An Oral History of Three Mile Island and its Clean Up

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Interviewee: Dennis Kelly
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Statement of Purpose

The purpose of the American Century Oral History Project is to better our understanding of a transnational history and to learn about a certain event more in depth. As historians it is our job to remain objective and selective towards information and converge primary and secondary evidence into our interpretations. This project helps us to learn, not only the event itself, but all those events, people, and countries that were affiliated with it. To interview people and collect and preserve their personal stories adds primary sources on the certain event so that later historians have more content to learn from. Out of this project emerges a new primary source. We add to history by giving the personal narrative of what a certain person went through during that event. It gives a different perspective other than what textbooks say. In this Oral History Project I have conducted, Dennis Kelly frames the Three Mile Island meltdown and its clean up. His personal accounts on the topic now give us this knew information that can further our knowledge on the event.

Biography

On April 9th, 1956, Dennis Kelly came into this world in Boston, Massachusetts as the oldest of 10 children. He spent most of his time growing up in Brockton, Massachusetts around Cape Cod claiming his Lebanese faith. When he went to college in Worcester, Massachusetts, at Worcester Polytechnic Institute, he began to become more Irish because "we could drink when we were 18 when I was growing up." After getting a four-year degree in Mechanical Engineering he moved to Pittsburgh for three years where he began designing tools for a nuclear reactor. He met his wife, Caroline, in 1977, as a senior in college while he was working on a project with the government. While Caroline was in Washington, Dennis was in Pittsburgh and they dated long distance. Finally, Bechtel decided to have Dennis work down in Washington D.C. They got married in March 1st, 1980 and they had their first child, Erin, in 1982. 15 months later their second child Sean was born. Dennis then transferred from nine years of engineering to spending the next 28 years to the insurance/finance industry. Dennis currently lives in Rockville, MD and likes to spend his time working with Veterans and helping people with career transitions.

Before and After the Disaster of Three Mile Island

"Fermi and his group had successfully transformed scientific theory into technological reality. The world had entered the nuclear age" (U.S. Department of Energy 7). Nuclear power emerged in 1942 with the first self-sustaining chain reaction created by Enrico Fermi and Niels Bohr. As years progressed, a hunger for nuclear power made its way through the world. Scientists researched and developed many purposes that it could be used for, starting with the idea to develop effective weaponry that could be used in 1939 to 1945 during World War II. A transition from fossil fuels to clean nuclear power was also one of these developments. The construction of nuclear power plants came next, beginning in 1954 in Philadelphia. This nuclear power plant was called Three Mile Island and it had two cores; the second one had the malfunction. In 1979, Three Mile Island became a model for new safety requirements for all plants within the nation. Across the world it became a lesson learned, making an impact on the way all nuclear power plants were then controlled and looked after. To understand the cleanup of Three Mile Island one must examine nuclear power/energy, the accident and aftermath of Three Mile Island, as well as gain a first-hand perspective from someone who was there.

Nuclear energy all began with uranium-235, also known as U-235. This isotope is one of the few that fissions[1] easily, and then becomes unstable from absorbing loose neutrons. Fission products[2] are produced from this and are much lighter than U-235, "The combined mass of fission products is less than that of the original whole atom because energy and neutrons are released" (U.S. Department of Energy ii). In order to have a successful nuclear power plant, a lot of heat is needed to generate electricity. These vast amounts of heat can be procured from having a self-sustaining chain reaction, which is caused from grouping together uranium and letting it

[1] When isotopes split and part of their energy is released as heat.
[2] Light atoms that result from fission.

continually fission. When the isotopes go through the process of fission, they give off energy as heat, but they also cause chain reactions: “Two or three neutrons are released along with the heat. These neutrons may hit other atoms, causing more fission” (U.S. Department of Energy ii). Like a steam-electric power plant, a nuclear power plant takes this heat to boil water, and then lets the steam power everything. The only difference is the material used to heat the water. Nuclear power plants use uranium-235, but a steam-electric power plant burns fossil fuels, such as oil, coal, or gas. Many people turn to the use of nuclear power plants because, while they are burning U-235, they do not give off the same pollution as fossil fuels. In the end, the foundation to a good nuclear plant is the ability to fission U-235.

In order to have progressed to nuclear energy a couple of things needed to have been discovered first. Many scientists helped lead to a grand discovery of fission in the 1930’s. Enrico Fermi, being one of these physicists, forced neutrons onto uranium in 1934. He discovered the outcome was an element considerably lighter than that of the original uranium. Four years later, another pair of scientists, Otto Hahn and Fritz Strassman, had done just the same. They took neutrons from radium and beryllium and shot them at uranium. From this they discovered a lighter element from what was leftover, “They were surprised to find lighter elements, such as barium, the leftover materials” (U.S. Department of Energy 4). Lise Meitner, cousin to Frisch, put together that these elements were lighter than uranium because the uranium was splitting. But upon testing the theory, it was proved incorrect because the atomic masses did not equal that of uranium’s. With further thought, Meitner discovered with Einstein’s theory that whatever did not add up to the mass of uranium was lost as energy. This further explained how the process of fission came about.

A self-sustaining chain reaction came next in the creation of nuclear energy. In 1939, Bohr and Fermi met at a theoretical physics conference in Washington D.C. Here, they decided to see if they could get a substantial amount of energy from splitting atoms. This was also known as a self-sustaining chain reaction, and many scientists began to think about it too, "Scientists throughout the world began to believe a self-sustaining chain reaction might be possible" (U.S. Department of Energy 5). The main concept of it being possible is if they could get a critical mass[3] of uranium together and under a certain condition. In 1941, Fermi and Leo Szilard created a design for the chain reactor, "Their model consisted of uranium placed in a stack of graphite to make a cube-like frame of fissionable material" (U.S. Department of Energy 6). Chicago Pile-1[4] was the product of Fermi and other scientists' brain storming at the University of Chicago. By the end of 1942, they were ready to start building the reactor, "The pile was erected on the floor of a squash court beneath the University of Chicago's athletic stadium" (U.S. Department of Energy 6). Not only was uranium and graphite in the pile, but the scientists also discovered that cadmium[5] rods had a great effect on the chain reaction. The closer they were to the pile, the slower the reaction was, and in contrast, the farther they were, the faster the reaction. This occurred because the cadmium rods absorbed those neutrons that were supposed to split the uranium atoms. Fermi and his team had begun the demonstration by slowly pulling the rods away from the pile. After hours had passed on December 2, 1942, they had finally reached a self-sustaining nuclear reaction. This was the key discovery that brought the world into the nuclear age: "Fermi and his group had successfully transformed scientific theory into technological reality" (U.S. Department of Energy 7).

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[3] The amount of uranium needed to cause a self-sustaining chain reaction.
[4] The world's first nuclear reactor.
[5] A metallic element that absorbs neutrons.

From this, the United States advances to the Manhattan Project, where they developed weapons for World War II. President Roosevelt asked Senator McKellar to hide this $2 billion project hoping it would win the war for America, in 1942. The Senator passed the job down to the soon-to-be U.S. army general Leslie Groves. He purchased 52,000 acres of land at Oakridge[6], and hired J. Robert Oppenheimer, a physicist, to be the scientific director. Because of a lack of information given to the public, rumors began to spread around the creation of the Manhattan Project, "The military mind so resents the necessity of telling civilians anything that Major-General L. R. Groves, the Officer of Engineers at the head of the project, has give out only as much information as he deems necessary to counteract the rumors about his organization" (Johnson 1). Despite these ill feelings toward the project, it was said in an issue of Science and Technology that it continued to evoke with the main purpose of beating Germany, "The purpose of the Manhattan Project was to find a way to split the atom and build a bomb before Germany could" (Alexander 1). Scientists experimented with many different techniques, but at last discovered two different types of weapons. Both of these were used in the Japanese bombings with a gun-type uranium-235 device for Hiroshima on August 6th, 1945 and an implosion-type plutonium-239 device in Nagasaki on August 9th, 1945. The Manhattan Project led to a transition from the Nuclear Age to the Atomic Age, "Ultimately, the vast project carried the United States and the world into the Atomic Age and through monumental change" (Brown 1).

After World War II, the Manhattan Project was no longer used to create weapons as said in a 2009 article reflecting on past events, "When World War II concluded, the Atomic Energy Act of 1946[7] turned the entire project over to the U.S. Atomic Energy Commission, reflecting

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[6] One of three secret cities used to hide military labs.

[7] Established Atomic Energy Commission to use atomic energy for peaceful purposes and to the extent of defense, security, and the health and safety of the public.

both traditional American military deference to civil authority and a desire to divert this newly harnessed power to peaceful purposes" (Brown 1).

In 1946 the Atomic Energy Commission was solely created to make nuclear energy calmer for the people of America. The use of nuclear energy for commercial energy use was the first goal in the mid-1950's. By December 18th, 1957 Shippingport, Pennsylvania was the proud owner of the first electricity-generating plant. It was time for the plant to be fully operational because the rods need to be slowly drawn away in order for the chain to stabilize, " Scientists estimate it will take three to four weeks to bring the Shippingport reactor up to full power the first time. This long period is necessary because extensive tests must be made at each power level" ("First Full-Scale Atomic Power Plant in U.S. Nears Operations Stage" 5). Soon after this development, private industries wanted to take part in having nuclear plants. The 1960's brought a huge expansion in the use of nuclear energy because it was seen as cleaner and safer. But a decade later there was a steep decline because concerns grew over the affects nuclear waste had on the environment. Even with the decline, the United States was the leading country in nuclear energy, "the U.S. had twice as many operating nuclear power plants as any other country in 1991. This was more than one-fourth of the world's operating plants" (U.S. Department of Energy 9). By the end of that year, lots of other countries had joined team nuclear energy, "31 other countries had nuclear power plants in commercial operation or under construction" (U.S. Department of Energy 10). Although the use of nuclear energy had risen and died, in the end it was used more commercially than defensively.

Many issues soon arose in the United States concerning the nuclear power and energy by the 1990's. These goals were, "To maintain exacting safety and design standards; to reduce economic risk; to reduce regulatory risk; and to establish an effective high-level nuclear waste

disposal program" (U.S. Department of Energy 10). To accomplish these goals the U.S. Department of Energy worked to make new power plants safer and more efficient. Not only that but scientists discovered that when atoms fusion[8] they give off energy with less amounts of radioactive waste. But not enough energy is given off, "However, scientists are still unable to produce useful amounts of power from fusion and are continuing their research" (U.S. Department of Energy 11). These goals to improve nuclear power plants may have come from the United States worst nuclear disaster in 1979.

Three Mile Island is a nuclear power plant that has two cores and the second one is the core that the accident took place. In the beginning Three Mile Island was the product of a proposal for an "Atoms For Peace" plan by President Dwight D. Eisenhower on December 8th, 1953. He wanted to start building nuclear power plants for commercial use, "plans for the peaceful uses of atomic energy was the building of a nuclear power plant for the commercial generation of electricity" ("Shippingport Atomic Power Station" 2). After the United National General Assembly accepted the proposal, Dusquesne Light Company became the public-service foundation for the project and was given 5 million dollars to make it happen. Rear Admiral H. G. Rickover[9] was given the responsibility to watch over the production and make sure it had a successful outcome. They chose a small village to begin building the plant, "The land was located in the small village of Shippingport, Pennsylvania on the Ohio River about 25 miles from Pittsburgh" ("Shippingport Atomic Power Station" 2).

On September 6, 1954 1,400 people came to the ground-breaking ceremony where the President would begin the construction, "activating a large highlift which moved forward and scooped the first dirt in the ground breaking ceremony" ("Shippingport Atomic Power Station"

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[8] The process in which atoms are joined to produce energy.
[9] Director of the AEC Division of Naval Reactors

4). The plant was said to be able to produce electricity for 100,000 people, which would help bring up the "Golden Age of Electricity". This particular plant was said to be much different from those that were to follow, "The Shippingport project was directed towards advancing the basic technology of light water cooled reactors, through design, development, building and testing and operation of a large power reactor as part of a public utility system" ("Shippingport Atomic Power Station" 6). Although this power plant was supposed to be a milestone for mankind, many people were afraid of atomic energy. The Dusquesne Light Company took it upon itself to go forward to the media and explain to them that "all safety precautions possible were taken in order to minimize the possibility of the escape of any radiation from the plant" ("Shippingport Atomic Power Station" 7). This helped reassure the public that everything was taken care of.

By October 1957, the 58-ton reactor was ready for fuel loading "containing 14 tons of natural uranium and 165 pounds of highly enriched uranium was installed" ("Shippingport Atomic Power Station" 9). 45 days later on December 2nd, 1957 at 4:30am the plant was ready for operation, "the control rods were raised just to the point of criticality, where the atomic reaction would maintain itself" ("Shippingport Atomic Power Station" 9). And by the 18th of December at 12:30am the plant had produced its first energy and coincided with the Dusquesne Light Company. The outcome of the plant was much better than what people had originally believed, "It was found that the reactor and station as a whole equaled or bettered the expectations of its designers and operators and they noted that it operated with an ease and responsiveness surpassing conventional coal-fired stations" ("Shippingport Atomic Power Station" 9). Between 1957 and 1964 the plant had produced about 2 billion kilowatt-hours of electricity, but it was time to install the second core.

In 1964, Three Mile Island had been shut down in order to have a second core built in. To be built, companies needed to gain approval from the AEC, "Jersey Central Power & Light Co. and Metropolitan Edison Co. received clearance from an Atomic Energy Commission licensing board for construction" ("General Public Utilities Receive Approval to Build Nuclear Plant" 1). Metropolitan Edison Co. was in control of operating and maintaining the plant, so it had full responsibility of what was to come. The second core alone was going to cost 236 million dollars, but it would increase the plants ability to produce energy a lot, "The new core increased the plant's electrical generating capacity from 60,000 to 100,000 kilowatts" ("Shippingport Atomic Power Station" 2). Completed and fully operational on February 3rd, 1965 the plant had produced more than 3.5 billion kilowatt hours of electricity by February 4th, 1974. 5 years later in 1979, the worst nuclear accident would be happening right outside many people's homes.

At 4am on March 28, 1979, the core of Three Mile Island was melting down. Technology was at fault. There was a mechanical failure that led to a series of unfortunate events,

> But during routine maintenance, an automatic valve in the Unit 2 reactor closed unexpectedly, most likely due to mechanical or electrical failure. This isolated the reactor core from the water supply needed to cool it and prevented the steam generators from removing heat. The plant's automated systems shut down the reactor core, which should have contained the accident, but it did not. (Smith 1)

No one realized that part of the reactor core was exposed. Because of that, radioactive gases had escaped into the containment center, as well as outdoors. During the fourth hour, 8 am, the Nuclear Regulatory Commission was notified and at 9:15 am the White House was called. All nonessential workers were told to go home, and by evening time the core was cooled. Two days later, March 30th, it was said that Governor Thornburgh had "advised all pregnant women and

small children today to stay at least 5 miles away from the crippled Three Mile Island nuclear power plant" (Lyons 1). More radioactive particles would be released and he did not want them to get hurt, "radioactivity continued to leak and another burst of contaminated steam had to be released for safety reasons" (Lyons 1). This caused the public to become very unhappy because they did not want their lives getting risked because the plant needed to relieve pressure on the main system. Soon after the disaster occurred, follow-ups were made with the different organizations related to Three Mile Island.

When the NRC heard the news, they sent former deputy director of the NRC, Harold Denton, from D.C. to Three Mile Island. Once there he talked to President Carter and was told three instructions:

> One was that he would make all of the resources of the federal government available to bring it to a safe conclusion. The second instruction was always tell the truth. And, third, was to keep him fully informed at all times of anything going on. He wanted to be called at a 7:45 every morning and at 3:45 every afternoon and any time anything significant happened. ("THREE MILE ISLAND: TWO HOURS AND 20 MINUTES TO WRECK A CORE" 1)

Afterwards, the NRC had made two mistakes. First they had received a reading of 1200 millirem per hour around the plant. By federal law when there was a reading of 5 millirem, people were supposed to be evacuated immediately. When they called the state to tell them that there needed to be an evacuation, the state responded saying, "We've got people on the ground here, and there's no radiation levels like that at all anywhere" (qtd. in "THREE MILE ISLAND: TWO HOURS AND 20 MINUTES TO WRECK A CORE" 1). Denton and the crew had no idea where that measurement had come from. But then it hit them that they had taken the measurement right

over a stack of vents that had waste gas coming from them. The second mistake was a miscommunication over the hydrogen bubble. Denton had told the governor and the White House that it would be safe, but the NRC headquarters in Bethesda, MD had said otherwise. The next day Bethesda called down for an evacuation, just as the president was on his way to visit. As President Carter and the first lady landed on site, Denton had to explain the miscommunication and give both sides of the stories to reassure President Carter that everything was safe. When people heard that President Carter was visiting Three Mile Island, feelings about safety shifted, "When his helicopter touched ground, people knew it was safe", (qtd. in "NRC Official Recalls Government Response to Three Mile Island Crisis" 1). People became much more calm after this, "His visit defused the psychology of the situation" (qtd. in "NRC Official Recalls Government Response to Three Mile Island Crisis" 1).

Outside of the plant, Bill Dornsythe, former state nuclear engineer and representative of Governor Thornburgh, was having his own crisis. To inform the public as to what was going on, a press conference was held. It was Bill's job to get the facts of what was going on at the plant and inform the Governor. When Bill called the plant, he was told that everything was under control and there had been no releases. So the Governor went up thinking that was the latest information, but Bill made the mistake of calling the plant. This time he was told that there had been some releases, and there was not enough time to warn the Governor. Because of this, he had to contradict Governor Thornburgh when he was brought forward to the press to answer questions. Within the next couple of days things began to get back under control.

Former senior technical advisor to General Public Utilities, William Lowe, stated, "the problem was stabilization, not recovery"(qtd. in "THREE MILE ISLAND: TWO HOURS AND 20 MINUTES TO WRECK A CORE" 1). He and Tom Crimmins volunteered themselves to go

down to the control room and get a first hand account to what was going on. While there they saw that the there was a spike in the containment temperature, and before they knew it, a hydrogen bubble was in the primary system. If the bubble fell into containment and burst, then thousands of people would be threatened. Needing to measure its volume, they called down Jim Moore from GPU (General Public Utilities). Together they decided to use Boyles Law[10] and determined the bubble was 1,568 cubic feet at 875psi (pounds per square inch). On April 1st the crisis was over because it was believed that the bubble would not be able to burn or explode because of a lack of oxygen.

The overall disaster does not live up to its nickname, "The China Syndrome." Right before the accident at Three Mile Island, a movie called The China Syndrome was released. It was about a nuclear power plant that had a serious core melt down and had burned straight through the core of the earth. On March 29th, an article was released that disapproved this as to what happened in Three Mile Island, "This is not a 'China Syndrome' type situation" (qtd. by Janson 2). Although there was a partial core meltdown, it was not so bad that it kept on burning to the other side of the world.

Even though the plant had radioactivity within the walls, it was not harmful, so by 1993 the clean up of Three Mile Island was finished. It was a 14-year long process. Two years of which an evaporator was used to rid 2.23 million gallons of water from Three Mile Island. Sometimes the evaporator would give off radioactive steam from the water, "The steam, released at various times by the electric evaporator, carried tritium, a radioactive form of hydrogen" ("14-Year Cleanup at Three Mile Island Concludes" 1). Beginning in August 1979, the waste was shipped to Richland WA, "the first shipments of accident-generated low-level radiological waste"

[10] If the temperature remains unchanged within a closed system, then the absolute pressure and volume of a given mass are inversely proportional

("The TMI-2 Cleanup: Challenging and Successful" 1). 1,000 skilled workers planned to help participate in cleaning up the mess. They had to wipe down each level of the plant until it was all decontaminated, starting top to bottom. To show that an area was clean they would seal it off with plastic so that no contamination could get back in. There was still damaged fuel underwater and this was the most difficult task to cleaning Three Mile Island. It took 6 years for people to finally figure out what to do, so in 1985 people stood on a platform on the reactor and pulled out the fuel into canisters. "In all, 342 fuel canisters were shipped safely for long-term storage at the Idaho National Laboratory" ("The TMI-2 Cleanup: Challenging and Successful" 1). 1990 was the first major completion to the clean up process, "workers finished shipping 150 tons of radioactive wreckage from the damaged reactor vessel to Idaho for storage at the Department of Energy's National Engineering Laboratory" ("14-Year Cleanup at Three Mile Island Concludes" 1). By the final year, approximately $1 billion had been used, and thankfully not a soul was harmed from the accident.

The idea of radioactivity having affected the people around Three Mile Island is constantly being debated. An epidemiologist, Steven Wing, went to reexamine the area and found out there were higher levels of radiation than was reported,

> But after reexamining the region's cancer statistics and measured radiation levels, epidemiologist Steven Wing and his colleagues at the University of North Carolina, Chapel Hill, concluded that more radiation may have escaped than was measured and that the risk of some cancers did rise. ("ScienceNOW" 1).

Other scientists rebutted this by saying that if there were higher levels of radiation then why were there no cases of childhood leukemia and thyroid cancer. All it takes is a point of view to determine whether or not the area actually was dangerous.

Alysha Howar interviewed a woman named Holly Dender who was living near Three Mile Island. Her perspective of the evacuation was fairly simple, explaining, “We basically left” (qtd. in Howar 20). There was a sincere sense of fear in the air about what they were breathing, “People were worried that there was stuff in the air that we would all get cancer or you know, down the road and how it was going to affect us later” (qtd. in Howar 21). She also explicated that she believed the NRC was not just covering up, but giving as much of the facts as they could as to not scare the people. Holly began to speak about how the farms were eerie looking because the farmers had taken in all of the animals. Overall, from a bystander’s point of view, there was more fear for health than anything else. No one wanted to have radiation poisoning.

Since Three Mile Island, the United States has not created anymore nuclear power plants. But what has occurred from the accident is a new sense of safety. It was a wake up call that showed there needed to be many changes to the way nuclear power plants were being built and managed. From the accident many nuclear plants have been rebuilt and future ones will never be built the same. As for now, the United States is in a nuclear freeze, meaning that there has not been any nuclear growth for some time,

> Designed to stop the drift toward nuclear war through a U.S.-Soviet agreement to stop the testing, production, and deployment of nuclear weapons, the freeze campaign escalated into a mass movement that swept across the United States. (Wittner 1)

But there are a few possibilities that a nuclear renaissance could happen. Some believe that with higher gas prices, and bad pollution, fossil fuels are not going to be lasting long, “Increasing energy demand, plus concerns over climate change and dependence on overseas supplies of fossil fuels are coinciding to make the case for increasing use of nuclear power”(“World Nuclear Association” 1). Nuclear energy will rise again, but this time with better precautions.

Over the years, Three Mile Island has been brought up in many debates. It has been discussed in whether or not the radiation leakage affected people. There has also been talk about how it helped prepare the world for new nuclear power plants. Historians have shown that it was a learned lesson to all mechanical engineers and companies that work with nuclear power plants. It helped safer plants with better designs. For the future there will be less of a chance for failure in the computers and humans. Simpler buildings will be made so that there is no need to misread data. Overall, it may have been a disaster at the time, but there were fewer problems with other power plants because of it.

Three Mile Island is an important event in the United States because it happens to be one of the worst nuclear disasters to ever happen in the country. Without this event the world would be less experienced in nuclear energy. From this rude awakening, everyone now knows the seriousness of nuclear energy and how there should always be improvement in safety/design regulation and waste disposal mechanisms. Three Mile Island brought preparations to plants across the world, and without them more serious problems may have occurred.

Interview Transcription

Interviewee/Narrator: Dennis Kelly
Interviewer: Ella Farago
Location: Mr. Kelly's office, Derwood, MD
Date: December 29th, 2012

Ella Farago: This is Ella Farago and I am interviewing Dennis Kelly on the topic of Three Mile Island and its cleanup as part of the American Century Oral History project. The interview took place on Saturday, December 29, 2012 at 2:20pm located in Mr. Kelly's office. This interview is recorded using an IPhone 5 and a MacBook Pro. So, you were born in 1956 in Boston, Massachusetts, right?

Dennis Kelly: Yes.

EF: Where did you spend most of your time growing up?

DK: In Brockton, Massachusetts around Cape Cod.

EF: What was your childhood like?

DK: I guess normal. Well, not really normal, because I'm the oldest of ten children

EF: Oh wow

DK: So we had a big family and we had a lot of relatives, kinda did everything as a family.

EF: Did you like having a big family?

DK: I think so. (laughs)

EF: (laughs)

DK: I didn't know any different.

EF: (laughs) That's fun. Where else have you lived since then?

DK: I went to college in Worcestor, Massachusetts and then after college I went to Pittsburg for three years. And then we moved down here to Washington, you know, to the Rockville area, and I've been around Rockville for 30 years.

EF: Do you recall any major events while you were growing up?

DK: Yep, I remember when President Kennedy was killed [1963], I think I was in the second grade. I remember them bringing the TV's in and having us watch the funeral. And then Martin Luther King got killed [1968], you know, a couple years later. And that Robert Kennedy [1968]. So I remember those parts of the sixties, you know, since I was in school.

EF: Did that affect you any way, growing up?

DK: I don't think so, I mean I think it's just apart of the accumulative life experiences that you have.

EF: Did being Lebanese and Irish affect you while growing up in anyway?

DK: I guess I'll always remember growing up claiming my Lebanese faith cause like we were closer to my mothers parents, and I spent a lot of time with those, you know, with my aunts and uncles there. They lived in the same town as us, but it seems like later on I became more Irish. (laughs)

EF: (laughs)

DK: You know, with the drinking

EF: (laughs)

DK: carrying on as a high school and college student. (laughs) We could drink when we were 18 when I was growing up. (laughs)

EF: You went to, what college, western what?

DK: Worcestor Polytechnic Institute

EF: How did you decide your schooling?

DK: Well my SAT scores were really high in the math and really low in English so I decided to be an engineer. (laughs)

EF: (laughs)

DK: And that's how I picked an engineering school. I thought I was gonna be an architect at first, and then I went into civil engineering for the first two years. But then I had a consular that convinced me that I'd have a better chance getting a job if I went into mechanical engineering. And that's how I ended up with mechanical engineering.

EF: So what have you done involving engineering?

DK: Well right out of college I designed, I was designing tools that took apart another nuclear reactor that was outside of Pittsburgh. It was a experimental reactor, I think it was the first nuclear reactor in the country actually. And so we were designing special equipment's that would go in; you have to do that stuff under water because of the radioactivity and do everything remotely. So that was my first couple years out of college. And then in '79, the Three Mile Island accident happened and the project got delayed because of the accident. It wasn't really directly related, but they decided to slow down our project and I went to work for a small company working with coal and coal conveyor belts and things like that for a year. Got married, Caroline moved to Pittsburgh for a year. We were dating long distance between Washington; Caroline grew up here. Between Washington and Pittsburgh and then the end of the year I got invited to come to work for Bechtel to work on the Three Mile Island project, so that's how I ended up back here in Washington.

EF: Was a long distance relationship hard?

DK: It took care of my weekends (laughs)

EF: (laughs)

DK: So we'd work during the week and then I'd either come to Washington or she'd come to Pittsburgh and we did that for a couple years. And we actually met when I was in college here. I did a project with the government my senior in college [1977]; that's how we met.

EF: Did you transition into insurance slash financial business or did you, were you taking it the same time as mechanical engineering? [5:40]

DK: No, actually, it was after I was already an engineer and I was working on Three Mile Island project. Our second child, Sean, was born with a hearing impairment and so as I was learning about, I was doing a lot of traveling with Three Mile Island. We were building equipment in Pittsburgh and Lynchburg, Virginia and they would take it when the plant was up in Middleburg, so I was constantly travelin around. And when my son was born we realized we had to do some different things and so I think it was really that which had me change careers and so I could free my schedule up. I thought it was just gonna be temporary. I thought I was just gonna do it for a few months or a year and then I'd go back to engineering. Seems like I never went back to mechanical engineering, but I've spent the last twenty-five years doing financial engineering. (laughs)

EF: (laughs) Would you prefer having gone back in mechanical engineering?

DK: Yeah that's a good question. Sometimes I think if I would've stayed in the science field's things might've been different, but I don't know how much. Today I'm at the forefront of the health, you know, healthcare. You know, what they called a crisis or the transformation of the healthcare systems. So I do still feel like I'm making a pretty big impact on the world or the country. I like to talk about health insurances being my second national crisis. (laughs) But for the most part I do believe that I've always been able to just use the things I've learned in

engineering to just apply it to problem solving so, you know, big problems and little problems. (laughs)

EF: How did you get into veteran work?

DK: I seemed to just be attracted to helping veterans out. Different things I get involved with. And then recently I was remembering that my grandmothers' house, she had lived in a very big house in Brockton, 26 bedrooms, and she was actually providing room and board for veterans the whole time I was growing up. So I think that, you know, carrying that I saw my grandmother giving those men some how plays into it but I haven't figured the whole thing out. But I am involved in a mentoring program for guys that are coming out of the service and trying to get back into jobs and I've always had a, you know, I've always liked to try to help people network and figure out where their careers are going and stuff like that. Sounds like part of my planning background I guess.

EF: What made your grandmother decide to house veterans?

DK: I have no idea. (laughs)

EF: (laughs)

DK: I think she was entrepreneurial and I think, you know, they had a big house. I don't know which came first, the house or the veterans. (laughs)

EF: (laughs)

DK: They were there when I was there. They were there before I was born so they were there my whole life. Never had the chance to really ask her. (laughs)

EF: (laughs) How-

DK: It's only been recently that I related the two items too. I've always had this willingness to help and support the veterans but never really knew why and then one day I was thinking about that.

EF: How did you get into people career transitions, its just that following with veteran work?

DK: I think it's just something that came naturally. You know, working with people at church and just people in transitions and sometimes they need, you need a third person to or a second person to just help you see other things. I feel like been givin a little bit of a gift or a talent at networking so I'm always interested in what other people are doing and so if I see someone that wants to do something and someone that's trying to do something, I naturally just try to put em together.

EF: When did you get married? [10:22]

DK: In 1980, March 1st of 1980.

EF: And you have two kids?

DK: Mhmm

EF: And their names?

DK: I have a daughter Erin, she's our oldest. She's 30 this, she was 30 this week or last week. (laughs) The 21st. And then I have a son, Sean, who was 15 months younger. He was actually born on my birthday so we share the same birthday.

EF: That's pretty cool.

DK: So I lost my birthday 29 years ago. (laughs)

EF: (laughs) What have they decided to do, like does it correlate to what you do?

DK: I dunno. Erin, she started into college as a nursing major, and then she switched to math. She taught math at Holy Child for a couple years, and Saint Elizabeth's. And then now she's

running a dance studio and she was always a dancer. She danced growing up, and danced on the dance team at college. She went to the University of South Carolina. So that was a big experience for her and now she's actually managing the dance studio where she grew up and danced all her life.

EF: That's pretty cool.

DK: You know, I think she follows, following her heart. Sean is just working different jobs. He's got a bachelors in just business. He's married. They've been married three years, and they live up in Minnesota now, which is pretty cold.

EF: So, when did you first hear about the creation of Three Mile Island?

DK: I always knew about nuclear energy going through college. When I thought about machine design and mechanical engineering, I really didn't think about nuclear, but then when I was graduating and looking for jobs the opportunity to work on a nuclear reactor that they were taking apart. Seemed like a good career move in terms of the nuclear industry at that time in the late '70s was definitely growing. People had a lot of promise in terms of what it would be like and the uses of it. So at that point I thought I was getting into a career that would be a much longer career, and different career. (laughs) So, as far as Three Mile Island, I probably never even heard of the island until

EF: (laughs)

DK: until the accident happened in 1979. And I think it was kinda coincidence that it was so close, you know, here in the east coast.

EF: Can you tell about when you heard about the construction and operations of Three Mile Island?

DK: Three Mile Island had two reactors; they had TMI-1 and TMI-2. I think Three Mile Island 1 was about 5 years older than 2, and it was already up and running. Three Mile Island 2, I think, only ran for about a year, if I remember correctly, or a year and a half or something like that, before the accident happened, so it was a brand new reactor that when the accident happened. I didn't get involved in construction. I knew a lot, I mean I was exposed to a lot of construction cause of Bechtel so we were one little group at Bechtel that was worrying about taking apart Three Mile Island, but the whole rest of the company was involved in building reactors all around the world so I was exposed to the construction site of other reactors but not of Three Mile Island.

EF: What did you think about the use of nuclear energy versus fossil fuels?

DK: I've always been an advocate for nuclear energy. It's very efficient. It's very productive. The nuclear waste, even though it is toxic and you have to manage it in a special way. There's less of it then there is of other, you know, ashes and smog and the other pollutants that come from coal and oil. So I think even today I'm in favor of it. I think the government does regulate it quite a bit so even, but even with the excess regulation it's still more efficient, more economical than other powers sources. I'm encouraged that we may start building new reactors and start using it again. Cause I think we've learned a lot about it and the rest of the world is still using it without many incidents.

EF: Do you think that if they started to build them again in the U.S. would you get involved in that? [15:54]

DK: Well the one detriment or the one negative or the hardest part of it of getting back into nuclear energy is that a lot of the people that worked it have all retired or are retiring and so

there's a gap in knowledge there. So some of that has to come back. It'd probably come from younger generations; they probably wouldn't wanna retrain me (laughs)

EF: (laughs)

DK: to do those things. But there's still expertise around the country and with the Internet. That expertise is more accessible. So, I don't think that, you know, right now I'm very actively involved in the healthcare and health insurance, and I see where that's going in terms of my career path, or my life cycle. I have more than enough to do for the rest of my life in that, you know, part of the world or that part of, that industry. So I don't see that I would go back to the nuclear industry right as a benefit to me or society.

EF: With healthcare, are you like pro Obama or against Obama? Where do you stand?

DK: The "Obama Care" act is a very complex act. I am very much for people understanding and having health care and, you know, making it affordable and accessible but I think my position on the Obama care act, it's more about revenue and, you know the government has made some promises for Medicare and the cost of Medicare is getting outta hand. And Obama care is kind of a back handed way of getting young people to pay for the promises of old people without really tellin them that they're doin that. So those are the things that I'm really, you know, I guess I'm disturbed about. There's pieces of Obama care that have nothing to do with health care; it's all about just big government and getting more revenue and more resources for government to do things and I don't believe government is the most efficient or effective way to do things, especially something that is big and as broad as health care. You know we have the best health care in the United States around the world because the people have been free to innovate and create and solve problems and make money or not make money. And I don't know that institutionalizing the health care system will make it better. So generally I would say I'm against

the patient act of 2010 and I think it'll evolve and it's like a pendulum and it will swing back, things like this go in cycles and so it'll cycle back. The hard part for me to understand today is when we passed the bill in 2010, it was supposed to lower the cost of health care, or lower the cost of health insurance and now every story you read is why the cost is goin up (laughs) and why the bill is gonna cost more money and add more costs and add more complexity. And so there was a deception that in the agenda of the whole bill that, and there's a little suspicious part of me that said there's some people that knew that's what they were doing. Well we'll just sell em this now and then we'll sell em this later, and the costs are definitely going up because of the regulations and some of the rules that were passed and those rules aren't necessarily helping more people get health care.

EF: So where and when did you first hear something had happened at Three Mile Island? [20:21]

DK: I was working at the Bettis Atomic power lab. We were supporting the whole nuclear navy, so all the nuclear submarines and the aircraft carriers. That was our responsibilities, it was about 25 hundred engineers on site there in, outside of Pittsburgh. And because the accident was right there in Pennsylvania, we probably knew within hours what was going on, and partly because we were the technical support of the navy and so people at Bettis probably got called in very quickly. I mean I didn't, I was just a junior engineer (laughs) at the time. But we were aware that it had happened and it was in the news immediately.

EF: What went through your mind as you heard it?

DK: Well probably immediately I worried about, I was thinking about my career choice. (laughs)

EF: (laughs)

DK: I'd only been a year and a half, two years outta school and there were here now this big accidents happened and (laughs) I'm like "oh great now what do I do". (laughs) So I think that oughta do. Remember that, having that conversation with myself and even, and then the first major impact was, like say we were all ready to take this other nuclear reactor apart in October and this was probab-, I think the accident happened in July or June, I can't remember the exact day, but, so they decided not to shut our reactor down, and I don't know if it's a conscious decision because of the man power and the money that it would take but to the to divert it to somethin else, or they just wanted to wait and see what was gonna happen with it, you know, with the whole industry and stuff. But, I remember bein very frustrated, "well what do you want me to do, we're ready to take this thing apart now", (laughs) "y- you want me to just wait". And they said "well yeah just, it'll be two years", and like two years that was like a whole career for me. So that's why I went into the job with the other company and the conveyor, you know coal conveyor systems so even then there was a little bit of me that was kinda hedging my bet, and say "well if nuclears not gonna workout maybe coal, we'll always be burning coal". (laughs) So in effect I had both coal and nuclear experience which made me very attractive to Bechtel when it came time to actually call Bechtel and at that time I wasn't tryin to get into a career, I was just tryna move to the Washington, D.C. area. (laughs) And next thing you know, I was on the Three Mile Island project. I don't know if that answers your question. (laughs)

EF: I think so. So, people around you, what did they think about what was happening, like not people working in your line

DK: Mhmm

EF: Of duty but like, in your community?

DK: Yeah, so I was only 20 something years old. 22, 23, 24, you know those years so. You don't tend to have a lot of friends out side of work cause they relocated you, like I grew up in Massachusetts and I went to Pittsburgh to work, so when I went to Pittsburgh the only people I knew were the people I worked with really. As we moved to Washington and I started working in Three Mile Island, probably that's when I would get questions from friends and others that would say, "what's goin on out there?" and, "what how did it happen?" A lotta curiosity around how it happened and as I understood the actual sequence of what happened, it was, you know, I realized it was part human error and part mechanical error. Anyway, I don't know what, I can't really remember what other questions I would get or conversations we would have around it. I'm sure if I was older I would've been more aware of the societal discussions. In society we still had protests going on at different power plants that were still under construction and people were still tryna block the construction at new plants at that time in the late '80s, or in the '80s. There was a lot of protests around this building, when we was, a lot of people didn't want nuclear power at that time. And then after the accident it was much easier for them to stop building plants and just do things slightly different. There was a big shift in the industry after the accident. But I do remember having conversations many times about the fact that there really wasn't any radiation leakage. That's how, what they described as leakage or potential leakage was minute pieces and it was a very safe environment, even accessing in and out of the containment area was a very controlled process, so that you were always controlling the radioactivity and the particles that would have a tendency to get out and be damaging to people.

EF: Well, was there a sense of fear, like just people around you were they like, were they really scared and like trying to get out of the area? [26:13]

DK: I remember the stories of that; I probably had a couple of stories from people that actually lived in the area. But by the time I was going there to work, it'd already been a few years after, and so things had really settled down pretty quickly. There was fear I think initially just like with, in 2001 when we had 9/11. Everybody was afraid of terrorists and afraid of what was gonna be next, so there was that kind of fear in the air. Right around the time of the accident was this something that could happen to any reactor or is, do we really understand what happened, why it happened? As time went on we realized it was just a simple valve failure, and someone didn't pay attention to the to the gauges, and in fact the gauge was saying one thing, they says oh the gauge is wrong. (laughs) And the biggest mistake that was made was when the instrumentation was telling people what the problem was, they didn't believe it and so they tried to do, they did something else. They thought they were protecting the reactor, but they were really, they were defeating the reactors own protection systems. So, that was the human error that was made in terms of overriding the systems that were designed to protect against that stuff.

EF: Did you know anyone who was living around the plant?

DK: I met people later because a lot of the same guys that worked the reactor during construction were working at, for the cleanup so we did get to meet some of the working, you know, the guys that worked on site and some of the laborers and crafts men that were working on the site, they tended to live in that area. They were already working on it for construction, and even after a plant is built there's a lotta construction work or cleanup work, preparing the site, doin the various maintenance projects, there's a lotta valves and wires and there's a tremendous amount of equipment in a nuclear power plant. It's always in constant repair and maintenance, so there's a lotta people that work at the plant.

EF: They say it was like a five day disaster kind of

DK: Mhmm

EF: And it happened in 1979, when did you go in to work for it?

DK: When did I go in to work?

EF: Yeah.

DK: I remember all the days that was what was sorta rolling out because you hear engineers and people talking, even at my place about what was going on and getting feed back and you'd see a group of guys that were leaving to go to the site and takin-, they were taking, borrowing equipment from us, like the dosimeters and some of the equipment that's used for measuring radiation. We had a lot of that stuff at our plant in Pittsburgh, so I do remember groups of guys that were going, again I was just a young engineer and so at that time I didn't have any specialized experience in a running plant. (laughs) But when it came time to take it apart, it turns out I had a lotta experience in taking one apart because our little group was the only group takin apart in other reactors, so that experience was very specialized and just happened to put me at the right place at the right time in terms of design and, but that was years later or it was probably a year and a quarter later, a year later.

EF: When you had heard it was human-computer malfunction, what was your reaction? [29:54]

DK: I guess as an engineer you just kinda accept. You know, okay this is what happened, here's how to stop it in the future, here's how to make it better. So in engineering you learn how to fix things and then when the fixes don't work, you figure out why it didn't fix and then ya fix it better the next time. In engineering, it's constant improvement, cycles. So unlike, ya know, like in politics and health insurance right now, it seems much more political and emotional and a lot of back door things and people doing things behind the scenes and stuff like that. It doesn't seem to be that way in engineering when you're working with mechanical things and electrical things.

They just turn on and off. (laughs) So if you turn it on and it doesn't work, well you just fix it. (laughs)

EF: (laughs)

DK: So, I don't remember having any emotional or anger or anything like that about the accidents. It's like, okay well we had an accident, lets fix it and lets get back at it.

EF: How did you feel about the presence of a hydrogen bubble in the primary system?

DK: So my exposure to that woulda been from two different perspectives. One when I was in Pittsburgh, I was getting the same information the public was getting; that there's a hydrogen bubble. So we were just kind of watching it, maybe we had a little bit more, our group sitting around talking about it probably talked about it differently than a group sitting around at a gas station. Then later on after I was working on the accident, working to take the thing apart and understanding what happened and how it happened, where hydrogen bubbles come from basically. I understood it and you just basically protect against it. I can't say that when I was directly involved I wasn't as involved enough to know "what do you do about this now?" I wasn't with the group that was actually doing that in '79.

EF: What was your reaction towards Governor Thornburgh telling all the pregnant women and children within 5 miles to evacuate?

DK: I don't remember that order. I mean remember it, again, in hindsight but I don't remember that day when they were actually doing it. I do remember, actually now that you've mentioned that, I remember us criticizing some of the fear because there really wasn't this big radiation leakage, the building wasn't gonna blow up. (laughs) We sorta knew certain things engineering wise that were safety and that were in place, and so I probably do remember the people around me at the engineering facility thinking he was, this was over, he was over doing it. I did vote for

President Carter cause he was an engineer and a nuclear engineer and not necessarily cause he was a democrat or a republican, or whatever. But, I do remember when he went to Three Mile Island to visit that it was, in hindsight, it was a good move because if the President can go and walk around the control room and beyond sight then it's gotta be safe, right? No ones gonna let the President go there if it's not safe. So, I do remember that being a good thing for the country and I remember feeling like, alright go get it, go tell em it's safe. (laughs)

EF: (laughs)

DK: Cause doesn't the world know this is safe. (laughs) It was just a mistake. The other thing you learn in the nuclear industry, they have multiple safety factors, so if this fails then this is the backup. If that fails this is the back up. If that fails that's the backup. So in the way we designed nuclear reactors in the United States, you have these multiple systems that would have to fail before anybody would be, before the public would be hurt. We knew all of that, so sometimes we hear things in the news that we just, we criticize and say, " No no no no, stop don't worry about that." (laughs)

EF: So how did you feel about more radioactive particles having been released in the ecosystem to relieve pressure from the primary system?

DK: It was such a small amount that I really, I wasn't worried. I remember the public overreacting to it. I remember one trip that I went from Pittsburgh to Harrisburg when we were building the equipment. You have this thing called a dosimeter that you wear on your, on your uniform when you're onsite and walking around places and it keeps track of how much radiation that you've come in contact with, especially when you're in the containment where there's radiation all around you. You can only be in for certain times to keep things at a safe level. Well I remember leaving my dosimeter on my dashboard of my car and driving from Harrisburg to

Pittsburgh with it in the sunlight, and I actually, it read more radiation on that drive home. (laughs)

EF: (laughs)

DK: I got back to the office and they were like where were you? (laughs)

EF: (laughs)

DK: I was like, "oh my god I left it out in the sun." (laughs)

EF: (laughs)

DK: The sun has radiation too. (laugh) So they do monitor things that are very, very small levels. And so it's extremely protective environment.

EF: When President Carter and his wife visited the plant, they had their own doce-, what is it called?

DK: Dosimeter.

EF: Yeah and it was like giving higher readings than what everyone else was having. What did you think about that? Did you feel like that they should have check on that before cause then it, didn't they have to like reassure them that everything was okay?

DK: (laughs) Yeah I don't remember that part. (laughs)

EF: (laughs)

DK: I missed that one. But I do know that everybody on site had a dosimeter and you were constantly, you'd mark down the readings at various times during the day so that you could know if you got exposed to something or you went close to something or if there was somethin someplace that they didn't know about. The radiation particles were in the water that was inside containment. And there was also water that was being contained outside containment, so you never knew if a valve had leaked and that was clean water or dirty water. So there were

situations where, you know, very minor situations but the worst situation were you could have contaminated water outside of the containment. For the most part they found all that stuff and cleaned it up very quickly and contained it. So the other thing I don't think the public understands very well is there's alpha radiation and gamma radiation. Gamma are the big particles that they use for X-rays and things like that, that kinda go through your skin. Alpha radiation is actually more damaging cause it's not strong enough to go through your skin, so if you have alpha radiation on your skin you just wash it off and it goes on the towel and the towels go into a special container. The hard part with alpha radiation is if you ingest it, if it gets in your body, it's strong enough to do damage to the tissue inside your body. Your lung tissues very sensitive, and blood vessels and things like that are more sensitive. So when alpha radiation gets inside your lungs, it's just like imagine a ping pong ball. It's just bouncing around and tearing up something. Imagine a ping pong ball in your home that just keeps bouncing around and knocking things over and breaking vases and stuff like that. That's what alpha radiation does in your lungs cause it can't get out so it just keeps bouncing around and it does, so it damages that tissue. That's why people wear respirators and masks and things like that so you don't ingest the alpha radiation. And there's more alpha radiation, generally, than there is gamma radiation. Gamma comes from actual particles, where alpha can be in the air and dust particles can have alpha radiation come off it. So all these contamination services, all these washing services, are keeping them real clean so that there's no chance for alpha radiation to lay behind and then be ingested or be drinking something or food or breathing.

EF: Do you think that going in at the time of the disaster, do you think the radiation risk was pretty high or do you think it was alright? [39:58]

DK: So there was a much higher risk to the people that went in initially. I mean the radioactive steam had gone throughout the whole building, so the inside the containment building imagine dirty water everywhere. And so the groups of guys and men that went in right after the accident when they finally opened it up and started going in to clean the thing. I think there were three levels within the containment, and the bottom level, it took many years before they actually went down with robots first to clean up because that's where all the water had drained down and it was just basically sitting down there. But they had thick concrete floors between them. The top level got cleaned out pretty easily, guys went in with steam cleaners and just kinda cleaned everything, wiped all the surfaces down and then they cleaned the second level. And I remember them cleaning the different parts, and then they put plastic up and so you knew it was clean. And then eventually they sealed off the lower level until we finished taking the reactor apart. And then eventually they went in, I think even cleaned out the lower level. And now it's just kind of sealed off for everybody, I mean it's just sealed. So I never went in. So that was probably the most risky, when the guys would go in cause the radiations everywhere; people cleaning it up and all kinds of services, it wasn't intended to be. So I never went in on those trips. But the guys that did go in were very well protected with their suits and everything and the trash and stuff was very well protected and cleaned up and taken out through multiple stages of protection. I didn't have a desire to go in or I never really had the opportunity to go in during those work tasks, but I remember when I was up there with my equipment and we had put the camera down inside I really did wanna go in (laughs) and put the camera down and be involved in the actual handlin of the stuff and so I think when we put the camera in 19, was it 82 I guess, there was six or eight trips in to do the video hanging and take the pieces apart and stuff and I got to go in on at least one of those trips and I was pretty excited about it. For the most part I was in the control room.

We had a little control room where the video feed was coming back too and we were in radio communication with the guys that were doing the work, and we had video cameras to watch them moving the stuff in and procedures they were following, and stuff like that. But when I went in it was already clean, it was still contaminated but it was clean enough to go in do your stuff and then get out. I was probably in for half an hour, an hour that day.

EF: How much time did you spend working on the plant?

DK: The first project I worked on was a project to figure out a way to get a camera down inside the reactor, so we took out a control rod and slipped the camera down the hole and that gave us a picture of what was on the inside of the vessel. So that was in the '82. It probably took a year or so to plan. They were already planning that before I got to Bechtel but I got there and we changed the tools around a lot and changed the plans around quite a bit. So it took a year to plan; I was probably on site for a month or two and the actual work was done within a two or three week period, if I remember correctly. From the first group, they said there was about 6 groups, 6 trips in and out of the containment to do that camera piece and so that was the first time on site. But that was the first big project I was involved on site, and then the second one was when we designed the big piece equipment, that was designed to go sit on top of the reactor. There it was more of a process; it took probably two or three years to design that, and test it and we first designed it and built it out in Pittsburgh, so I was out in Pittsburgh a lot observing the different tests and watching the schedule and all that stuff. And then I was involved when they moved the stuff to TMI to Harrisburg, Middletown whatever. And then I was involved when we started testin the stuff on site, and then for that one they pretty much turned it over to the construction people so I never went into the containment when they were actually using that equipment; I had

moved on to another project once they delivered the equipment on site, then I went into sort of the construction people that actually used the tools and did the actual work.

EF: Do you remember when Bill Dornsythe had to contradict what Governor Thornburgh had said about the plant during the press conference? [46:04]

DK: No.

EF: No, he had called the plant and asked if there was any radiation, and so he told the Governor that there wasn't any radiation leakage and stuff and then right before the Governor went on to the press conference and talked about it, he had called again but then they told him that there was leakage

DK: Right.

EF: Only a little bit, but he never had time to tell the Governor. So the Governor had said one thing, and then for all the questions Bill had to go out

DK: Right.

EF: And he had to contradict it.

DK: Yeah know that you're saying that, I remember something like that happening. It was almost like a little steam burst or like a little drip of water came out of some corner or some building or something like that. So it was never a leakage, but it was kinda like in court, well did you have a leakage or didn't have a leakage. (laughs)

EF: (laughs)

DK: It was splitting hairs on the details as far as how much it was and stuff. And it was extremely low-level radiation, it was water that had been used in cleanup, so it wasn't water that was in the reactor or that was in direct connection with fuel or anything like that. It's the other piece that I remember in the conversations.

EF: So you feel like the government is really making a big deal out of nothing, or not the government but people involved in it?

DK: Mhmm. Yeah I mean I think that happens. Now that I'm older I can see that in other, like we talked a little about Obama Care, what you hear on the newspaper, or what you read in the newspaper is not always the reality that's going on with the people that are actually doing it. So if I'm afraid of something and I'm writing about what I'm afraid of I'm gonna have a different perspective than someone that's not afraid of it. (laughs) You can't help but hearing that in my writing, right? (laughs) Cause I'm tryna prove that you should be afraid too. (laughs) If I'm afraid and you're not, there's something wrong with you, right? (laughs)

EF: (laughs)

DK: Cause I'm supposed to be afraid and you're supposed to be afraid too. So I think anytime you have a national crisis, you're gonna have people on both sides and that's where it's kinda like the true truth. What is the true truth? So you can't get the true truth until you talk to someone who really knows, that you can trust. (laughs) There are people in the world today that you can trust to tell you the news even if it's bad news, and then there are other people that just wanna tell you what they wanna hear. And so where insecurity comes from the fact when you think someone's telling you something just cause you wanna hear it versus they're hiding something alright, if they're tryna to cover up something you get a sense that, hey you're trying to cover something up, what're you coverin up? So I think it doesn't matter if it's the government or a business or BP during the oil thing. I know some people that were involved in the BP crisis and I think there is some evidence that they were doing some things they weren't supposed to be doing. They said they were drilling 5,000 feet, and there may be evidence that they were actually down 10,000 feet. (laughs) And everybody knows you're not supposed to drill 10,000 feet. (laughs)

EF: (laughs)

DK: We don't know what'll happen if you drill 10,000 feet so if you drill 10,00 feet some things are gonna happen that you don't understand. I think the same things here. You over ruled the safety systems, now you've messed the reactor up and so now the reactor doesn't operate the way it's supposed to and now we have contaminated water in places we don't normally have it, but it's still in a 2nd and a 3rd and a 4th degree of safety. It's not like someone went in the reactor took the water with the fuel cells and just took it outside into the river. (laughs)

EF: (laughs)

DK: Three Mile Island nuclear reactor had a double loop system, meaning that the water that was in contact with the reactor is different water than the water that's in steam, that produces electricity. That's another aspect of well what was the contamination, where did it come from, like I said before there's gamma there's alpha and then there's a lotta gamma and a lotta alpha or there's little gamma and little alpha. (laughs) And if you're measuring all radiation and all contaminating particles, then it's kinda like yet is there it. It's not like is there an acceptable level, it's is there any. So if you get into is there any then it's just yes no and what do you mean yes. (laughs) As soon as you say yes everybody's like oh my god we have radiation leakage. (laughs) But it was an acceptable amount of radiation, no no no you said we had radiation leakage. (laughs)

EF: (laughs)

DK: It doesn't matter that it's acceptable, how do you know it's acceptable? (laughs)

EF: (laughs)

DK: In those days they really would debate radiation, like any was unacceptable. There were people that debated you just couldn't be around it, period, and the other side of the argument was, well don't go outside! (laughs)

EF: (laughs)

DK: Cause you're gonna get radiation from the sun. (laughs)

EF: So, what do you remember about the China Syndrome? [52:10]

DK: I know it's a theological series of events that this is potentially happens if this happens and this happens and this happens and this happens. It's the theory of how a nuclear reactor can start eating itself up and expanding, and it's highly theoretical. In the reality, it would be extremely difficult to happen because the more the core would get molten, the more non-fissionable products would mix in with that, the less fission you'd have. So in a nuclear reaction, the positioning of all the fuel cells and the distance between the rods; it's very precisely designed. (laughs) To generate heat, and if things get out of whack, it doesn't generate heat anymore. So the idea that when all these materials would get together in a blob, that they would be enough maintaining those perfect dimensions to keep generating heat. It's a hypothetical description of a chain of events but the practicality of it happening, it's almost like if you think of that TV commercial that's one of the car companies has where the guys at the top of the hill and he makes a snowball and the snowballs going down the hill and it's getting bigger and bigger and bigger. And in the one commercial the snowball perfectly goes back and picks up this car

EF: (laughs)

DK: and takes it out of the parking space, and then he parks in the spot. And in the other commercial he goes off the bridge and hits the tree and it makes a nice beautiful snowy scene. Well imagine that being the China Syndrome, well is it gonna be a snowy scene or are you gonna

just make a parking space. Well neither one is predictable and it's not very feasible. (laughs) The idea that I can make a snowball and fall it down the road and control it that way. The ball would never get that far because it would either get too big to roll anymore or it would be too lopsided in terms of it, it wouldn't grow perfectly round like that. When you're rolling a snowball you have to keep moving it in different directions in order to get a snowman, and I don't know if you've ever made a snowman in the snow,

EF: (nods) yeah

DK: But if you just roll it one-way you get a cylinder. (laughs)

EF: (laughs)

DK: And so it takes human intervention to make it round. The same thing would be true with a China Syndrome; the more things it melts and brings into the blob, the less things that has that can produce heat. So if it's burning through concrete and steel and water and there's a thing called boron, I think it was the poison that they actually, there's a chemical that is outside the reactor and so when there's an accident they inject this chemical into the processor and it actually absorbs neutrons, so it shuts down the heat generating process. So you got that boron in there and you got the uranium and so the idea that it can all just keep making heat is highly unlikely. Not a very scientific description,

EF: (laughs)

DK: But that's the way I remember it. (laughs)

EF: That's okay.

DK: If I was a physicist what's that show, the big bang theory.

EF: Yeah

DK: If I was that physicist explaining to you, it would sound different. (laughs)

EF: (laughs) With your explanation, it's more easy to understand. So, its good. What was your reaction toward the NRC's involvement in the crisis? [56:23]

DK: I had a lot of involvement with the NRC because Bechtel was the head contractor, and that's who I was working for so it did seem like there was a healthy back and forth. There were people from the NRC, there were people from the nuclear navy, so it did, I do remember having a healthy amount of technical supervision from the various parts of the government and the private sector.

EF: Did you feel like they were trying to cover up what was happening?

DK: I never got the feeling that there was a cover up, just from where I was. I can't say I feel the same way about health care today. (laughs)

EF: (laughs)

DK: I think there are some cover-ups goin on in political agendas, but I never had that feeling when I was working on Three Mile Island.

EF: Did people around you feel like they were covering it up?

DK: I don't think so. I was surrounded by engineers and the engineers just let me do my job. (laughs)

EF: (laughs)

DK: If anything on the cover up part, there was a lot of money, so there was a lot of costs to do all this stuff and so if anything they probably had to be concerned where the money was coming from, who was the paying the money, there were insurance companies paying money, there were contractors that were some what liable for the accident and so I don't think about it very much today where all the money came from but it came from some place to do all that work and get it all cleaned up. It's similar to where did all of the money come from to clean up the world trade

centers and build the new building that's going up there and stuff. I mean it's a tremendous amount of money when you have a mistake or something, an accident that big.

EF: Did you feel like President Carter had covered things up?

DK: No, like I said I always liked President Carter. In hindsight as I got older and understood sorta the political stuff, I realized he wasn't a very good President, but he was a good engineer and he's a good man. There's no question he and his wife are extremely good people, what they've done since their presidency with Habitat for Humanity and his own personal wealth and the way he's used it. He's a great man, so I don't think he would have been involved in any kind of cover up.

EF: Did you know Jane Rickover or her father Admiral Hyman G. Rickover?

DK: Is Jane the daughter or something?

EF: Yeah.

DK: Yeah I didn't know her at all. I never met Rickover personally, but I knew a lot of people that knew him cause he was, I mean he created the Bettis Atomic Power Lab. Those were all his people, so there were many, many stories about him visiting and the things that he did, and so you knew him. I felt like I knew him as a man (laughs) even though I never met him. I knew a lot of people that knew him, and people that worked for him directly.

EF: So Jane, the daughter of him, she had said that:

> "In May, 1983, my father-in-law, Admiral Hyman G. Rickover, told me that at the time of the Three Mile Island nuclear reactor accident, a full report was commissioned by President Jimmy Carter. He [my father-in-law] said that the report, if published in its entirety, would have destroyed the civilian nuclear power industry because the accident at Three Mile Island was infinitely more dangerous than was ever made public. He told me

> that he had used his enormous personal influence with President Carter to persuade him to publish the report only in a highly "diluted" form. The President himself had originally wished the full report to be made public. In November, 1985, my father-in-law told me that he had come to deeply regret his action in persuading President Carter to suppress the most alarming aspects of that report."

What do you think about that? [1:01:14]

DK: That's interesting. So what was the last part, that he regretted having him release the report, or he didn't think it should be diluted down?

EF: "He had come to deeply regret his action in persuading President Carter to suppress the most alarming aspects of that report."

DK: Mhmm. Yeah so I've never heard of that before, but as I think through it I can see him thinking that the public doesn't understand this detail and would never. So they would hear things like human error, men overriding safety switches, and these big machine really can be controlled by a couple guys in a control tower, and so I think those might have been I think about the things he would have been concerned for the public not understanding, I can see why he may have wanted it suppressed. It's just a lotta data, it's a lotta intricacies that without the knowledge of what the parts mean and stuff like that it would be hard for public to understand. There's a school of thought that says, it's not fair for me to give you information that you don't understand that's only gonna make you scared, that'll put fear in you. You only give somebody as much as they can handle. In hindsight, I can imagine that he would have felt that if they would've just released the whole report, let everybody struggle with it and come to understand it, the nuclear industry might've been better, but because they suppressed part of the report it was all about the part they suppressed. (laughs) So what're hiding from me kind of thing, so I think I would

probably explain his regret, in hindsight, about thinking that he was thinking the public couldn't handle it and maybe the public coulda handled it and the industry would've been better off. We might not have shut down. By '85 the industry was shut down, so and I'm sure he woulda regretted that cause he believed in the power, nuclear power his whole life and he dedicated his whole life to that energy system and perfecting it and refining it and making it more predictable and more safe and he had sailors all around the world sleeping next to these things. (laughs)

EF: (laughs)

DK: Cause when you're in a submarine you're nuclear reactors right there in the tube with you. (laughs) So it's not like yeah I'm gonna sit on an island someplace or out in the woods someplace. And so he came to really understand and respect nuclear power, so by '85 I could see where he mighta regretted, he might've thought that well the public couldn't understand it and by '85 he came to understand well they mighta understood it and they might not have shut the industry down. (laughs) Cause understanding it, well you understood all the safety factors and stuff like that, that people were really safe. So he was probably embarrassed by the mistakes that the human error part of it and he was embarrassed for the industry and he was tryna protect that part of it, maybe. But it would be a fascinating conversation to have with his daughter-in-law. (laughs)

EF: (laughs)

DK: Maybe you and I could have that conversation one day. (laughs)

EF: (laughs)

DK: Does she live around here?

EF: I don't know.

DK: Sounds like it's his daughter-in-law.

EF: So, overall were there any rumors that were going around about the accident? [1:05:25]

DK: I don't know. There was a time period where they weren't certain exactly what happened when and in those periods there was probably some finger pointing but eventually they sequenced it all together and put the pieces together and knew what happened when, and then they actually did go to that class of nuclear reactor cause there were other plants around the country that was similar to Three Mile Island. And there were all series of fixes that they made in the other reactors so that mainly they couldn't be overridden the way they did. So and I don't think of that as a rumor but I think of it as some of the tension and the finger pointing that was going on in that period before they really understood what happened and why it happened. They also came to understand it by having similar conditions happen at these other plants, so we'd see this thing happen there and it would correct itself and then they'd see it over in this one and it would correct itself, and occasionally it wouldn't correct itself without some help, and so that's when they finally figured oh that's what happened over here and they put all the pieces together.

EF: When and where were you when you heard the accident was over?

DK: Pittsburgh. (laughs)

EF: (laughs)

DK: At work

[Interview interrupted by Mrs. Kelly checking in]

DK: Yeah Pittsburgh, working at western house. Pittsburgh. The Bettis Atomic Power Lab.

EF: (laughs)

DK: Designing my tools to take apart (laughs) my light water breeder reactor. (laughs)

EF: After you had heard everything was okay, did you actually believe it was?

DK: Yep. I took the job. (laughs)

EF: (laughs)

DK: I didn't have to take the job to go back into the nuclear industry. (laughs)

EF: (laughs)

DK: I coulda stayed in the coal industry.

EF: (laughs) What part did you play in the accident, was it just going in to clean up?

DK: Yeah, it was just designing the tools to take it apart. Designing the tools initially to inspect it, get the camera down inside and then designing the. I think I played a key role in that when I first came there they were gonna take it apart a different way, and I was only 2 years out of college and I'm just like this is not gonna work. (laughs) You can't do it this way, and we had this big huge, that one of the book is from the task force that we, they commissioned a task force and I was apart of that, that actually went through and said hey this is the best way to take it apart, and its the safest way. I mean I was instrumental in that part of the process because of my experience in, with Bettis and Rickover. I did feel like I played a key role. I was kind of amazed when I was lookin at, when I pulled the books out and I was looking at them before I gave it to realize how young I was. (laughs)

EF: (laughs)

DK: I have a 28 and a 29 year old, or a 29 and a 30 year old child and I'm thinking, I was doing this when I was 26. (laughs) And I think about my 26 year old kids saying what were you doing at 26? (laughs)

EF: (laughs)

DK: There's some humbling part of this whole thing that, even you coming to ask about it, it's a neat project you're doing.

EF: Thanks. Was it difficult, I mean, to have to create your own, like the own tools from scratch? [1:10:28]

DK: I don't think so. I mean I've always felt like I wanted to be a problem solver, and so I was always just tinkering. It's like okay we gotta get this from this here to here, how do we do it? And so you just draw pictures and then you make a diagram, and so it was fun. It's the way you do it, so there was nothing scary about it. I took the job at westing house initially because they were designing tools, like say to take apart that other reactor, and they did have a couple of design problems where they couldn't figure out how they were gonna do this, and how they were gonna do that. And during my interview I had some ideas about how they could do it, and so that's what attracted me to that job and sure enough when I came to work there then I got to work on that problem. So that was fun, and then that lead me to Three Mile Island, just by coincidence, but there's not a lotta coincidences in life when you look backwards and you say well this prepared me for this and this prepared me for that.

EF: When you first walked into Three Mile Island, what went through your head?

DK: This is really small. (laughs)

EF: (laughs)

DK: When you see pictures of reactors and drawings, they seem so much bigger than they are in real life. So at Three Mile Island, you come down to the gate and there's a big long road that drives into it and then you, the island's really just a lil small patch of dirt in the middle of the Susquehanna River. (laughs) So the two buildings are pretty small. The cooling towers are huge, and everybody sees, you see pictures of cooling towers and there enormous kinds of things, but even when you're upfront and personal with them they don't look that big. They just look like a big concrete tower and you realize it's just a wind draft that it's creating to move air through. But

the building itself is really small. The control room is pretty small, it's no bigger than this room here. (laughs) But when you see it in TV and stuff like that, everything seems so much bigger.

EF: There were reports that debated the radiation-affecting people, where do you stand on that?

DK: I stand pretty firmly on the fact that there wasn't enough leakage; there wasn't enough radiation in the leakage. It was very well controlled, and the facility itself is so isolated, when you see it out in the middle of the river. There just wouldn't have been enough to affect anybody. There were probably some people during the 5 days accident that some steam or some water came out and they were trying to control it, they were probably in a higher risk than other people, but I don't think the public was, I mean they were doing there job and there may have been some high exposures in doing their jobs that way, but they weren't unhealthy and I don't think there was enough to get out to the public, so I don't think there was any impact on the public.

EF: Some have said that Three Mile Island was an eye opener for nuclear plants in America by making people more aware of safety precautions and the need for simpler designs and better building and management. How do you feel about that?

DK: Yeah, I mean I think it's like any big industrial plant, if there's a design flaw or a design, something that's a little imperfect, and once you figure it out you can go back and correct it. And I think they did that, so as I said with the Babcock and Wilcox plants this one pressure relief valve that would get stuck open, they put springs, or they made some adjustment to the design so it wouldn't get stuck open anymore, but they didn't really know that that was a design flaw until it happened at Three Mile Island and it happened at a couple other places. At least when it happened at the other places, they were aware of the Three Mile Island, at that point they knew, don't override that switch. (laughs) It could just be a valve stuck open or something like that, you knew to look for that.

[Interview interrupted by Mrs. Kelly saying hello]

EF: Do you feel like having the accident happen it really helped make other plants safer and improved them? [1:16:01]

DK: I mean in hindsight, having the accident shut the industry down. (laughs) So I think the plants today are definitely safer; I think procedures are much more predictable. I think they run the plants at a very safe band; they don't try to really push them to their capacities and things like that, but that's all conjecture on my part. I've been in the industry long enough to know, but I just, I mean that's my sense of it, knowing the people that are involved. In those kindsa accidents, they're very embarrassing so you definitely tend to over compensate or over react on the safety side, you don't generally over react on the stupid side. (laughs)

EF: (laughs)

DK: Generally when you get embarrassed like that, you don't get stupider (laughs)

EF: (laughs)

DK: You get smarter. (laughs) So I think the industry and the plants that are operating today are operating much better, and they've been operating for a long time, within parameters. Now the knew ones that are getting built today, there'll be new features and I'm gonna guess state of the, solid state electronics now and digital and instruments are so much more sensitive and so I think the new generation of plants will be even more safe and efficient and things like that. So I think the instruments and the controls around the plant are a lot more predictable today then they were back then. If you want a good example of that, you can go down to the Smithsonian and look at the Gemini space capsule. (laughs)

EF: (laughs)

DK: If you look inside the space cabin you'll see all these switches and you think about your iPhone has two little buttons and it controls everything. (laughs)

EF: (laughs)

DK: Two little buttons control everything, and the box and in that space capsule, everything was a switch. (laughs) Toggle switches (flipping switches noise) You had to flip 15 switches, the board itself, just to have the switches. (laughs)

EF: (laughs)

DK: It's what takes up all the space and now they can do that with. My MP3 player's this big and it holds a thousand songs and I can figure out which one I wanna play and stuff, so we can control things and we can manage things at a much smaller level today. In a power plant pressure readings are very sensitive, but you can test the pressure in 16 different places now, whereas before it was a big deal to have one pressure gauge here. Today they can pressure, they can put a sensor on the piper to tell what the pressure was inside, that's how sensitive things are. That's one of the reasons that I say it'll be much safer going forward, than it is, than it was in the early days.

EF: Is there anything that you wanted to talk about that we didn't get to?

DK: No, you did a really good job.

EF: Thanks. (laughs)

DK: (laughs) What's you're career gonna be? What do you wanna do?

EF: I don't know. I think nuclear energy is cool, but what I wanna do is more like helping people who, more like helping people with psychology, but not, it's only minoring in that.

DK: Mhmm.

EF: But like, more of going into floristry cause I like flowers. So then I'd have a floristry business and then helping people be happier by working with flowers on the side

DK: Mhmm.

EF: but then my dad is a financier with homes and stuff so I could also do that

DK: Mhmm.

EF: to make him happy, but he wants me to be a lawyer.

DK: (laughs)

EF: So I'm all over the place. In regards to these books, was there anything that you might want to show me that you thought was interesting? [1:20:10]

DK: I told you that one, I couldn't believe how I old I was (laughs) Let's see. That's the first. Yeah so this is the report of the camera, and this was the first project I did putting the camera down in the reactor. You can see a lot of this stuff is just schedules, making sure everything was there on time and who was doing what parts and that it would work once it got there. When you look at a picture like this of the reactor itself, this looks really really big. (laughs) I think it was 12 feet in diameter. (laughs)

EF: (laughs)

DK: And this is all very compressed, so all these pipes are very close to each other. It's hard to even walk between em. But that's where we were on top of that. Putting the camera down inside. So that was the first thing I did was put the camera in, and this was that task force where we decided we couldn't, originally they were gonna fill up the canal with water. If they even show those, the different options that they were looking at at the time, but I was pretty. These seem like little cartoons now, they don't even look like (laughs)

EF: (laughs)

DK: To think this was what we looked at to figure stuff out. So this confinement barrier was my, the main idea that I had in terms of putting that on top of the reactor and working just within the reactor. Before we did that, they were gonna fill the whole thing up with water, and gonna be 30 feet of water. And I was sitting there, and I'm only 2 years outta college and I'm sayin we cant do this.

EF: (laughs)

DK: This won't work this way. And I'm think back on it now, some kid 2 years outta college sayin that, like would I even listen to him? (laughs)

EF: (laughs)

DK: So, anyway. Maybe this was the one that showed the different methods. Oh Robert Blumberg, this was an older guy that I worked with. He was really neat. I often wonder where he is and where he went.

EF: (laughs)

DK: And then this was in '85, after it was all over and we had everything designed. Bob Ryder and I, Bob was the head of the whole project for Bechtel. He allowed me to present with him to the Nuclear Regulatory or the Annual Nuclear Society meeting in Boston. This was our presentation to them about how we did it, and how we came to understand the pieces and the decisions that got made. The dry fueling work platform, so this was dry fueling verus filling the whole canal with water. This was the deck, we put a very thick deck on top, it was like 6 inches of lead so people could stand on it and all the radiation was then contained inside here.

EF: Okay Thank you!

DK: Yep. That's all there is and there is no more. (laughs)

EF: (laughs)

DK: Thanks for taking the time.

EF: No, thanks for taking time to do this, to let me interview you.

DK: You can turn your recorders off now.

EF: Yeah

[Interview Ends 1:24:22]

Interview Analysis

History is the process of selectively collecting primary and secondary sources to interpret with objectivity, as explained by Tuchman and Carr. It is about converging evidence into a compilation and not letting biases or unconscious preconceptions interfere with those interpretations. When collecting information about a certain event it is important to learn about all other people, places, and countries affiliated with it. By interviewing Dennis Kelly on Three Mile Island, I gained a substantial amount of information that was not retrievable through traditional research. Oral history helped me gain a point a view from someone who was there when the accident happened and during the cleanup process. He was not someone who would cover anything up, and he was educated enough to know when the media was stretching the truth. By gaining new perspectives on an event we can further understand the different ways it can affect people and how others perceived it differently, thus providing knowledge on the event that is out of a textbooks reach.

As Donald Ritchie states in his book, *Doing Oral History*, oral history is the collection of "memories and personal commentaries of historical significance through recorded interviews"(qtd. in Whitman 3). What makes it different from other historical sources is how it forms many stories and personal experiences that can be one-sided, far-fetched, or even more realistic than history. An oral history can come from many different types of people who were involved or not involved in the events. By using oral history we can learn, not only from documents, but also from actual eyewitness accounts of those who were there during the event. With this we can learn all the different views from various people for one event and how they all differentiate and interact. This teaches us that history affects everyone in many ways, good and bad. The difference comes from the ability to gain personal accounts as to what they believed

happened, what they went through, and what people around them were thinking. They are not just collections of facts from primary and secondary sources that have been formatted in a timeline for a textbook; it comes from real people who went through real tragedies and felt real emotions. By using these personal memories we are converging evidence and using what they teach us and what we already know from research to form a better knowledge on what happened. Donald Ritchie ended chapter one of his book by stating, "That is the reason for doing oral history: to ask the questions that have not been asked, and to collect the reminiscences that otherwise would be lost" (qtd. in Whitman 8).

Dennis Kelly had made some very interesting points in the interview. We talked about his view on the media, the government, and his interactions with Three Mile Island. He was very interested in health care, "The hard part for me to understand today is when we passed the bill in 2010, it was supposed to lower the cost of health care, or lower the cost of health insurance and now every story you read is why the cost is goin up and why the bill is gonna cost more money and add more costs and add more complexity" (Kelly 29). This is he talking about a deception between what was supposed to happen and what actually happened. What was very important to him was the way the media was displaying what was happening. I asked him about how radioactive particles had been released into the ecosystem and he said, "It was such a small amount that I really, I wasn't worried. I remember the public overreacting to it" (Kelly 35). His point of view comes from the fact that he was an experienced engineer who was involved in what was going on and so he knew what was happening. Dennis and his crew were aware that what the media was displaying was not as serious as they made it seem, and the public was overreacting from a lack of knowledge. Richard Lyons wrote an article, "Children Evacuated", in 1979 about how the Governor felt the radiation was threat enough to evacuate people within a 5-

mile radius. These two point of views contrast because its public awareness vs. facts from experienced people. Leading from that point was when we talked about the alpha and gamma rays, “So the other thing I don’t think the public understands very well is there’s alpha radiation and gamma radiation” (Kelly 37). He explained to me that gamma radiation went through the body and was less harmful, as alpha radiation did not and could stay on the surface of skin. The public was not very aware of these two different types of radiation and perhaps if they had known then they would not have acted so extreme. Dennis also did not believe anyone had been trying to cover anything, including President Carter, “I realized he wasn’t a very good President, but he was a good engineer and he’s a good man” (Kelly 46). He had a strong connection to President Carter because he was also an engineer and thought he was doing his best for the country, especially when he came to visit the reactor, “So, I do remember that being a good thing for the country and I remember feeling like, alright go get it, go tell em it’s safe” (Kelly 35). Dennis seemed to be very passionate about engineering throughout the interview as well as hoped the media would have informed the public more factually and realistically.

The historical value of this interview is huge because there is a gained perspective from a man who is experienced and well informed about the event. He was trained to work within the field that the accident happened and was not as afraid as the public was. This interview has a point of view solely based on someone’s perspective during the event and not just on what the media had said. It helps people learning about Three Mile Island form a perspective that is more technological rather than from a bystander. Dennis spoke as an individual working on the plant that did not have anything to cover up and was experienced enough to know what was actually going on. But what is not included in this interview was some of the depth because of a lack of memory on what the media was describing what happened. When I asked him what he thought

when Governor Thornburgh told women and children to evacuate he said, “I don’t remember that order. I mean remember it, again, in hindsight but I don’t remember that day when they were actually doing it” (Kelly 34). From that we can understand that Dennis was not very overwhelmed with what the media was portraying. The media and common people know that the accident occurred because of a human-computer error, but what they might not understand is how this was a rare accident. “They thought they were protecting the reactor, but they were really, they were defeating the reactors own protection systems. So, that was the human error that was made in terms of overriding the systems that were designed to protect against that stuff” (Kelly 32). From that we see how Dennis speaks of the human’s part in the error and how the supervisor was not listening to the equipment. But from this mistake Dennis spoke of how many other plants were then prevented from this happening.

This transcript challenges the contextualization paper because it gives a more personal account as to what happened and not a textbook view. Because Dennis has not been interviewed on this topic before, the world has now gained his perspective of what went on. We have learned his part in Three Mile Island, and how Jimmy Carter was an engineer and that was why he went to the plant. Dennis contributes his thoughts and beliefs into the understanding of the period. He gives the behind the scenes information rather than what the media and the government try to show. As a whole, Dennis fits by being one man who had taken his time to share his story with the world, and potentially answering those questions in the future. Although Dennis was not very factual, the context paper did back up the time when President Carter visited the plant, “As President Carter and the first lady landed on site Denton had to explain the miscommunication and give both sides of the stories to reassure him that everything was safe” (Farago 15). There was not much else that Dennis could have said that couldn’t be backed up by the context paper,

but I believe if there was anything that it could still be true. Dennis' point of view on the event, however it may differ, is not wrong compared to the facts. Not all people see the same thing the same way. Without Dennis, a project on this event would lack an inside man who knew what was happening and was involved in fixing the accident up. After this interviewee, a person that went in as one of the first men to begin cleaning up the accident would be the next person to be interviewed. The first men in were at the highest risk to radiation because no one knew what was in the plant. From this interview, we gain a personal account and not just another textbook telling us what happened; we have a primary source that is reliable.

From the oral history process I learned many valuable points. When doing a research paper it is good to converge sources because there should facts from a variety of sources. It is good to have information on an event from both primary and secondary sources because then knowledge is gained from many points of views. But as I was collecting information on how nuclear energy came to be I found there was a limited source supply. There was only one main source from the United States Department of Energy that really gave a valid and substantial amount of history on the creation of nuclear energy and the process people took to get it the way it is today. Although this is not a convergence of multiple evidences, I do think that because it is a piece from the government that it has to have validity and not be as biased. I also learned that information and research is not the only kind of source out there. Interviewing someone is just as important because a source is formed from someone who was actually there. No longer is there just evidence from documents and books, but now there is information from someone who was involved and saw things from a different perspective. It forms an perspective from whomever is interviewed, whether it is a soldier, bystander, child, adult or government. It makes an appreciation for history.

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