The Reminiscences of Bill Durr

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Q: This is Michael Conrad with the Indian Point Heritage Project. I'm here with Bill Durr in Beacon, NY on October 22nd, 2020. My first question: If you could say your name and spell it, please?

Durr: My name is William, W-I-L-L-I-A-M, nickname 'Bill,' Durr, D-U-R-R

Conrad: And you want to go by Bill?

Durr: Yes.

Q: Bill, could you tell us a bit about how you got started before working at Indian Point? Education or life experiences?

Durr: I was a local person, born in Peekskill, grew up in Buchanan, attended St. Patrick's school in Verplanck. [St. Patrick's] was a Parochial school and on those days where we went to church, we'd walk from school to the church and I would see Indian Point in the background as the stack got built, so I knew something was going on there. And then I attended Hendrik Hudson High School, which is in Montrose, all local still, and then attended the state university college at Oneonta. I got a job there as a timekeeper, the job was just to follow a couple dozen people around, who were quality control inspectors. Guess one of the individuals was not on the job

doing what he should have, so they decided to hire someone to check on them, so my job was to walk around a couple times, checking on everybody, making sure they're doing their job. Basically my background, [unclear] in school was more math, science, those types of classes going through high school.

Q: How did you find out about the job opening at Indian Point and what year was that?

Durr: In February of 1973, while I was working at this job as a timekeeper, following up on the others, and one of my father's — who was a carpenter at the time — friends, who we knew from living near in the village, this person was a ConEdison employee, they saw my dad and said, "Hey, they're giving a test for operators, this is through ConEdison at Indian Point." So, I went to my boss and said, "Hey, can I have the afternoon off? I got to go do something." So I went down and took what they call the [Nulgul? Unclear] test, this test would just allow you to get in and get a job, basically math and science questions, stuff like that, some with little bit of basic nuclear physics type theory, it was high school physics, but it was really just to understand that you had a background in math and science and you had the aptitude to do the learning, that you had that learning ability there. It might have helped me, because my dad was a village councilman, so I'll never know if he spoke to anybody else and helped give it a push. But my dad was there and the other thing, which I subsequently found out, was that my grandfather back in the 1950s, he was a village councilman also in Buchanan, and he was involved in making the motion and the resolution to amend the zoning ordinance in the village, because they had a height restriction, but he did that so they could build an atomic energy plant for the purpose of generating electricity. I never even knew that until a few months ago, when I was cleaning up some of my father's old paperwork and I found an old 1957 political advertisement that he had saved. So, they were there and helping, I took the test, got told that "You passed it." I started out,

basically, as a what would be a field operator. They sent me to Unit 1 to learn how to be an operator in what was the water factory, where they took city water — which is just the water that would come into your house — and purified it. So after spending a couple of weeks there, they needed the operators on Unit 2 more than on Unit 1, so they decided to send me to Unit 2, filling a slot there instead, because at that time both Units 1 and 2 were operating. So I spent my time learning what a field operator would have to do at Unit 2 and becoming a qualified operator.

Q: How was the water purified?

Durr: As water came into the plant, it went through a series of filters and demineralizers and different beds to remove ionic impurities, and other impurities [because] contamination in the water would cause corrosion in piping and other systems. That's why contamination was eliminated, [because] corrosion could cause failures, so we wanted to ensure that the pipes lasted the full life of the plant.

Q: What were your thoughts when they switched you from Unit 1 to Unit 2?

Durr: I knew Unit 1 was an older plant, Unit 2 was brand new, so I thought it would be better for me, going to the new plant because when I got there in March, Unit 2 was not even in service yet. It was in May of 1973 when reactor went critical and started making power. So, I was there for the initial parts, and it helped for the first couple months because you could walk around, there were no areas with any radiation fields initially, so you could go into all different parts of the plant before they were opened up or filled with water or fuel, or anything like that.

Conrad: At this point the whole plant was owned by ConEdison, was NYPA involved yet?

Durr: No. NYPA was not involved, all three units were owned by ConEdison, at this time. Unit 3

was still under construction, Unit 2 was just starting up, and Unit 1 was in service.

Q: What was training like to get you ready to be a field operator? Do you think it was it more formal or on the job training, or was it a combination?

Durr: There were a couple of instructors at the time but they weren't working at — I was the operator in the field and the instructors were on a trailer down at the dock. So they would meet with you, provide guidance but it was more training on your own. You got a description of the different systems and how they would operate, so you could read that and then they more or less had a qualification checklist, where you would walk around and go through each system, sign that you had looked at the procedures associated with that equipment, and get checked out by a field operator who was operating the equipment and then at the end of that, you had to get signed off by the shift supervisor and Operations manager. The Operations manager would take you for a half a day walk around, just asked whatever he wanted to. But it wasn't a lot of classroom training, it wasn't as formal — because over the years, [the training at the nuclear plants] really transitioned and back then, "Here, learn from your fellow operators," it was more them transferring their knowledge and experience to you while you questioned them, followed them around and did it. Now it's a systematic approach to training, a lot more formal, people will bring up items, ask "Do I need training on this," determine if it's needed, then they'll lay out a framework for what the training will be — they have a classroom and the qualifications — and they have certain on-the-job activities where you have to go out and do a job performance measures and stuff like that. So, it's gotten way more formal over the years and it's a full blown training department now, whereas back then it was just several people doing it, working with you to get qualified.

Q: Can you run us through a day as a field operator?

Durr: A field operator's job is really to monitor the equipment that's out in the plant — not in the control room, the control room has all the switches, indications, high level controls to operate the equipment. First thing when you come on shift, the person that was on shift would have to have the information written up on a turnover sheet, "Here's what I did, here's what went on on the last eight-hour shift." It was eight hours a shift at that time. He'd have a log book where he logged what he did throughout the shift and then there was a round sheet where the important equipment, because a lot of it is not indicating in the control, where you would log down ever four hours, certain parameters to see if they're trending up or down, because if you don't have them written down, you couldn't tell. So your job was, as soon as you come in, get the turnover and once you have that, the crew would get together, discuss what was going on on that shift and then you'd go out and do your set of rounds during the beginning of your shift, checking all the equipment that was out there and then you'd do it again half way through your shift, four hours later. If you saw any parameters that were out of — there was a designated band for every parameter on that machine, so you would document that on the log sheet by circling it and you would also make sure your supervisor knew that these were out of band in the little notes section where you would write down the reason why it was out service or why it was deviating. The other important part when you made your rounds was understanding there's [aren't?] automatic, if there are issues with the controls, they can be controlled in manual and it can still operate and stay online and make electricity, which is your job. But whatever ones are in manual, you'd have to monitor a lot more closely as you go and do it. The other thing that each day, equipment was taken out of service so that broken equipment could be fixed and then it was put back in service, so it was your job to isolate that equipment and apply a "tagout", a tagout was where you would

put tags on the isolation valves, the power supply, everything there so that it would make it safe for the Maintenance people to work on that equipment, and once they completed that work, you would clear the tags, fill the system, vent it, and place it in service as in procedure, working with the control room or the other operators as you did that. So, that could change every day and the goal was — obviously that the equipment would not break, but obviously it does, so that's why you have to take thing in and out of service and adjust it — but the important part was really monitoring the equipment to make sure that you don't have any system that going out of control. Specifically, like oil temperatures and things like that, they have to be within a band to ensure the equipment doesn't break, so it's your job to catch things before they get to the point of causing damage in the plant.

Q: How long did you work in that position?

Durr: Six year, from 1973 to 1979, I worked as a field operator. Really, by putting your hands on it and visually seeing the equipment, putting your hands on it and knowing where it was, it made your life a lot simpler as you progressed up to being a control room operator, because it's not just like you're turning a switch, and all you see is the switch, like something on a computer or a light switch, you knew what was at the other end and that visualization of what's at the other end of it, what you're really doing when you move a switch make a big difference in your ability to understand what's going on in the plant.

Q: You worked at Indian Point when Unit 2 and Unit 3 were divided between ConEdison and NYPA, how did that unfold and how did you react to that event?

Durr: It all occurred because ConEdison was having financial challenges, so they sold Unit 3 to the Power Authority but that was in the mid-70s, Unit 3 was not running yet, Unit 2 had just

started up recently — we hadn't even had a refueling outage yet — so it wasn't like we had developed a lot of cohesion between the two units, and everyone separated. I mean, the licensed operators that were training to operate the other [unit], we poke to each other but it was like, "This is a Unit 3 class to run it, here's the Unit 2 operators." So, as operators, we weren't really combined yet as helping each other out or doing anything, so the separation, initially, wasn't as bad, it didn't impact what I did. With Unit 3 not running, the maintenance people really hadn't gotten into doing a lot of maintenance on it yet, so it was just that the people separated, which some of them you knew a little bit, some of them you didn't, so it wasn't a major item. But then, as years went by, we never — even though we were right next to each other, the wall went up because it was different properties, one was NYPA and they had their security organization and ConEdison had its, so there was a fence between us that we didn't cross often. It wasn't until almost 2000, the late 1990s, when people would maybe talk to each other a little or lend a person or two to each other. But we didn't go back and forth, it wasn't like we met once a month and asked, "Hey, what are your problems? What are mine," it was like, "I've got my problems, you've got yours, separate work on it." So it wasn't until Entergy bought Unit 3 and bought Unit 2 that we worked forward to combine and work with each other. And even there, after almost thirty years of operating separately, there were challenges getting people to work together, you're all located physically in different buildings, where you had to take a five-minute walk to get to the other site and the organization, so the Maintenance departments were separate, the Operations departments were separate. And it really got to be, when we were working together — not on individual site issues, we would help each other periodically — but in an outage, we all had to help each other so that we could get the plant back online. So it was later on, when we combined and focused on getting outages done more effectively where the whole site worked as

a team that the stations came together more and drove — one of the jobs I'll talk about later was I was involved in the operations group that planned for outages, so now you've got people from both units thrown in the same area, planning something, it's when you're working on the same thing together that helps bring the team together. But that wasn't until the 2000s, in the beginning there was no helping of each other.

Q: During the initial years, was there anything that stood out to you?

Durr: [Pause] The [part?] which amazes me is as an operator I made $3.15 an hour when I first got hired, and then when [I] got qualified, I got $5.85 an hour. It's just amazing when I look back and look at the salaries of today and what [unclear.] But then, I was very happy to make what would now seem like nothing, but the other thing was when you first there it was like, "I have an opportunity—" I assumed I was going to be working for ConEdison my entire life, back then this was a job that I would always have. Now the job has, the companies have changed, the site's the same, but it really surprised me. But you had a future with an opportunity, something that could grow. The other thing stands out, as you go through the years, it's always the people that make the difference, who you're working with. Initially, being in a nuclear plant, they drew from the nuclear Navy; the people had the background, they operated nuclear submarines, the plants that had similar systems but were a much, much smaller design and they were different. What they found was as the nuclear Navy guys — a lot of them took the jobs they could get as they came out, not necessarily in their home towns and where they wanted to be — so, people would come and they would then go back to their towns. That's where, when I first started, we got the opportunity to hire local guys, which was part of the reason I was in there, and— now they have like six operators on a crew and five crews, so they'll have thirty field operators or more — back then, we couldn't keep [that], the low point was we had eleven people for field operators, so it

was very few. We had three three-man crews, and two extra guys and you more or less work and when you did that, it was overtime, so you were working like five or six days a week, for the first couple years until the stations could get more people there, hired, qualified, and going forward. The other thing was, some of the challenges in the first several years, even equipment wise, with design — our goal is to run for a full cycle between fueling outages, so it's basically to run for almost two years without tripping offline — there was one day, back in the '70s where the plant tripped three times in one shift, which means you had to start it back up and trip. But the problem was that the design of the plant had the feed water valve — which puts water into the steam generators — and it was a fourteen-inch pipe that it went through with large valves that were very difficult to control, and when you start up it wasn't automatic, so they're all in manual. Eventually, this led to a design change, where they put in, for each steam generator, a six-inch line with a smaller valve, a lot more fine-tuned control, and we learned. But tripping was bad, you weren't making electricity, but when these plant transients occurred, you learned what you were doing, you had the time, you had to adjust, you knew what to do to respond to that. It just shows that back in the beginning, we were challenged a lot, back in the late '70s, we were very proud of our record when we finally ran 118 days straight at Unit 2; it was a challenge but the people would do modifications, change the equipment, and we'd held each other learn to control feed water, but that continued throughout the life of the plant where you kept aiming to get better and better performance as you went on until finally, in the mid '90s, we actually held the Westinghouse record for a Westinghouse plant, which was a pressurized water reactor, we ran 616 days in a row. But that was a hard struggle all the way, especially in the beginning years, where the equipment really wasn't as fine-tuned and we had to hone our skills, so we knew how to operate it as effectively as we could.

Q: What was your next position after field operator?

Durr: After field operator, the progression is to go into the control room and be a reactor operator. At that time, there was one senior operator in the control room and one reactor operator, both were union positions. I got that opportunity in 1979 to go to school to be a reactor operator and get my license to be one in 1980. The process for that is a lot more formal with the training then [the field operators], there's a full-blown course of instruction which you get from training instructors, so you get the class on all the systems and as you did each system in the plant, it would go into a lot more detail about how they operated. The other major difference is reactor theory: how the reactor works, what you're actually controlling, how the nuclear reaction itself occurs, all this training was there — from a thermodynamic prospective, a steam cycle, the whole secondary plant with the steam turbine, the feed water system, the condensers to condense the steam, the whole physics behind all of that was taught to you so that you could understand how things works. The simulator was the big difference, it's a full simulation of the control room built into the exact design, layout with all the switches, all the controls, and the instructors could throw scenarios at you, so they'd simulate a pipe break or something else, you'd have to respond utilizing your procedures, to ensure you maintain the safety of the plant. So it's a lot of learning you could do and basically, it allowed you to progress forward — and that's what I was looking for, I was looking to learn more, get a better understanding of the plant, and then move up into the positon. I also got to learn a lot as a reactor operator, we had five different crews so — [27:30-27:33 Banging noises.] 1980, I got assigned to the 'A' team, it was just 'A' through 'E' but it's designation was 'A,' so the "A-Team" was a TV show and he[?] really pushed it to the limit. Our supervisor was a guy named Harry, he really taught me a lot. He taught me more than anyone else while we were there but he challenged me too; anytime he would say, [puts on

accent] “You get your turnover, —” I guess it’s trust but validate, [Laughs] you believe what they say until you put your eyes on it. And even if someone told you that they lined it up and you could put a pump in service, no, no, no, you had your guys go out and double check it, make sure it’s right because if something goes wrong, and they didn’t do something right, now that you’ve progressed forward in it, you’re responsible. So, Harry taught us a lot and he always thought that we had to do it better than anyone else, whether that meant efficiency, other items, he was the one initially that really got me into [thinking that] the preparations for what you’re doing is more important. Harry had us really look ahead about what upcoming, what are you doing, he drove us to be the best that we could. Back then, even the procedures aren’t as high quality as they are nowadays, they just developed over the years and people would do better and once, as a reactor operator, I sat there and Harry — there were two supervisors on each team, one was the Unit 1 supervisor and one was the Unit 2 — so they both came into the control room, sat in their chairs and just watched me. By yourself, just start up the plant one night from 20% power up to 100%, just you got it, you do it, you do the whole thing. But it allowed was to learn a lot more and understand a lot more having done it. Now, they challenged me all the way through, with every step I took and did it, but I really learned a lot as I was doing the plant. He also challenged us — I think I mentioned before that some systems can be in automatic, some in manual — it was like seven years, 1973 the plant went online, it wasn’t until 1980 when we got our main feed water pumps to work in automatic. I was on as a reactor operator and we were the ones who put it in automatic but it was a lot of effort over the years, getting the controls to work right, how to do it, and how to place it in automatic. So, he challenged us with everything, and that’s what pushed me through the rest of my career at Indian Point, that you have to prepare, challenge, and do it. There’s a lot of power in a nuclear power plant, and you’re responsible for ensuring that you’re

operating it and keeping the public safe, and those things were stressed by the supervisor, that we do it, do it right, and do it efficiently.

Q: After you served as a reactor operator, you then moved into the senior operator position, what was that like?

Durr: Reactor operators [were] the ones who really had their hands on the switches, turning components on and off, opening and closing valves, so you had to have a very good knowledge level of the plant. Senior operators were the one who sat behind a desk, looking at the control room panels, and he was the one that directed the reactor operator taking those actions. You had to go back for another year of school and back through the simulator to get the senior license. But what it meant was that now you had the authority and the responsibility as the senior licensed person of making sure that the plant was operated safely. You weren't the person putting your hands on the switch, manipulating it, but you were the one responsible for giving the guidance to the other person on what to do all the time, so you had to have a lot more in depth knowledge about how the systems operated, the plant operated, and tell the others what to do. You were also responsible for giving guidance to the operators in the field; the reactor operators you could see, you could watch what he's doing, if you thought he was going to do something wrong, you could question him and stop him there, as you communicated each job and task to the field operators, once you had communicated it, you had no idea of what they were actually doing in the field, unless they called you back and did it. So you had a lot more responsibility in that area, because you had to tell them what procedure to use, to place a component in service out of service, or if you isolated, the sequence you wanted it done in, give precautions to them, of "Here's the limitations of what you can do while you're doing it." You also to tell them how often you wanted them to communicate back to you, or when or call you

and look at it. So it was a lot more challenging in that, you're telling someone what to do but you're responsible, so you have to make sure you've given all the guidance of how to do it, when to do it, when to communicate, to that person and get that back. You also looked farther ahead, a reactor operator was looking at what he was doing in the moment, and during the free time, when you're sitting there not doing that, it's more "What's coming up the next day, what am I doing here," so it's not only looking at what's on going at the moment but what am I doing later in the shift, tomorrow, making sure you're accomplishing everything. And then the senior person is also reviewing all the logs, making sure there are no anomalies on going, because where field operators would write the log, it was your job, at the end to review it and make sure he wasn't missing anything that he should have caught but you're the overall person responsible for the unit through the control room as the senior person. So, each one of these jobs gave you a lot more responsibility, a lot more knowledge, and it just felt that, as you're growing here, you could do a lot more to help the plant be better. [By?] Individual ownership, as you're growing through these, it's just at each stage, from field operator, to reactor operator, to senior operator, you felt that ownership, you felt positive, you felt good that you were operating better and doing things, and you could [drive?] where you went, the performance.

Q: What does a shift manager do? And what's their position in the hierarchy of the control room?

Durr: Initially, we had the one union reactor operator, one union senior reactor operator, and then there was the management each shift, so there was one shift supervisor for the unit. So, he was the management representation, he was previously a senior reactor operator in the control room, typically he did still have an active senior reactor operator license but he was the management representative. Initially, he was the only on each shift, so his responsibility was to make the final

decisions on what would occur, what work would occur on each shift and he would communicate with upper management in the company if something was going on or occurring and if help was needed. It stayed that way throughout the ConEdison term with the shift manager as the only management rep. for that unit, there was a Unit 1 management person also. Unit 1, after it shut down in the '70s, it still had systems that supported Unit 2, it made the water, it had house service boilers, it had waste processing units, so we did have to have three field operators at Unit 1 and one supervisor, but when that was ongoing, that Unit 1 supervisor reported to the Unit 2 shift supervisor, so there were several management people and they made the decisions. When I was an SRO, I had, as my shift supervisor, a guy named Bill Smith, a very good guy, worked there during construction — his father worked there too! What was unique here was his father had been [at Indian Point] in the '60s, working on Unit 1, so his father was the Unit 1 supervisor, and he was the Unit 2 supervisor. ConEdison had a rule that you could not work for your parents, if you were both worked at ConEd, well it was "you couldn't work for your parents" there was nothing that said the father couldn't work for the son. So the father [laughs], based on hierarchy, was at Unit 1, working for his son who was working at Unit 2 as a shift supervisor. But both of these Bills really taught me a lot; Bill Smith, the shift supervisor, was also my instructor in my license classes, and his dad at Unit 1, he had a lot of experience also, so they both really coached me through that. Eventually, after the Senior Reactor Operator [position], they moved me over to Unit 1 shift supervisor, which was the lower level, and this was after Unit 1 was shut down, so there was no Unit 1 license required or anything like that. You just watched the field operators, making sure that the water was made, the waste was processed, the boilers were working, stuff like that. So, I was working as the Unit 1 supervisor, and my boss, George, had some discussions with the Operations manager; I had only been a Unit 1 supervisor for a few months, the Ops.

Manager, Harry, who was my first supervisor, he had spoken to me when I was a senior reactor operator, there was opportunity to move up. He described what I'd get for going from Union to Management and this and that. And there are sometimes that I wish I had sat in that chair in the control for a little bit longer, because I was only in there for a couple years and there's only so much you can see, but I decided to take that step up to Unit 1 supervisor. So I was still learning the Unit 1 stuff, being in there for a few months, and then my shift supervisor, George, decided to have an argument with the Operations manager, Harry; so, Harry wasn't happy with George and the next day, I come in and he says, "Bill, do you want to be a Unit 2 shift supervisor?" And [Laughs] "Okay, yes!" So what the Ops. Manager did was he made my boss work for me instead of me working for him, [continues laughing] it was a very unique situation when your boss gets in trouble and now he's working for you. That's how I got to the shift manager job in 1985. But [when] you're the management person, you have the overall responsibility for everything, you report up the chain to the company, but you make the immediate decisions at that time; are you going to shut down the plant, are you going to do something, do you have to notify anyone, do you have to make declarations in the emergency plan? The emergency plan is meant to notify people in the public that there's something going on at the plant, so it was one of your key responsibilities as the management shift supervisor to, if something went wrong, ensure that the four surrounding counties would all get notified and that you would assemble the emergency response team to come into the station to do the work. But the shift manager, that really allowed you an opportunity to think longer term, higher level, and he was — when you say "The buck stops here," that was him. He's responsible for that job.

Q: In 1990, you switched to the next position, which is assistant operations manager. How did that work and what did that position entail?

Durr: The assistant operations manager is a day shift job; you basically represent the operations department in running the shifts' duties. So, the five shift supervisors would report to you and you would have to put out a night order book, what they're going to do, how they're going to progress. You're responsible for long term actions, looking ahead when it came to laying out plans, [unclear] the department you were responsible for that, if there were staffing issues, making decisions, making sure the crews were properly staffed, you did that. Feed water control became a problem in the plant, you go back and look at "What do I trip from?" Our goal is to operate the plant safely and stay on line, so we had issues with start-ups, feed water systems, so where initially we had modifications we had to do to the feed water system to get feed reg. valves that had more control. Then we recognized that more than one shift had issues starting up the plant and how they controlled it and what they did, so at that point it would be my job to make sure that the training of where our weaknesses were addressed those items and make sure they resolved them. That even involved getting involved in the simulator training courses on the feed water, making sure they were effective, because there's different ways to operate systems, different things you can do. Even when it came to people's performance, how each shift performed, I monitored those, because I would do the performance reviews for the shift managers at this time, "Are they doing their job, what do I recommend to them?" So it's, as you come in and out each day, providing feedback and coaching to the people on how we can do things better and things they did [well], but it's also the long term prospective, "What do I have to do for the department for it to progress?" So it was a lot of looking at all of those items and as a system operations manager, now you were less on what each shift was doing, but you were down at the station's department meetings with the jobs that were ongoing each day and all the work, and you were leading that effort, coordinating between Maintenance, Rad Protection,

Chemistry, Engineering, all the different departments, what was going on. So you turned into more or less the stations lead on what was going on, how we progressed through our work and everything else we were doing during the day, because as operations team, you had the lead at this station, to make sure it's operated correctly, and that includes making sure that everyone else is supporting the operators and what they're doing and how they're progressing with the work in the station.

Q: Were there any days that stood out in your memory?

Durr: As a shift manager, there was one day where I was — shift manager didn't sit in the control room, initially, they sat in an office right next to the control room because it was your responsibility of the senior operator to run the control room, the shift manager was in the field, in the control room, went around where ever he wanted to check up on items. So, all of a sudden I heard a noise, it was water hammer coming in the plant — a water hammer could be either when a valve is operating improperly, cycling a lot or when you have steam with changing plant conditions where it hammers up, in this case it ended up being a condensate system flow control valve that was hammering. So, I run down — I don't know why sometimes — but I run down into the field, and I see the valve cycling open and shut, and I notice that it would bang a pipe and the pipe would move around and then it would sit fine for a moment, then it would stay stable and then a minute later it would do it again. So I timed it so immediately after it cycled, ran up, jumped over the one pipe, threw it in manual, and just had it sitting there, and then it all stopped and I could see underneath it that a couple of the supports were bent a little bit. It was just — this stood out to me in several ways — it's just, I responded more just as a reaction: jump, what do I do to fix this? Now when I look back, sometimes I say, maybe I should have just told the control room at that time to trip the unit and not run down there and jump over it, get out

there now. I was happy I did it and stayed online, but then again, you've got to look at it and say what risk you [are putting] yourself [in] [Laughs] as you do these things. So, it made me think a lot more about what happened and that was one day, initially there, there were when I was assistant ops. manager that we had to look ahead at what problems were, what we did. We were planning an outage to fix a pressurizer spray problem, it's small valve that sprays water into a large pressurizer, which has steam in it, and it controls the pressure on the nuclear side. So we're planning it and looking at it but normally we would, to control pressure later on, put nitrogen into the system, do it that way. Well, we couldn't use the nitrogen system to get a bubble because we couldn't get the pressurizer down to that level, where we could get the nitrogen in, so, we knew this ahead of time, we were planning it. As an industry, we work together, Westinghouse was the designer of the reactor plant, the turbine plant, so they had a lot of the systems and something called the "Westinghouse Owner's Group," so we would send people to these meetings and they would discuss issues, and these two gentlemen knew because of how we operated our pressurizer, with the nitrogen bubble, we couldn't get into this concern that was out there, where it was a cool down issue. Well, unfortunately, while we were planning this, the several weeks during the outage, this operating experience wasn't brought up again because both these gentlemen were away, the two that knew it that you can't do this, we never got this operating experience into our system. So, the item came up, we came up with a different procedure to spray the pressurizer from the bottom, as was done in the Navy, we had guys with Navy experience, but it's a different reactor plant. So, we wrote a procedure, did the change, and the two individuals who participated in the Westinghouse Owners Group weren't onsite for that whole time, so I'm working as assistant ops. manager for the shut down, and I get called to the control room because our liquid temperature, which is at one height in the pressurizer, is going

up and down, over three hundred degrees in less than a minute. So, what it is, is you end up getting a layer of cold water under the hot water and the steam right above it, so it will go up and down and osculate. Well, you're not supposed to do that; fortunately, we did not cause any damage to the plant or anything, but it just showed how important it is to be participating with the industry and having this stuff communicated. We thought we could never have to operate the system this way but if people are out, you have to call them, you have to get your experts, you have to do what you have to do. But it was unique to me and I learned the lesson, so understanding who the experts are in the area, getting them all involved — I started my morning at six o'clock that day, at eleven o'clock that night, I was still there based on what had happened in the afternoon and I was so frazzled and frustrated, it was the only day I had to call up my wife and say I couldn't drive, "Come and pick me up, I need a ride home," so that I could try to sleep that night. But it shows that you can get so involved with the items, you have to — things will go wrong, how you respond to them — but that day really sticks out in my mind, I'll remember that one forever.

Q: What happened when Entergy came into the plant in the year 2000?

Durr: I was still an assistant operations manager and I stayed in that position for about a year before the shifts. As Entergy came in, they started emigrating — initially we had a fence up between Unit 2 and Unit 3 with the Power Authority and ConEdison, so Entergy bought the Power Authority ['s unit] in 2000 and they bought Unit 2 from ConEd in 2001. So, as we combined, most of groups were still sitting in their separate locations, their positions, doing their duties as before, but in [places] operations, now we had a systems operations manager for Unit 2 and one for Unit 3 and they reported to the ops. manager who was the combined lead for both stations. So I was doing the Unit 2 shifts and when we did those, we didn't really have a separate

Operations group to respond to outage work when we were with ConEd, as the assistant ops. manager, I would have to take more or less a lead on it, with the other people on it, make sure other people were assigned, that we would prepare for it. But Entergy as a whole, realized we had to do a lot better job with outages than we were doing. So, the ops. manager asked me if I wanted to transition at that point to the assistant ops. manager of outages instead of running the shifts, so instead of watching what the shift's doing part time and preparing for outages and stuff, they want a fulltime ops. lead assigned for outage preparations and getting prepared, so we'd have better outages. We were doing, at Unit 2, seventy-five to eighty, ninety day outages, Unit 3 was similar, if not one hundred day outages or worse, but clearly we knew as we were an unregulated company, that you can't have long outages and not run and be efficient and effective. So, the station decided that they were going have, in operations, a separate group to prepare for the outages and then coordinate the execution of them. This is where I think we — the first thing Entergy did, after they bought ConEd, they helped combine us, they took down the fence between the two stations so we could walk back and forth, then we started to meet and talk but we were still in different areas. The Operations outage group was the first one to have one location and where we combined, so that I had working for me several people from Unit 2, several people from Unit 3, we worked together, we talked and by sitting near with each other in the same room, we learned how each group did it previously, but we could combine and do better that way. But this was how we broke it down, different departments like Maintenance, they on the whole sat separate at Unit 3 and Unit 2 for many years before they came together and I think that [worked? Hurt?], but there's a lot of lessons and by combining, talking to each other and working together, you can improve your items. So I had a person assigned, in Operations, to look at tagout, the nuclear side work, the conventional side work, the testing work that we were

going to do, the electrical work, and it would lay out all these different work windows and coordinate it. And I did that until 2005, but my background for laying out the outages as the lead on shifts at Unit 2 and then getting to be the Ops. lead for both units really helped organize and coordinate — I really understood the importance of preparations that were needed in the Operations group, as far as getting towards being ready to execute an outage effectively. But what we were able to do was we immediately got outages under forty days, initially, as we made our first effort at a couple outages. And then in 2005, the plant manager asked me if I wanted to become an outage manager. I really wasn't keen on leaving Operations, I enjoyed what I did in Operations but I saw this as an opportunity — I did, for a year, keep my senior reactor operator license. So you initially get a license but the training never stops, so once every five weeks, each crew would go to training to get refreshed throughout the year. So, this training never stops, it's just important to keep the [officers?] there and I wanted to keep my license and they said I could. — So, now I was doing the outage job and I was still keeping my license in case I wanted to go back, so every five weeks, I'd go to school and eventually it just got to be too much of a drag me and I couldn't keep up with both, so I transitioned to the outage manager job in 2005. [long pause.] Outage manager has to coordinate all the preps for the entire station for every outage. Now, we fortunately at Indian Point, being a duel unit, we've got our unit on a two-year cycle, which means we would run for twenty-three months and then plan a one-month outage and we also laid it out so that our outages would occur every Spring — the site wants to make power during the summer, electricity is needed. But it also allows us by doing each unit in the Spring and being on a two-year cycle, you could spend a full year planning for a Unit 2 outage then a full year to plan for a Unit 3 outage, obviously somethings are longer term and had to start earlier but we focused on it that way. As an outage manager, I had people working for me, an assistant

outage manager, I also initially had a person that would monitor the turbine work, a person that would monitor the steam generators, a separate person to monitor reactor coolant pumps, and a separate person for refueling. So, each one of those coordinators knew how to run their job and I had to coordinate with all those people done, they reported to me for the first few years, after that they went off to different departments but they still indirectly reported to me. The current outage managers at Indian Point, there's an outage manager for each unit, then an assistant; we work together as a team but one group would do Unit 1, one would do Unit 3. And we had four schedulers which we shared and they helped lay out the work as we went forward. So, four schedulers working for us and Maintenance organization had a Mechanical, Electrical, and a Instruments person. What we did was we put all of us in the one area, so that we worked together with an open area so that the schedulers would be able to talk to the Maintenance people to be able to build the schedules for it, and we also then brought Operations into that same room as well, so that we had an Operations person that would work on the same as before, the test group, the turbine work in the secondary side, and the nuclear side, but they all sat in the same area with [unclear] so they communicate with each other, and this organization helped drive our outage performance to where Indian Point became a plant know for doing good outages and we actually were in the top quartile of performance typically. And in our outages, we would target a twenty-five-day outage duration, best we ever did was twenty-three days and one hour, but we clearly did that throughout the decade of the 2000s and going forward with good outage performance and good coordination.

Q: What did you have to do to prepare for an outage?

Durr: A typical outage, we have 1000 people onsite now, now we bring in about a 1000 venders. So the outage process — back when I was with ConEd, it was less formal more based on

people's knowledge what they were doing and you would repeat what you did in past outages [unclear] — when we got with Entergy in the early 2000s, we ended up getting all the outage managers from all the Entergy sites together, eleven sites, but we get together periodically and we ended up writing procedures for our company to follow as relates to outage preperations, which would get more formality into them. So, we would look at what other — The nuclear industry shares a lot, if anyone wants something, we'll be happy to talk, if you want to copy something and edit it, if you want to call it "plagiarize" it or whatever, that's more than fine. As an industry, it doesn't hide things from each other with the intent of, "I'll do it better and more efficiently than you will," they really do share things between each other. But first thing Entergy did, as outage managers, we wrote procedures in the early 2000s to drive what the process should be. And that procedure has sixty-five different milestones that will keep track of either getting contracts together, how you prepare system isolations, what you do, how you prepare your work packages for Maintenance to work with, how you track materials, each one of these items would have performance indicators as required, so you could track and see the progress being made as you initiate a contract requisition to get someone here or someone to help, and then as you process the contract through all of the reviews and other items. But this was done for all the different areas, so by having these procedures, by having these indicators — you'd have a weekly outage meeting where you'd go over all the key ones, and make a date for each one and they would start at different times. — But the process of preparing really starts two and a half years before and outage starts and you would lay out this plan — which a lot of times would be a repeat — but there's different working [unclear] and then you understand that, and that started —

Actually, I'm going to go back, because this really starts with a ten-year plan I laid out. It was rather simple, on an Excel spreadsheet, but it laid out how often you do the major PMs. The

turbine PM was ten years, it showed in the schedule every ten years, and you didn't have your high pressure turbine and your three low pressure turbines all in the same outage, you spread them out, then you spread the generator out. But every year, I would update this ten-year plan, working with the turbine coordinator, the refueling coordinator, and all the engineers who knew how each system was operating, we'd lay out a ten-year plan and so it would spread out the work and we could say, "Entergy, this outage might be a little longer," based on this major work or that major work, or what components you're taking out. So, that gets you a longer term plan and it also helps you lay out your financial responsibilities with how much money you're going to spend, so as a corporation, you can see that. Then you would lay out your individual outage, starting two and a half years ahead, there were milestones we would track and items that would be laid out, so you know when someone had a challenge with it. And we don't always — if the procedure and the process expected us to have something done six months before the outage start, we would target and have a goal of getting it done eight months [ahead]. What we found over the years, especially when it came to getting the work orders planned and the material ordered, the biggest challenge was industry changes, we have a lot of analog equipment, we're not very digital with the computers and such, and you have to get equipment and it's not always out there and repair and spare parts and replacements. So, it's understanding, when I take a turbine apart, "Hlere are the parts that we definitely need to replace, having them ordered, and here are the contingency parts I want with the plan," these are laid out with the different milestones and actions to track that and we would see the performance. The other part is that besides the 1000 people that are onsite, you coordinate the work with the Maintenance department, Ops., INC — the venders come in. Westinghouse made the original plant, built it. Westinghouse back in the '70s was also a turbine company and they sold that to Siemens, so

Siemens would do the turbines, we would have different valve team members to come in, as another cooperation and Westinghouse would come in with their expertise and people to do the refueling, to do the reactor coolant pump work, steam generator work, and other reactor inspections. But what you're talking is about a thousand people who would come in. So, they started the preparations and we had contacts the year before the outage started also, and our processes included how to involve them — the Westinghouse vender actually, half the time he was working onsite with us, because he had the major work — and we meet with all of them, [they] had goals, we had goals, they both were to be effective and efficient and we get the outage done safely. But for a twenty-five-day outage, there's a like a twenty-day work window because the first day is shutting down the plant, then you have to get tagouts and isolations applied, and then the last three or four days would be starting up. But it would clearly be laid out with those items. And then the Operations team drove a lot of what we did because they would cool down the plant and depressurize it, then once we were ready and the reactor was taken apart, we would have to move the water level and fill the reactor vessel cavity where the refueling is done, and the sequence of testing that's required as we progress forward at different water levels and stuff would have to be laid out. So, we repeat every outage['s] generic plan, but there are a lot of differences based on what equipment is being worked on and when to make sure we're ready. Those venders also got separate reviews. Each high level project, whether it be a major component like the turbine, we would do a readiness review for it, where we would sit with the station management team about four months before the outage and we would look at their preparation status, did they have the contracts in place? The schedule? Did they have their parts? What people are coming, are they people who've worked at Indian Point before, what's their experience, blah blah blah. We would want to make sure they understood what they're doing and

they had the right set of people so that we would be successful. This went for all major vendors who came on site, and then even the internal departments, the Maintenance, the INC, the Chemistry, the Operations, they also got challenge review meetings where they would discuss their readiness for outages. So, as an outage manager, it's really having a framework for the process and the long term, being able to monitor progress, and communicating with a lot of different people, as far as how we get ready. The other thing involved in this is when we mentioned the different industries and people; all nuclear plants have their way of doing it, some people bring in more vendors, some people use different vendors, some people have different processes, so every year, Westinghouse would coordinate a conference that would take place where the outage managers would get together, there were presentations on different topics, whether it be refueling or reactor coolant pumps. They would go over issues that occurred in the industry where people had problems and if a seal on a motor was a problem that was generically happened, they'd discuss what they'd have to do, whether it was the filling procedure, the material, the this — so we could all learn from each other what challenges they had so we could all improve. So, by having these opportunities to meet with all the other people and [learn] what they're doing, it helped improve our outages as we went forward and time and allowed us to be an industry lead at outage performance.

Q: Bill, could you tell us a bit about your last outage that took place from 2018 to 2020?

Durr: Last outage was basically a ten-day outage in May of 2020 and it was a much smaller outage. It was disheartening because in 2017, Entergy announced they were shutting down Indian Point, so this was Unit 2's last outage. I started working at Indian Point in Unit 2 before it started up, so I saw the whole thing from the very start to the very end. And it's disappointing because there was more life in the plant, it could have run longer but for political and financial

reasons, it got shut down. But, the outage was a lot simpler, basically it was no equipment to fix, you just had to the surveillances that are required during the shutdown to ensure that the systems would operate correctly during the shutdown and that they would maintain safe conditions as you offloaded the reactor core, but it was really — The only vendor we brought in was Westinghouse, the refueling team, to get the fuel out, we moved all the fuel into the fuel storage building, out of containment and we just decontaminated the reactor cavities so that we could leave the containment clean there, lowered the level and that was it. But it was disheartening to see the station shut down and take the fuel but it was a ten-day outage, so it was a lot simpler.

Q: In your years working at Indian Point, did you have visits from regulators, agencies, other plants and how did that work out?

Durr: The NRC has, through the years, changed a number of people onsite, when I started it was only one person, it got up to three people onsite with the two units operating. but they would interface with us either in the control room for anything they wanted, the assigned regulators, they would have their periodic walk downs and checks on equipment and monitoring that they would have to do that they would participate in. And if there were any issues ongoing, they would be notified and they would come in to observe what happens. And they just walk around and look at anything they wanted to, so you would see them when you're in operations, they come in the control room, observe what you're doing. As an outage manager, we would brief the NRC on what activities were taking place during the outage, give them copies of the schedule, they were very interested in what our outage risk assessment looked like and what [defense in depth?] plans we had in place to insure that no serious problems occurred, we gave them all that information. Even during the outage, they'd interface with us if they wanted to observe something and we'd call them up at night if something was going to go on, if we were going to

change plant conditions or do something. It was just open ended questions, they were free to ask us and we'd give them whatever information they wanted on whatever happened. Back in '78, after the Three Mile Island incident occurred, the Institute of Nuclear Power Operations was formed, that subsequently has morphed into the [emphasis] World Association of Nuclear Operators, WANO, so there's WANO for the world and INPO [Institute of Nuclear Power Operations] for the United States. That's a resource that was formed by all the industry companies who recognized that if we do a better job with self-policing, we would not have issues with the NRC where they would have to regulate us, so we were going to self-police. The people at INPO act as a resource, if we want to ask them who to see, what to do, who to ask on issues that we have, they would give us advice. Then every two years, they would come to the station to evaluate us, they'd look at how we performed, what issues we had; they'd spend a week gathering up data and then they'd come for two weeks, observe us, how we operated the plant, what we did, how we responded to anything that occurred during the two weeks they were there. They'd observe our maintenance people and other people doing their jobs and ensure that they were doing it safe and doing it with quality. For example, how good our maintenance fundamentals were and if we really understood what we were doing so the equipment operated correctly, so they would come and go. And this was world people too, we had foreigners from South Africa, Sweden, England, many other countries, come to the United States. And we had people go to the other locations too, one of my fellow operators actually had the opportunity to go to Russia to meet people there and observe their plant. The key thing out of all of this is what lessons do you have, and how you help each other with the work, and by having plant personnel participate in these evaluations — INPO would send out a twenty-person team, three quarters of those people would be INPO employees but the other 25% would be people from other plants

who would come. So it's not like it's just someone who doesn't work at the plants coming to evaluate you, it's people who are still active in those operations, so you get a lot of good suggestions and you can learn, the industry's always open, sharing with each other. I had the opportunity in the 1980s to go to Watts Bar Plant, which is a Tennessee Valley Authority plant in Tennessee and down to Plant Vogtle in 2018, for their INPO assessment — that's a Southern Company plant. You just see what they're doing, it sets your perspectives correctly with what you do, it's lets you know — you're evaluating them, you're always looking at you do, and looking to bring lessons back to your plant so you can help improve it.

Conrad: Were those both pressurized water reactors?

Durr: Yes, they both were.

Q: How did technology at the plant change over time?

Durr: We might have, with some modifications and stuff, used different controls, some are now digital as the processes change with computers and items like that, but to me the bigger item is the computer itself. Back in the '80s when you first got it — in the '70s I didn't know what a computer was, everything was hand written, when we would protection to an isolated component, we would hang what is called a tag out and you would list, "I shut these valves, I turned off this switch." And you'd write it all by hand, [unclear] on a draft sheet, and someone would have to come and sign this, so you had a record of it, because you would give the one person that was doing the work the piece of paper and you had the copy of it. But it was all done by hand, so you could have a tag out with fifty, sixty, eighty components on it that you would have to hand write out and you would write by hand these tags that an operator would hang on the components, so anyone out in the field would know, "Don't touch it, this thing is in this

position to ensure it's safe for someone to work on." In the '80s we started getting the computers and it [unclear] because we would use those to make the tag out, now once you typed it in once, you could get it again for the next outage you did, you'd just get a new number on it, reissue it, but everything would come out, you could edit it, adjust it, and save your improvements and go! You didn't have to read it, write it over, the computer would track the process of how many people were on the tag out. The computers were used to monitor the equipment, so instead of looking at a manual log sheet where you tracked the temperature of a component, you now could go into a computer, which has all of the data saved, some of them are recorded directly from instrumentation from monitoring the plant, others are just recording logs that people take manual data and put it in on a computer, and then it gets saved. So, it just allows people to more efficiently do their work and it allows you to monitor the equipment — most of the controls are analog on the site, but there was a computer that was installed to monitor certain key parameters of the equipment, and that's the one where you can go back and see what happened, why, you can track different pressurizer levels, or whatever component you're monitoring. And you can look at what happened, where it went, to learn and change and become more effective at what your procedures or your actions, if you have to take them should a problem occur. So, the computers themselves have really had it very different and simpler, we don't have the challenges with the configurement and the controls of it as much now we can look at all these paths and how we can manipulate the components. The other thing is just the simple act of writing procedures, editing them, and changing them, you find it, edit it, and get out much more quickly. We probably had 1400 people working at just Unit 2 in the early days, now we're at less than 1000 and we have both units combined, so the computer really improved the efficiency and allowed us to observe and take better actions and that was a major change throughout the life at

Indian Point.

Q: Did you have any other family members involved in the nuclear industry?

Durr: [long pause] Sure did! My dad was the one, he built Units 2 and 3, he was a carpenter working in the '60s and '70s, and he would go there for outages as a carpenter to support the work at those times, so he was there. My grandfather, actually when he retired from his job as a chauffeur/gardener working for someone locally in Peekskill, he worked as a security guard [at Indian Point], so did two of my brothers for a little while. My other brother was an engineer, starting working at Indian Point with the Power Authority, he moved on to work at James Fitzpatrick Nuclear Facility in system engineering and he's now working for Tennessee Valley in their corporate offices as a person in charge of Electrical and computer machines. My son, who is a computer type, went to [RPI? RTI?] college and during his college days he came and worked in the IT group for years, and then after he graduated, he stayed there and worked for several years also. So it's been four generations of the family who've worked at Indian Point or in the nuclear industry, and it's a part of us, we grew up in Buchanan, the site's there, we all funnel through it so we have a lot to be thankful for in the opportunities that it gave to us.

Q: Bill, do you have any advice for an aspiring in nuclear or a student that's working towards that?

Durr: Now it's very hard, the industry seems to be in decline, but you never know with the technology what could happen in the future and if nuclear could come back. It does seem in other countries [to be] coming back more, I looked at Georgia, new plants are being built now but there's not many out there. But I guess it's like any different technology, things are going to change, you can grow. If you're a worker, just jump into it, I progressed through and each

opportunity was different; the field operator gave me an opportunity to see the equipment, the reactor operator I grew and understood more of the whole theory how did the reactor worked, what the systems did, what the controls did — as you move up, you change it and you get the opportunity to help the drive how the shift works and what they do or the outage and become more effective— It's like any job I think, any technology, if you can get in on the ground — I was lucky to do that in '73 — take your chances and move up with it and take your opportunities. But a lot of it, as I look back, it's really in the preparations and the organization, it's not always you got to be in the immediate — whatever step you're doing, whatever thing you're doing, it's got to be done right and safely and there. But if you look ahead and think about what you've got to do to make your industry improve, you've got to do that with quality preparations. So, preparing is more important in my mind than — so it makes the act of executing something rather simple as you go forward. And you have to put in all the details and you have to own it and be responsible for yourself and be open with other people with the coaching. If you got to coach, give them positive feedback and you got to coach when things are not done right so that you're all working as a team together to improve, because it's really the people that help each other throughout the years that made Indian Point successful. A lot of different knowledge, a lot of different areas of expertise, a lot of different drives to get stuff done, but when you melted it all together, they worked well and helped each other and Indian Point be successful.

Q: Thank you Bill for your contribution to the Indian Point Heritage Project.