

The Meltdown:
Three Mile Island Caused Health Effects to Citizens

By:

Madison P. Sangrey

Honors: United States History 2

Mr. Mealy

Fall 2017

Dawn was out shopping with her sister and kids when all of a sudden her day flipped upside down. "... I was shopping with my sister, my mother, nieces, nephews, and my children at a kids clothing store and it came across the radio."¹ What does she do? Is the air safe? Will they all be okay? Is the power plant under control now?

The Nuclear Regulatory Commission (NRC) claims that there were no health effects of the Three Mile Island nuclear accident. However, it has been proven that Pennsylvania has removed cases of cancer and other health problems from around this time.² The radiation in the air from this accident caused health issues to some of the people exposed to it. The Three Mile Island meltdown affected the health of people as shown by the fact that cancer rates increased, people became mentally unstable, and the state has been accused of false statistics.

Three Mile Island (TMI) is a nuclear power plant on an island in the Susquehanna River in Middletown, Pennsylvania. TMI has two units, TMI-1 and TMI-2 which both produce nuclear energy. In the plant water first gets sent from the cooling tower through the main feedwater pumps to the steam generators, then gets sent to the reactor core to cool it. From there it goes back up through the steam generator and into the turbine generator in the secondary cooling circuit and then into the cooling tower.³ The primary reactor is the nuclear portion of the plant and the secondary is the non nuclear section.

On March 28, 1979 the Three Mile Island Meltdown occurred. It started when the main feedwater pumps stopped sending water to the steam generators. This kept the heat from getting

¹ Lindeman, Dawn. Personal interview with the author. Lancaster, PA. October 15, 2017.

² Nukefree.org. "People Died at Three Mile Island." Accessed October 24, 2017.
<http://www.nukefree.org/news/peoplediedatthreemileisland>

³ World Nuclear Association. "Three Mile Island Accident." Accessed October 28, 2017.
<http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/three-mile-island-accident.aspx>

removed from the core so in the end it would overheat. When this happens the turbine generator automatically shuts down, so nothing can get through to the secondary reactor⁴. All this pressure builds up in the primary system so the pressure relief valve has to open to allow pressure to flow out of the reactor. However, problems were caused here which initially caused this meltdown. The pressure lowered back to normal levels so it was time for the valve to get closed again. The problem is that the control room showed that the valve got closed but it never actually did, so cooling water kept exiting the valve and the staff did not know. At the time there was no way of telling the amount of water in the core other than assuming that if the pressure level was fine than the water level was too. Due to the loss of water, the primary system's pressure began to drop again which would cause further issues with the reactor coolant pumps so they had to be turned off. The pressurizer, was continuously filling since the turbine generator was off preventing anything from exiting the primary system. To keep it from filling all the way the staff lowered the amount of cooling water coming in. Without the reactor coolant pumps and cooling water, the core got overheated and partly melted.⁵

Radiation was released to prevent a decrease of coolant to the core and to reduce the excessive amount of pressure in the primary system. In the evening of March 28, federal and state authorities had a new concern relating the TMI-2 incident. They were concerned that there was too much radiation released in the air to the public. According to Lindeman, on March 29 they started advising that "pregnant women and young children" that lived "within a five-mile radius" from the power plant should evacuate their homes. She also said that they later changed

⁴ The primary reactor is the nuclear portion and secondary is non nuclear portion

⁵ U.S.NRC. "Backgrounder on the Three Mile Island Accident." Accessed October 28, 2017. <https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html>

that to a ten mile radius.⁶ NRC had later come to the conclusion that there were no dangers from the release of radiation due to the amount released not exceeding the normal amount released each year.⁷

To start off, the NRC had claimed that there have been no health effects to humans or animals from the TMI nuclear meltdown. However, according to author Harvey Wasserman, “...the state of Pennsylvania hid the health impacts, including deletion of cancers from the public record...”⁸ In addition, the National Center for Biotechnology Information (NCBI) says that the studies saying that there were no health effects may be inaccurate and are now being reconsidered.⁹

The NRC says that there were not any health effects from the TMI meltdown however, cancer rates in humans increased after the accident. The estimates for all cancer rates per dose of radiation was “0.020” without socioeconomic variables¹⁰ added in, and was “0.035” with them.¹¹

⁶ Lindeman, Dawn. Personal interview with the author. Lancaster, PA. October 15, 2017.

⁷ United States Environmental Protection Agency. “Investigations of Reported Plant and Animal Health Effects in the Three Mile Island Area.” Accessed October 28, 2017.
<https://nepis.epa.gov/Exe/ZyNET.exe/91008J97.txt?ZyActionD=ZyDocument&Client=EPA&Index=1976%20Thru%201980&Docs=&Query=%28cells%29%20OR%20FNAME%3D%2291008J97.txt%22%20AND%20FNAME%3D%2291008J97.txt%22&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C76THRU80%5CTXT%5C00000011%5C91008J97.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=18>

⁸ Nukefree.org. “People Died at Three Mile Island.” Accessed October 24, 2017.

<http://www.nukefree.org/news/peoplediedatthreemileisland>

⁹ NCBI. “A reevaluation of cancer incidence near the Three Mile Island nuclear plant: the collision of evidence and assumptions.” Accessed October 28, 2017.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1469835/>

¹⁰ Where they live, wealth/afford treatment, ext

¹¹ NCBI. “A reevaluation of cancer incidence near the Three Mile Island nuclear plant: the collision of evidence and assumptions.” Accessed October 28, 2017.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1469835/>

These statistics prove that radiation causes cancer. The cancer estimate went up around the time of the TMI meltdown and there was a release of radiation into the air during the accident. It would make sense that the radiation from the accident caused this cancer increase.

In addition to that, Harvey Wasserman said that, according to his source, cancer rates from “1975-79 and 1981-85” and in a ten mile radius of TMI have “rose from 1731 to 2847” which is “A 64% increase.” This increase did not have any direct “links” to the TMI accident though. However, “the rise might be due to stress.”¹² That stress could have easily been caused by the accident. It would make sense that this is the case since the rate went up in the few years following the accident.

To continue, thyroid cancer is also something that can be caused by radiation. A person being exposed to radiation can have damage caused to their thyroid from it. A woman that was around a year old and lived half a mile from TMI when the accident happened now has thyroid cancer today. Not only her, but her “sister and mother have thyroid problems too.”¹³ All three of their thyroid problems could easily backtrack to the radiation released during the accident.

It was not just her family, samples taken from people who lived near TMI and have developed the cancer show that more cases of it relate back to radiation exposure.¹⁴ Radiation was released into the air from the meltdown and cancers from around the time of the accident

¹² Nukefree.org. “People Died at Three Mile Island.” Accessed October 24, 2017.

<http://www.nukefree.org/news/peoplediedatthreemileisland>

¹³ Health Physics Society. “Category: Nuclear Power, Devices, and Accidents - Nuclear Accidents.” Accessed November 3, 2017. <https://hps.org/publicinformation/ate/q8964.html>

¹⁴ Penn State. “Possible Correlation Shown Between TMI Nuclear Accident and Thyroid Cancers.” Accessed November 3, 2017.

<http://news.psu.edu/story/469874/2017/05/31/research/possible-correlation-shown-between-tmi-nuclear-accident-and-thyroid>

had more to do with radiation than usual. The increase in cases due to radiation was not just a random occurrence, it was because of the radiation from the accident.

Finally, not only could people have become physically unhealthy but emotionally unhealthy too. People that worked in the control room the time of the accident could have become mentally unstable afterwards. They could have put so much pressure on themselves for messing up and allowing the accident to happen. The knowing that they could have been the reason for someone's cancer, or sickness, or anything, could ruin his or her emotional well being. Lindeman's friend, Annie's husband was working in the control room when the accident happened. All the "stress and the pressure" and the "guilt because they did release some radioactive air" caused them to get divorced. "...he just couldn't handle that pressure and knowing that he was part of releasing that air."¹⁵

Authorities did not start to advise people to evacuate until the day after the accident occurred.¹⁶ Not recommending this until the day later could have caused health problems that would not of even have happened if they told everyone earlier. Therefore, not only is the NCR incorrect about the Three Mile Island meltdown causing health problems, but they could have prevented some of them from even happening.

The Three Mile Island disaster was not safe for the citizens around. People becoming diagnosed with cancer was increasing, those involved became mentally unstable, and the state falsely advertised health statistics. Pennsylvania has the highest thyroid cancer rates, could this be because of the accident? The people working there felt so guilty about the accident that their everyday lives got affected. Everyone says that there were no health effects from the meltdown,

¹⁵ Lindeman, Dawn. Personal interview with the author. Lancaster, PA. November 3, 2017.

¹⁶ Lindeman, Dawn. Personal interview with the author. Lancaster, PA. November 3, 2017.

but do they know that the state hid the health problems from it. The nuclear industry was never trusted the same way again after this accident. The Three Mile Island nuclear meltdown has gone down in history.

BIBLIOGRAPHY

Interview

Lindeman, Dawn. Personal interview with the author. Lancaster, PA. November 3, 2017.

Websites

Health Physics Society. "Category: Nuclear Power, Devices, and Accidents - Nuclear Accidents." Accessed November 3, 2017. <https://hps.org/publicinformation/ate/q8964.html>

NCBI. "A reevaluation of cancer incidence near the Three Mile Island nuclear plant: the collision of evidence and assumptions." Accessed October 28, 2017. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1469835/>

Nukefree.org. "People Died at Three Mile Island." Accessed October 24, 2017. <http://www.nukefree.org/news/peoplediedatthreemileisland>

Penn State. "Possible Correlation Shown Between TMI Nuclear Accident and Thyroid Cancers." Accessed November 3, 2017. <http://news.psu.edu/story/469874/2017/05/31/research/possible-correlation-shown-between-tmi-nuclear-accident-and-thyroid>

United States Environmental Protection Agency. "Investigations of Reported Plant and Animal Health Effects in the Three Mile Island Area." Accessed October 28, 2017. <https://nepis.epa.gov/Exe/ZyNET.exe/91008J97.txt?ZyActionD=ZyDocument&Client=EPA&Index=1976%20Thru%201980&Docs=&Query=%28cells%29%20OR%20FNAME%3D%2291008J97.txt%22%20AND%20FNAME%3D%2291008J97.txt%22&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C76THRU80%5CTXT%5C00000011%5C91008J97.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=18>

U.S.NRC. "Backgrounder on the Three Mile Island Accident." Accessed October 28, 2017. <https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html>

World Nuclear Association. "Three Mile Island Accident." Accessed October 28, 2017. <http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/three-mile-island-accident.aspx>