reactor automatically scrambled on a generator load rejection caused by **flashovers** in the switchyard due to wind-packed snow during blizzard conditions.
- **Dec 19, 2008 (Nor'easter/Blizzard)** - The reactor automatically scrambled when a winter storm caused icing in the main switchyard.(Switchyard **flashover** reported in 1/26/15 Supplemental Inspection Report)
- **Feb 08, 2013 (Nor'easter/Blizzard - NEMO)** - The reactor automatically scrambled at 9:17 pm when a blizzard caused offsite power to be lost. (Switchyard **flashover** reported in 1/26/15 Supplemental Inspection Report and warehouse storage screw up)
- **Jan 27, 2015 (Nor'easter/Blizzard - Juno) (Switchyard Flashover)**

Flashovers are not a trivial matter. They result in loss of offsite power needed to both operate Pilgrim's safety systems and to transmit power out. Flashovers result in automatic shutdowns, scrams. Every shutdown and startup has a risk of error or failure of equipment. Like aircraft, accidents are most likely during takeoff and landing. Second flashovers are very dangerous to workers in the yard and could cause severe burns or death. Third, flashovers can cause fires.

**Cause:** Entergy's License Event Report<sup>1</sup> following the automatic scram during winter storm Juno said, "The root cause of the event is that the design of the PNPS switchyard does not prevent flashover when impacted by certain weather conditions experienced during severe winter storms. A modification of the switchyard is planned to address the susceptibility of the PNPS switchyard to flashovers during severe winter storms." Storms should not be limited to simply those occurring in winter.

The reason that the design of the switchyard is a problem is as follows, refer to diagram:

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<sup>1</sup> LER 2-15-001-00 Licensee Event Report 2015-001-00, Loss of 345KV Power Resulting in Automatic Reactor Scram During Winter Storm Juno, April 1, 2015 (ML15097A259)

## Pilgrim's Switchyard



1. The wind during a Nor'easter blows into the switch yard at the angle shown, bringing salt spray and/or snow into the switchyard.
2. The switch yard is located such that it is surrounded by hills.
3. There is a 2- story warehouse next to the switch yard
4. Big buildings – such as the power plant – tend to draw the wind down around them.

All those factors (1-4) are reasons the wind swirls around in the switch yard. More evidence of the wind swirling around in the switch yard is the big lightening arrestors in the switch yard have fallen over in the past and landed on the bus bars in the switch yard. Those lightening arrestors historically swayed and vibrated in high wind. Years ago anti-sway attachments were made to the top of those lightening arrestors to prevent them from falling over.

During a Nor'easter workers can stand near the screen house and see the waves of salt spray heading towards the switch yard. Salt spray from a northeast direction heads right into the switch yard and the hills and the 2 story warehouse tend to make the salt spray and/or snow swirl around in the yard and thus cause the insulators to become coated with salt and/or ice in a storm.

The unfortunate location of the switchyard explains its susceptibility to flashovers. In contrast, the insulators on the electrical transmission towers up and over the Pine Hills do not get coated with snow and ice during a blizzard or Nor'easter and flashover.

## **Solutions**

**1. Shut Reactor Prior to Severe Storms, as requested in the petition:** As said in the introduction, petitioners request that NRC provides either a license amendment or guidance requiring Entergy to place the reactor in cold shutdown prior to the anticipated arrival of certain severe storms (irrespective of the season) that make timely evacuation infeasible or impossible. Obviously, any time state government institutes a travel ban or travel restrictions for Southeastern Massachusetts this should apply. In addition, should travel conditions significantly reduce speed, visibility, and road quality, this directive should be implemented. NRC should create a clear policy as to when and how this order would be issued. Implementing this policy is not suggesting that every significant storm would create a public safety issue at Pilgrim. It is acknowledging that if any public safety issue did arise during such an event, either related to weather or coincidental, neither the state nor the local community would be able to implement the evacuation and emergency response procedures it is required to have in place. This is especially important because Entergy's switchyard's proposed "fixes" do not provide reasonable assurance that the problem will be fixed.

**2. Switchyard Design Change:** Entergy's LER recognized that it was necessary to "Implement a switchyard design change to minimize switchyard flashovers during snow storms." We would not limit it to snowstorms but instead simply any severe storm. The problem will get worse. Severe storms are predicted to be more frequent and severe due to climate change.

The single design change that would solve the problem is to enclose the entire yard. It would cost money; but flashovers result in automatic scrams. Every shutdown and startup has a risk of error or failure of equipment as well as lost revenue to Entergy; along with adverse publicity and increased attention by the NRC and public. Second, scrams are dangerous and if a worker or several workers are severely burned or die, that properly will cost the company money too.

But that is not what Entergy plans to do. Entergy's plan is unlikely to make a difference in a severe storm.

NRC's 95002 Supplemental Follow-Up Inspection report 05000293/2015009 describes Entergy's proposed fixes to icing in the switchyard. The report says that Entergy plans to address the icing in the switchyard with portable heaters, pressure washing and /or manual brushing.

Regarding the heaters: The report fails to say whether Entergy is buying more heaters; and if so will there be a sufficient number and whether the plan to store them are in locations that they can be brought to the yard in a time effective manner in a severe winter storm; or, are they dragging the heater(s) around and refreezing behind it? How many heaters does the NRC feel are sufficient to avoid re-freezing? Has NRC analyzed the storage location of the heaters and time required under harsh conditions to transport the heaters to location?

Regarding Power Washing: There is no explanation how power washing avoids re-freezing. If heaters are the answer; again, how many are required? Where is the water to power wash coming from? What assurance does NRC have that the power washing equipment and personnel can get to location in a severe winter storm, like Juno?

Brushing: How can the NRC assure energized lines will not be mistakenly brushed by Entergy workers manually brushing lines in the switchyard? What assurance does NRC have that the personnel can get to location in a severe winter storm, like Juno?

### **Insulator Service Life Issue**

Although the report says that the Doble Engineering, the testing company, said that the insulator expected service life was (30) years and therefore all insulators should be tested, Entergy decided not to follow its advice and got into trouble. The Supplemental Report says that Entergy will test them all by 2016. We see this as a lack of commitment for not doing testing in the first place (money); a relaxed schedule to finally get it done; and invitation by the NRC to the industry to run equipment to failure.

The NRC and its Office of Inspector General (OIG) both chronicled this problem. David Lochbaum, Union of Concerned Scientists, blogged about it ( <http://allthingsnuclear.org/nuclear-plants-and-nuclear-excuses-this-is-getting-old/>) and outlined how the NRC and its OIG found that some owners replace components before the service lifetimes while other owners run equipment to failure. While NRC prefers the former, they don't sanction the latter. Bottom line - NRC inaction is driving more and more owners toward bad behavior. Lochbaum concludes that the NRC seems pleased to allow the practice to continue until it kills someone, and then use those deaths to “ask” the industry to change its ways.

### **C. Emergency Response During Severe Storm Conditions**

Petitioner’s June 11, 2015 petition showed that during winter storm Juno evacuation was not possible for days. For example: The Massachusetts Governor Charlie Baker had declared a state of emergency, including a travel ban, in the Commonwealth of Massachusetts due to Winter Storm Juno. In his televised announcement, The Governor said:

White-out conditions and treacherous roads will make driving anywhere extremely dangerous ...I repeat, driving will be virtually impossible in many areas for extended periods starting late tonight and through much of tomorrow.

I can't stress this part enough. Please stay off the roads. Everyone should expect impassable roads across the state.

We are also preparing for major coastal flooding along our entire coastline. High tide is conveniently coming at about 4 a.m. in most places, which will be right at the peak of the storm and the threat of coastal flooding is very real. We can see damage to coastal roads as well.

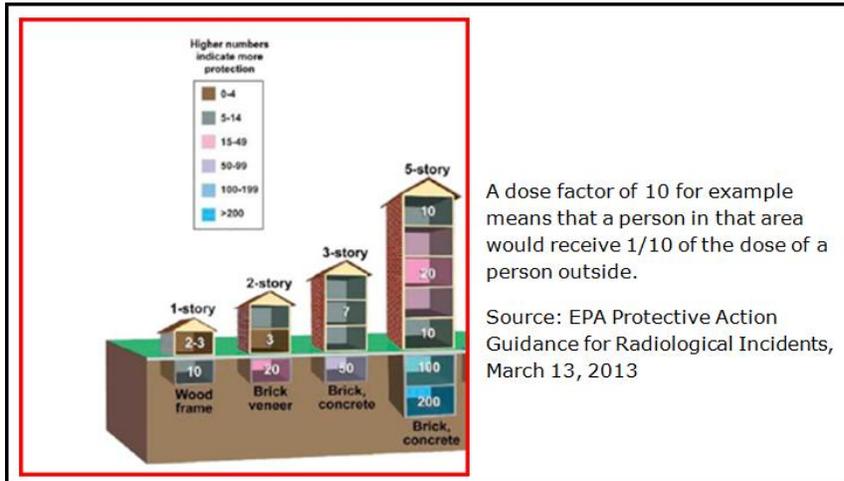
It's extremely important that everyone stay off the roads.

We have declared a state of emergency effective immediately. We will implement a state wide travel ban. (Petition, 4)

Chief Nord, EMD Duxbury, said that he:

...stated clearly that the days following the storm that Duxbury could not implement its evacuation component of the plan due to the snow amounts (and) during that particular weather event I as Duxbury’s EMD did not have reasonable assurance I could implement the plan during that snow event. (Petition, 7)

During previous severe storms, there were occasions when timely evacuation was not possible for a portion if not all of the EPZ. Sheltering has very limited effectiveness. The area's housing mainly consists of wood-frame single family houses. EPA shows that dose reduction is limited and in a short period the dose inside and outside become equivalent.



Notification of a nuclear event requiring emergency response and instructions to the public is limited during severe storms due to loss of power, that is exacerbated by the fact few people have fixed telephones. Further, the emergency sirens are unlikely to be heard, if in fact they sound, because windows will be shut during storm conditions and competing noise is generated from storm winds. A Town of Duxbury Emergency Management Department November 20, 2014 telephone survey in Duxbury followed a siren test. The day was a warm day so that some were outside, others inside without air conditioners running and perhaps open windows. It showed that the Pilgrim ETE incorrectly assumed that mobilization of the general population will commence within 15 minutes after siren notification (ETE, 2-5, 5-1). However the survey showed, despite media notices of the time and date of the test, that approximately 1/3 of the respondents did not hear the siren and only about 1/2 of those that heard the siren heard and understood the siren's voice message.

### **III. Conclusion**

Timely evacuation is unlikely during severe storms. Severe storms increase the odds of an accident with offsite releases requiring evacuation. Pilgrim's location makes it susceptible to severe storms. Climate change increases the likelihood of an increased number of severe storms. Pilgrim's switchyard is susceptible to flashover due to severe storms resulting in LOOPS and scrams. The proposed "fixes" are unlikely to solve the problem. Until there is reasonable assurance that the switchyard flashover problem has been resolved by covering the switchyard and then demonstrating success by actual experience during a couple of severe storms, the NRC should provide either a license amendment or guidance requiring Entergy to place the reactor in cold shutdown prior to the anticipated arrival of certain severe storms irrespective of the season.

Respectfully submitted on July 13, 2015,

Mary Lampert  
Pilgrim Watch, Director  
148 Washington Street  
Duxbury, MA 02332  
Tel 781-934-0389  
Email: mary.lampert@comcast.net

William Maurer  
Cape Downwinders  
140 Gifford Street  
Falmouth, MA 02540  
Tel. 508-548-6221  
Email: wmmaurer@comcast.net

Rebecca Chin  
Co-Chair Town of Duxbury Nuclear Advisory Committee  
31 Deerpath Trail, North-Duxbury, MA 02332  
Tel. 781-837-0009  
Email: rebeccajchin@hotmail.com

Diane Turco  
Cape Downwinders  
157 Long Road  
Harwich, MA 02645  
Tel 508-776-3132  
Email: tturco@comcast.net