

RALPH NADER RADIO HOUR EP 258 TRANSCRIPT

Steve Skrovan: Welcome to the Ralph Nader Radio Hour. My name is Steve Skrovan along with my co-host David Feldman. How are you doing today, David?

David Feldman: In the words of Ralph Nader, I don't do mood swings. Keep going forward. Somebody once asked Ralph, "Do you ever get upset about what's going on?" And he said, "I don't do mood swings." And that's what Americans have to remember. Move forward.

Steve Skrovan: And I'm going to ask your ex-wife about that. And we also have the man of the hour, Ralph Nader. Hello, Ralph, who doesn't do mood swings.

Ralph Nader: Hello, everybody. Get ready for a real primer on nuclear power.

Steve Skrovan: Yes. Well let me set that topic on the table. In the debate over the climate crisis, and that's what we like to call it here, climate crisis rather than the more benign climate change. In that debate, there is a fragment of the environmental community that believes that nuclear power, since it is not a fossil fuel, is an option to reduce greenhouse gases. Even Barack Obama included it in his "all of the above" energy policy. Well to talk about that and many other things nuclear, we've invited on a true expert witness. Our guest today is Dr. Gregory Jaczko. Dr. Jaczko is the former Chairman of the Nuclear Regulatory Commission. And unlike many of the other regulators on that commission, Dr. Jaczko was a scientist--no ties to the nuclear industry. And he had an epiphany of sorts after seeing the disaster at the Fukushima Nuclear Power Plant in Japan back in 2011. He started voicing concerns about that the nuclear industry was not making the necessary changes to prevent the same kind of disaster from happening here. And lo and behold, soon Dr. Jaczko was no longer on the Nuclear Regulatory Commission. He has written a book about his experience entitled Confessions of a Rogue Nuclear Regulator. We're looking forward to that insider's view of the dangers of nuclear power that a whole new generation of people seems to need to be reminded of. And since corporate crime never sleeps, it wouldn't be the Ralph Nader Radio Hour if we didn't also take some time out to check in with our Corporate Crime Reporter Russell Mokhiber. As Ralph said, this is going to be an eye-opening interview. David?

David Feldman: Dr. Gregory Jaczko served as Chairman of the U.S. Nuclear Regulatory Commission from 2009 to 2012 and as a commissioner from 2005 to 2009. As chairman, he played the lead role in the American government's response to the Fukushima nuclear accident in Japan. Dr. Jaczko is now an adjunct professor at Princeton and Georgetown, and an entrepreneur with a clean energy development company. He is the author of Confessions of a Rogue Nuclear Regulator. Welcome to the Ralph Nader Radio Hour, Dr. Gregory Jaczko.

Dr. Gregory Jaczko: Well, thank you for inviting me. It's a real pleasure to be here to talk to all of you.

Ralph Nader: Yeah, welcome indeed, Gregory Jaczko. I'm going to call you Gregory for short, because I am an acquaintance of yours as we'll see in the following minutes. I just want to put a little background here of how I got interested in nuclear power. It was back at a visit at the Oak Ridge National Laboratory in Oak Ridge, Tennessee, full of obviously nuclear engineers and scientists who favored nuclear power. At the time, I was told that nuclear power is a way to boil water in order to produce steam to activate the turbines to produce electricity. It occurred to me it was a rather complex way to boil water. So at lunches, I would ask some innocent questions. And one question I asked was, "What's the worst that can go wrong in a nuclear power plant?" At that time in the early 1960s, there were very few nuclear power plants. And all I'd get from the physicists and engineers was they would say "the risks are vanishingly small." They liked that, and "we have defense in depth". Those were the two phrases. And when I asked about the biological effects of the release of nuclear radiation, they said "We're not biologists, but we have a lot of biologists here at Oak Ridge, ask them." It was only a few years later that the Atomic Energy Commission, the precursor to the Nuclear Regulatory Commission that you shared, was predicting by 2000 A.D., there would be 1,000 nuclear plants in the U.S., a hundred of them up and down the coast in California. And right now, Gregory, how many are there operating in the United States?

Dr. Gregory Jaczko: There's 98, give or take, one, one or two operating today. And the number's on its way down. Well, in the next couple of years, there's a few plants that are scheduled to shut down so that the number will continue to decrease. And I'm sure we'll talk about later, there were supposed to be a couple of new plants coming online, but it looks like of the four most likely plants coming online, they are only going to be two. So it's a decreasing number for sure.

Ralph Nader: All right. To continue, those are the years, as you know from history, when one of the chairmen of the Atomic Energy Commission, perhaps the first one, claimed that it would produce electricity "that would be too cheap to meter." That was a time, I remember when I was a kid, in 1946 after Hiroshima and Nagasaki, the teacher came into the class and said, "The nuclear power era is going to be spectacular. We'll have a little bit of nuclear power in every car. We'll never have to go to a gasoline station." So, in the meantime, there were some close calls. There was the Brown's Ferry Nuclear Plant that had a terrible fire in the cable-spread system in the Tennessee Valley Authority area. And there was the Fermi reactor outside Detroit, which had a close call leading one of the nuclear engineers to say "We almost lost Detroit." And then there

was the little-noticed statement by the Atomic Energy Commission. I believe that was sometime in the 1960s. It said that a class-nine meltdown of a nuclear power plant "could contaminate an area the size of Pennsylvania." So, tell us what are the risks and how much radiation could be released. Give us an overview of the hazards that the nuclear industry never likes to talk about.

Dr. Gregory Jaczko: The way I like to think about it, the biggest hazard is really long-term environmental contamination and the associated effects. And those associated effects can be

pretty significant. It could mean permanent evacuation of homes by people living around those plants. And there's lots of different estimates about what the exact extent of that contamination would be, but it's fair to say that it's significant enough to cause pretty significant impacts to any community. And of course, we have examples of that. We saw what happened in Japan when the Fukushima reactors went through a very, very major accident and of course, in Chernobyl we saw that. And it shows that you can have really significant impacts. I mean, Chernobyl, many people died responding to it. In Fukushima, you have people who--over 100,000 people who had to leave their homes and many of them can never go back, so that entire community is destroyed.

Ralph Nader: Well you have an inside account on the whole Fukushima disaster, which involves six plants, four of them shoulder-to-shoulder to one another by the ocean and two a football field apart and we'll get to that. But I want to let you in on a conversation I had with the director of the Oak Ridge National Laboratory, a famous physicist who is Alvin Weinberg. And he not only was a promoter of nuclear power, but he knew of the risks. And he told me that he would like a nuclear priesthood, that is the best of the best scientists, to oversee nuclear power plants located in clusters. They wouldn't be spread around; they'd be located in clusters of four or six plants so that the nuclear priesthood of excellence could manage them. And in our conversation, he told me something quite remarkable, Gregory. Here's a promoter of nuclear power. He said "When solar energy ever gets down to where it's only two and a half times more expensive than nuclear power, I'll shift and support solar energy." Isn't that fascinating? Of course, no. It's much cheaper.

Dr. Gregory Jaczko: Yeah, I mean, that is fascinating. And as you said, now it is cheaper, so it's kind of flip that; it's the other way now. Nuclear is more than two and a half times as expensive as solar, and yet there are still a lot of people who think that it's the right answer and so, you know, that is kind of funny to hear that and that thought. And it's exactly right; in many ways, it's what the rest of the world is recognizing right now.

Ralph Nader: Well in your fine book, which is a terrific read, listeners. It's less than 200 pages and the pages are not that large, but it's full of information. You go through your experience. First you were in Congressman Markey's office overseeing the Nuclear Regulatory Commission and the industry, and then you went over to Senator Harry Reid's office, and then you went/became a commissioner for several years of the Nuclear Regulatory Commission, then you become chairman. And you had to confront a very powerful, private nuclear power industry that basically was government guaranteed in all kinds of ways. Can you explain that?

Dr. Gregory Jaczko: Yeah, well, you know, one of the aspects of the nuclear power industry that people don't really know is that if there is an accident, well, and really when there's an accident, the costs and the damages from that accident are in a way protected by the Federal Government. And all the power plants are indemnified so they are protected against liability and required to pay a certain amount of money. But if the costs of an accident are more than that, they don't have to pay for it. And at that time, the taxpayers will pay for it or somebody would

pay for it, but not the companies that created the problems. But more importantly and more subtly, you have this regulatory agency, the Nuclear Regulatory Commission, where I worked, that is responsible for regulating the industry. But because of the influence of the industry, the influence of politics, the leaders of that agency, the commissioners if you will, seem to have more of an interest in preserving and protecting the industry than they do on just focusing on nuclear safety. And I think that is, of anything, the really worst kind of implicit protection that the government gives to this industry.

Ralph Nader: Well, there's actually one that's even more outrageous and you know all about it, the plants in Florida that they wanted to build in the last few years and in Georgia, and they got through the legislature. This is really outrageous consumers, as ratepayers, you know, you pay your monthly electric bills. It's called construction work in progress. You want to explain this type of corporate socialism rammed through an indentured Florida legislature and Georgia legislature?

Dr. Gregory Jaczko: Yeah, and also, Ralph, also the South Carolina legislature which is probably right now the most significant because they started to build the plant there and then they canceled it. But the way that this worked is that, well kind of in the old days, if you will, when they used to build nuclear power plants or any kind of big power plant, the power companies would have to go out; they'd raise the money, they'd build the plant. And when they started operating it, they would charge their customers, the ratepayers, a certain surcharge to cover the cost of building that plant. Well, you know all these companies realized that nuclear power plants are extremely expensive. And trying to go on and borrow all that money would be very hard and so one thing they did is they asked the federal government to back their loans and the financing and the federal government agreed to do that. But then they also made their ratepayers pay for this. They didn't ask them; they went to their public utility commissions who are also supposed to be working in the interest of their ratepayers and they said, "Look, why don't you let us start charging people now while we build the plant so we won't have to borrow as much money from the banks?" But what they're doing is they were borrowing and they are borrowing from their customers. And it's essentially an interest-free loan that they get from all the people that they're supposed to be selling electricity for.

Ralph Nader: Yeah, in other words, the ratepayer, the consumers in the homes all over those states were required to pay for electricity they never got.

Dr. Gregory Jaczko: Exactly.

Ralph Nader: And in fact, because the plant is just a hole in the ground and they start paying for electricity, so they're forcing consumers to be bankers with no interest rates.

Dr. Gregory Jaczko: Exactly. It's a banking business no banker would ever go into because they're loaning money for free and so I mean it's a great deal if you're a utility and you can do that. And the arguments they tried to make were well, at the end of the day, we're going to pass

on the costs of the interest that we have to pay to bankers. We would pass those costs on to the customers anyway, so this way they won't have to pay those interest charges and so in the long run, it will be a better deal. But that's not really the way finance works and it's not the way that consumers necessarily wanted to spend their money is on building a nuclear power plant that in fact might never get built. And that's exactly what happened in South Carolina after spending about 10 billion dollars, \$10 billion--just think about that number--they canceled the project. And all the legislators in that state who supported this deal now are up in arms saying, "Well how could this happen? How could you take all this money from (now they're not thinking of them as ratepayers but as voters) our voters, and what are we going to do to make them whole?" And the power companies were saying, "Well, that was the deal. You knew the possibility that this could go bad and they would still have to pay for it, so we're entitled to recoup that money." And they're fighting right now to try and figure out how to resolve that. But at the end of the day, consumers are going to pay billions of dollars for nothing, for not a single electron of electricity.

Ralph Nader: Or they go to Congress and make the taxpayers pay.

Dr. Gregory Jaczko: Right.

Ralph Nader: But they've dropped the nuclear plants they were building in Florida. They've abandoned those. And they're still trying to push it in Georgia?

Dr. Gregory Jaczko: Yeah, they are and that's an even more amazing story. So the South Carolina has been dropped and they had plans to build some in Florida, but they dropped those before they even started doing any construction. But while all this is going on, there were also plants in Georgia and right now, those plants are also way behind schedule and way over budget. And right now, these estimates are climbing. It's almost like they go up every day. Every time you say them, they seem to go up. But right now, they're estimating about 28 billion dollars for two nuclear power plants in the State of Georgia. And that's more than double what they initially promised these reactors would cost. And you go back to that idea of solar being two and a half times nuclear, being a better deal, well at that kind of price, that's almost 10 times more than solar. It's so expensive.

Ralph Nader: And when you say to these electric utilities, why is it taking so long? You start out saying it's going to take 8,10 years; it takes 14 years. You start out saying it's going to take \$5 billion, for 1,000 megawatt reactor or whatever, and it ends up taking double or more. They blame the Federal Government's regulatory overreach. Can you, as a former Chairman of the Nuclear Regulatory Agency--we're talking with Gregory Jaczko, a PhD in Physics--can you respond to that?

Dr. Gregory Jaczko: Yeah, the Nuclear Regulatory Commission is the favorite blame for these problems. And I could tell you, the NRC is not responsible for that cost overrun of those delays. It's a function of just the administrative and management challenge of building such a complex machine. And these machines are so complex, getting back in your initial conversation, because

you have this potential for very, very significant releases of radiation. So, you have to build and design all of these systems into these plants; in addition to just the normal systems you need to manage this electricity or this energy that comes out of the nuclear fission process. And you need all these systems and they're expensive, and they're complicated, and the plants are complex, and that leads to a very, very difficult challenge. But what's more important than anything else is, if you go back to 2012, and I happen to be chairman when we licensed these reactors, and you look at what the companies that were building these plants said, they said "Unequivocally, we will build these plants on time and on budget." And I made sure from a resource perspective, from an administrative and a management perspective, that the agency would be in a position to meet whatever we needed to do to inspect it, to review it, so that they couldn't turn around and say it was the NRC's fault. And today, one plant has been canceled because of these massive cost overruns and the other plant is continuing, but at an exorbitant price tag.

Ralph Nader: Tell us this. When this book came out just a few days ago, *Confessions of a Rogue Nuclear Regulator*, by Gregory B. Jaczko, it hit the industry like a thunderbolt. They tried to discredit you when you were in the government--that you were too outspoken, you were too bold when you were just trying to save maybe an area of Pennsylvania from getting radioactively contaminated--that's all, just that, very modest. What kind of reception, a) did you get from the nuclear industry and their allies in Congress if any? They usually respond with silence. And b) have you gotten on NPR/PBS or any of the commercial TV and radio networks?

Dr. Gregory Jaczko: You know, I haven't heard anything from the nuclear proponents in Congress really or anyone in the industry directly. I suspect I won't ever hear from them directly. And I have been fortunate; there've been a lot of people who've been interested in hearing the story. I was on an NPR show and was able to get on some network TV and I've had a chance to talk about the message. And I think generally people are surprised to hear a lot of what I have to say because it's not the kind of information you hear routinely. I'll tell you a little story. I made it a point because of the important influence that Wall Street and investment bankers had on the industry and the future of nuclear power certainly when I was chairman. So, I would make a point of visiting them once a year and telling them what I thought was really going on with the industry, and what was the future of the industry, and what the challenges were. And I ran into one of those people after I left the agency and they said to me, "You know we don't hear anything about what's going on at the Nuclear Regulatory Commission anymore." And I said well, that's the way the industry likes it. They don't want the agency to be talking too much because it's not something that they want talked about. What are the challenges, what are the risks, what are the hazards, and so silence is really, I think, the way the industry prefers for these kinds of things to happen.

Ralph Nader: Yeah, the auto industry has gotten around to that, too. They don't like to rebut the exposés of their motor vehicle defects. And partly, as you point out in your book, there's a whole generation of Americans that doesn't know much about nuclear power because the last highly publicized near disaster was Three Mile Island in central Pennsylvania near Harrisburg in

the late 1970s. I think it was March 1979, which scared the heck out of the country and the press gave it a lot of coverage. But other than low-level radiation leaks, occasional spills, and corrosion problems, aging problems, and plants like in Florida and near Chicago, there hasn't been much publicity about all this apart from, of course, Fukushima. Before we get into your trip to Fukushima and the horrendous low probability/high disaster situation that that was, I mean where you had an earthquake, a hundred miles off Japan, and you had a tsunami. And how a huge wave of water just demolished most of those six plants, which are still closed and Tokyo was only 150 miles away. I mean this is beyond a disaster-film dimension. We met in the 92nd Street Y in New York City after Fukushima. I was there, you were there, the former prime minister of Japan, who was a prime minister when Fukushima occurred and began a tour of the world urging opposition to all nuclear power, Prime Minister Naoto Kan was there. I think Peter Bradford, the former NRC Commissioner, former head of a New York state utility commission was there. And we warned people about Indian Point. Now Indian Point, there are two nuclear reactors just 30 miles north of mid-Manhattan. Can you imagine? Just 30 miles north, they're aging plants. Both Hillary Clinton and Andrew Cuomo years ago demanded that they be shut down because of various safety factors. Can you explain the enormous risk that these plants pose and I guess they're scheduled now to be shut down? And listeners, just think of this news conference that was completely blacked out by the press. Go ahead, Gregory.

Dr. Gregory Jaczko: Yes, so there's lots of different strategies for dealing with nuclear power plant accidents and that's really the key here. But a big basis for that is the idea that we would prepare people to leave their homes, to evacuate, so they wouldn't get exposed to radiation. And when you think about a nuclear power plant that is maybe out in a rural area in Nebraska or something like that, that seems like an easier proposition. Maybe we've got 10,000 people who live 9 miles away from the plant and you can move those people easier. But when you're talking about a plant like India Point, which is 30 miles from downtown Manhattan, but of course between downtown Manhattan and the plant itself, there's a lot of people; it's a very, very difficult plant to ever really have an evacuation for. You just simply couldn't move the people in the time that you would need to move them. And that's one of the really biggest concerns, I mean, because of course in principle with the nuclear accident, if you move people away, they're not going to get exposed to radiation. They probably can never go back to their homes, but at least they could be protected. But when you talk about this kind of dense urban environment around these plants, then it's a very, very different proposition. And going back to what happened at Fukushima, I happened to go visit one of the communities that was impacted by the accident, talked to the mayor and he told me how chaotic the evacuation was and that they actually had them move to an evacuation center that was really in the heart of one of the high radiation areas. So, these things are challenging and when you have the population density, the narrow roads, and limited access that you have around that plant in upstate New York or just north of the city actually, it's very, very challenging to try and effectuate any kind of appropriate emergency response when these kinds of accidents happen. And so rightfully I think, the governor pushed and Senator Clinton pushed and many other elected officials pushed for that plant to be shut down and it's scheduled now to shut down in the next year and there's two reactors there and they'll shut down I think in 2020 and 2021.

Ralph Nader: Isn't there an earthquake risk too?

Dr. Gregory Jaczko: There's an earthquake risk for lots of plants. It definitely is a plant that has an earthquake risk and surprisingly it's not necessarily the largest earthquakes that we have on the West Coast of California, but it is a plant that there are potential earthquakes that could impact the plant in that part of the country. And it's actually surprising where some of the highest earthquake risks are. In fact, actually the Midwest has some of the highest earthquake risks in the whole country. And we're familiar, of course, with the earthquakes on the West Coast but you also have some challenging earthquakes in the Midwest and other parts. And I was reminded of that, and it's one of the stories I talk about in the book, when one day I was at the Nuclear Regulatory Commission in one of our conference rooms, and it was on the top floor of our building, which is a 19-story building and the room just started swaying in a way that I had never felt before. And I thought what exactly was that? It turned out there had been an earthquake very close to a power plant in Virginia. And that power plant--the earthquake was actually more severe than that plant was really designed for just by a little bit--and the plant turned out to do pretty well, but some of the spent fuel that was stored there was actually shifted around a little bit in kind of a surprising event. So these earthquakes can happen in lots of different places and impact all plants in the U.S. almost.

Ralph Nader: But David Freeman, whom you know, is the former head of the Tennessee Valley Authority, engineer and a lawyer; he was big proponent of nuclear power and he graciously credited me with changing his mind. And he went out to the utility in Sacramento and he shut down the nuclear plant there and replaced it with energy efficiency and renewable. And then he went to the Los Angeles area, ran a utility there, then he was in upstate New York. And the remarkable thing about his experience is that the Atomic Energy Commission predicted 100 plants in California by the year 2000. Tell us how many plants there are today.

Dr. Gregory Jaczko: Well today there are two operating reactors in California and those are scheduled to shut down in 2024 and 2025. So in a couple of years there won't be any in California. There were another three reactors that were built too that were recently operating in southern California and they had to shut down because of a major equipment failure that had a minor release of radiation and could have been a much more significant incident. So right now, the future is they're heading towards zero. I find it interesting because there's so many people right now talking about climate change, which is a very significant issue, and probably one of the most significant environmental issues we face. And there's a lot of people running around talking about how nuclear is the only way we're going to solve climate change. And it just reminds me, back to these predictions back in the '60s, of how we were going to have an entire country powered by nuclear power then. And it's like a generation has forgotten those promises and now they're latching on to nuclear as some kind of solution to climate change, and that to me, is a real mistake.

Ralph Nader: Well we're going to get to that because the last rationalization that the nuke lobby has is the climate crisis, the climate disruption. We're going to get right to that. But let's go to Fukushima. Japan was a modern, highly technological, highly disciplined society. It wasn't a Third World country with a nuclear plant. And when you were asked, after Fukushima, why did they build plants where they built them? And you said part of the answer is that the nuclear industry simply insists that severe accidents are not possible. And that's true all over the world. They just say we have so many defenses in-depth, so many safeguards, so many follow-ups in case something fails, it can't happen. So let's describe what happened at Fukushima.

Dr. Gregory Jaczko: Yeah, so Fukushima started when there was an earthquake off the coast as you mentioned, a very, very large earthquake. And that earthquake took out a key system at the nuclear power plant and that's what we refer to as the offsite power. So it's a little known fact about nuclear power plants that they actually need electricity from outside the reactor to power their safety systems in the event of an emergency or when the plant has to shut down. So they depend on electricity. Well when that earthquake happened, it knocked down transmission lines and that external source of power. So, in that situation, the plants are designed--this is part of this defense in depth or backup systems. They're designed to have their own internal power generation systems, so basically big diesel engines that can turn on and supply electricity to all the systems that are needed to keep the plant safe after it shuts down. Well, right after that earthquake, there was a huge, I mean, a huge wall of water. There's no other way to describe it than that, about 50 feet high, that slammed into that reactor site. And in so doing, it took out essentially the ability of those diesel generators to supply electricity, so you had a reactor that is now completely without electrical power. And that means a meltdown or an accident of severe scenario because there's no way to remove all the energy and heat that's been built up from generating the electricity. And so that heat and that energy starts to break down the plant. And when it starts to do that, it produces a tremendous amount of radiation that eventually gets out into the environment. Now these plants are all surrounded by what they call containment structures, which are designed to keep that radiation inside the plant, but all of those containment structures have a failure point and that failure point will be reached any time you've got this kind of significant situation where you lose all the power. And that's what happened. So over the course of really the next weeks and months, this plant was just spewing radiation into the air and into the water.

Ralph Nader: And into the ocean and into the fisheries.

Dr. Gregory Jaczko: Into the ocean. Exactly.

Ralph Nader: Describe now the state of the nuclear power industry in Japan. They had about 50-some plants and what's the situation? How many are closed, how many are open?

Dr. Gregory Jaczko: Yeah, so they 54 plants operating at the time of the accident and six of those are permanently shut down--the six that were at the reactor site where the accident happened. And then over time after the accident, all of their plants shut down because, of

course, people were very concerned in Japan about what the impact of this accident meant and how safe the rest of the plants were. And so the industry really, one by one, just turned off the plants. Over the years, they've tried to get some of those reactors started and they have--it's less than 10 reactors right now; I think it's eight or nine that they have operating today, which is a far cry from the 50-some that they had before. Now they're trying really hard to get more reactors started, but there's so much concern in Japan now and this is a country that's not necessarily thought of as a country where people protest the government and they demand changes to government policy in a way that we think of as kind of a part of our country and our history. But you have these massive protests and people all over Japan concerned about these nuclear power plant restarts and they've been fighting them and they've been very successful in fighting the restarts, so it's unclear how many more plants will really be able to start. And that's been almost an unintentional experiment because there are a lot of people who would have said before that accident that if you shut down all of Japan's nuclear power plants or most of their nuclear reactors, there's no way that you'd be able to deal with climate change and Japan would have rising carbon emissions. And right now, the story is actually a pretty good one. They are actually now producing less carbon emissions from their electricity sector than they did before the accident. And they only have, at most, a fifth of the reactors operating that they had before. So it shows that you can meet climate objectives without relying on a nuclear power program.

Ralph Nader: And the Japanese are very sensitive that they know what radiation was released on Hiroshima and Nagasaki bombs. Compare the amount of radiation in a 1200 megawatt nuclear plant with the fallout from the Hiroshima bomb.

Dr. Gregory Jaczko: Yeah, it's a large amount of radiation. I forget the exact comparison. It's a little bit different mixture of different . . . there's all kinds of different types of material but it's a significant, certainly significant release of radiation. And there are parts around that plant that basically will never be habitable again in anybody's lifetime who lived in that community. And that's just something that is, in my mind, just completely unacceptable. We're talking about this wasn't a weapon. It wasn't a bomb that went off there. It was a power plant and there's just no way in my mind that it should be okay that power plants are producing this kind of destruction. And a lot of people will point to coal plants and say that coal plants are harmful because they produce air pollutants and that's exactly right. And with coal plants, we recognize this is not a way we should be generating electricity but yet for some reason, people are able to dismiss it when it happens with the nuclear power plant. But it's something that's simply, in my mind, unacceptable. You should not be building power plants that can cause contamination to an area around the plant that requires it to be evacuated for decades or more and an accident that can cause the economy to suffer and move into retract.

Ralph Nader: Which gets us right back to the United States, to Fort Calhoun Nuclear Plant near Omaha. And before you just get into that, because the impact of Fukushima on the U.S. was quite different and complacent compared to the impact of the Fukushima disaster on Germany. How to Germany react?

Dr. Gregory Jaczko: Yes, so Germany made a decision after the accident that they were going to move away from nuclear power, which had been a very strong element of the government prior to that and they decided, and again, this was by Angela Merkel who made that decision who was a physicist by training, I believe, and well-versed in all of these issues and understands the technology, and she decided that it was not a risk that Germany as a country could accept. And so, they decided to phase out the program and they've eliminated their nuclear power and are turning to renewables as the solution for their future electricity needs. Now it's been a challenging road because it happened so quickly and they maybe didn't have as much time as they needed to really ramp up that industry so they're doing that. But the progress is good and the future looks really good for them as they begin to transition to really a new thinking and a new way about electricity.

Ralph Nader: But, you know, in the U.S., the nuclear industry is like a serial tone-deaf industry, because right after Fukushima, there were huge floods in the Missouri River by the Calhoun plant. Describe that near-disaster just a few months after Fukushima, right?

Dr. Gregory Jaczko: Yeah, a few months after Fukushima, I found myself in Nebraska looking at, again, one of the most amazing physical sites I'd ever seen and it was this nuclear power plant basically surrounded by the Missouri River. The Missouri River was flooding at near record levels or maybe even at record levels at the time and all of that water had crept up around the plant and was completely surrounding the reactor at the time that I went to visit it. And we knew from safety studies that there was a limit, that at a certain point if the waters got too high, that that plant was most likely headed for an accident, maybe not as severe as in Fukushima, but an accident nonetheless. And thankfully the waters didn't get that high, but it was something I was getting reports every day about what the water levels were around the plant, because we knew that there was a level at which it would be too high. And you don't think that these things can ultimately happen, but in fact they did. And the causes of that rising water, they're not something you were necessarily thinking about, because it all comes back to snowfall in Wyoming and Montana. And it's all of that snow, as that snow melts, feeds this massive system of rivers that take that water from the upper northwest and bring it all the way down into the Midwest and ultimately down into the Gulf of Mexico. Thinking about that and planning for it is almost incomprehensible because it's so far outside the scope of this local power plant in Nebraska.

Ralph Nader: It was never part of the maximum scenario of disaster by the NRC, right?

Dr. Gregory Jaczko: Yeah, all plants had to look at flooding and this is one of the challenges that we found after the Fukushima accident was that maybe the maximum flooding weren't sufficient. And unfortunately, while we put in place some really good ideas about how to fix that and how to go about reexamining those flooding scenarios for all plants. And actually, just about a week ago, the Commission rejected doing anything about that and said you know what, we've done enough. We don't really need to look at these issues, kind of going back to this idea that accidents just aren't going to happen here. And to me it's completely the wrong approach to dealing with nuclear power.

Ralph Nader: Listeners might be asking what percent of U.S. electricity consumption comes nuclear, still about 20% or so?

Dr. Gregory Jaczko: It's still about 20% and it's going down a little bit as plants close. And again, there's really not much on the horizon to make that go up again, so...

Ralph Nader: Let's get to the major argument the nuclear plant industry is left with. We have to have nuclear plants because fossil fuels create greenhouse gases and we get climate disruption. So, for climate change, we have to do it. Now otherwise sensible people are writing articles and books arguing that. There was a recent book in the New York Times "Book Review" reviewed by pro-nuke Richard Rhodes who made that argument. Can you educate our listeners about this?

Dr. Gregory Jaczko: I mean the simple answer is, it's kind of a show-me moment, I mean, show me the plants that are going to do that. In the United States right now, we have 98 or so plants operating; that's scheduled to decrease over the next couple of years and will likely decrease more and more as these plants get older. And there were supposed to be at least four new reactors built. Two of those plants have already been canceled and the other two are costing an exorbitant amount of money. So from a simple practical standpoint, there's no way within a reasonable cost to build nuclear power plants from a financial perspective, from a management perspective, from an engineering perspective.

Ralph Nader: From a time-perspective.

Dr. Gregory Jaczko: Right. And from a time-perspective.

Ralph Nader: It takes so long to build.

Dr. Gregory Jaczko: Exactly. It takes so long to license and to build that you just can't do it. So, the good news is that there are actually things you can build that are in fact cheaper than new nuclear that don't produce carbon--solar, wind power, geo thermal. And the battery stores that you need to make sure that you have that power at the times when you need it, is also getting to the point where it's now economically cheaper than nuclear power.

Ralph Nader: And this leads me . . . there's one gap in your book that I thought was unfortunate. You didn't emphasize enough energy conservation or efficiency, because we waste more energy than any country in the world, perhaps apart from Canada, which matches us. And one scientist once said that to me, "Do you know what the major purpose of an electrical-generating plant is in America?" And I said what? He said, "to heat the heavens; that's how much waste there is."

Dr. Gregory Jaczko: Yeah.

Ralph Nader: And so, one of the answers to the nukes on climate change is: burn less fossil fuels, more retrofitting of buildings, more efficient refrigeration, air conditioning, heating, engines, furnaces, etcetera. And I wish you had done a little bit more about that because that to me is the immediate. I mean you can get energy efficiency much quicker than you can building a 15-year overpriced, dangerous nuclear plant.

Dr. Gregory Jaczko: Yeah, and Ralph, and I know and I'm guilty of I always leave energy efficiency out and I should know better because, in fact, that's what Japan did. I mean, of course, when all their nuclear reactors went out, they did not have an aggressive renewable program because they had hinged so much of their climate strategy on nuclear power that they never really developed renewables there. And so when the accident happened and they were forced to shut down all of their reactors across the entire country, they had to turn to two sources of energy. They turned to energy efficiency and then unfortunately, they had to turn to polluting fossil fuels because that's all that was available. But energy efficiency did a tremendous amount and they never had blackouts; they didn't have major brownouts or power disruptions because they were able to really implement, as you said, overnight, a massive energy efficiency program that helped them get through this until they could do things like get their renewables up and running more quickly. And so that has been a key component of what they have done to cope with the situation. And it's really demonstrated how quickly you can turn on kind of that virtual power plant that you get from energy efficiency.

Ralph Nader: And, as Amory Lovins pointed out, we have improved energy efficiency since Three Mile Island significantly, but nowhere near what the potential is. And the other thing you didn't mention enough is the role of these great local citizen groups that actually stopped the building of some nuclear power or made them improve their safeguards, like the two in Washington, which you know very well, NIRS and Beyond Nuclear. They really deserve some heroic approbation wouldn't you say that?

Dr. Gregory Jaczko: Oh, I mean absolutely. I've heard from many of my friends in those groups and other groups that I should have talked about them more in the book and so they've let me know. But it's true. I mean there are some really amazing people out there talking about these issues and they're making good arguments and good points. And when I was chairman, one of the things I really tried to do was to bring them in the conversation more, because I thought that they added so much and they forced us to think about things that we weren't thinking about and which the industry didn't want us to think about! And when I look back at the amount of resources that the industry has and really the pervasive influence that it had within the agency, it's really telling that some of these organizations, which operate with only a few people, that they're able to make any impact at all; it's just a testament to their integrity, to their effort, and to their knowledge. And it really made a huge difference when they were present, when they were engaging us and helping us do our job better. And I did everything I could to try and get them to be more a part of the agency. And of course, that was something that I got some pushback from within the agency. But I worked through it and realize that that was an

important part of us being the best regulator we could be, was to really hear from everybody who had insight and knowledge about what was going on in nuclear power.

Ralph Nader: Exactly. Because it's a very authoritarian industry surrounded by secrecy by the corporate state, by very close relations with the government and you helped open up the NRC to these democratic initiatives. Before we get to Steve Skrovan who has a question, I'll betcha our listeners are now saying, what is Gregory Jaczko's position now? He's written this book highly critical, very deeply documented in science and experience on nuclear power plants. Would he urge them to be shut down as fast as possible now? Would he expect them to dwindle as they age and don't get re-licensed? How about the imminent danger here, what's your position?

Dr. Gregory Jaczko: Yeah, I think the most practical path forward is to let the plants phase out and I think really expose them to competitive electricity markets. And I think when you expose them to competitive electricity markets then they recognize that they can't compete and they're going to shut down and I think that's the best approach going forward. What I've really found unfortunate is a lot of states, and we talked about what's going on with some of the new reactors, but what's happening in a lot of states is a lot of states are buying into this message that to deal with climate change, they need to subsidize these nuclear power plants. Because if the plants shut down then they'll be turning to fossil fuels and all these other things that aren't good for climate, but I don't think that's right. I think those are wasted dollars. So, in my mind, you let the plants compete fairly economically and I think if you do that, we know the cheapest sources of electricity right now is wind. And allow the wind facilities to be built and you can get rid of that electricity and you replace it with carbon-free electricity and begin or continue really this energy transformation that's happening all over the country.

Ralph Nader: They do. Even in Texas is a big wind producer as well as other parts of the world is beating nuclear power economics again and again. There's always passive solar architecture too, my architecture friends keep reminding me. Before we get to the summary, I've got eight "uns" and I want to summarize everything with eight "uns" about nuclear power. Steve, what's your question?

Steve Skrovan: I actually have a couple of questions if you'll indulge me.

Ralph Nader: Sure.

Steve Skrovan: My first question is just straight out. Do you believe that we are at risk of having an accident here in the United States on the scale of a Chernobyl or Fukushima?

Dr. Gregory Jaczko: I think on the scale of Fukushima, yes. I mean every nuclear power plant in this country operates on this balance between, or really this ridge almost like a precipice of safe and normal operation and catastrophic accident. And it's just a feature of the plant. And I think quite frankly, I think the industry or maybe not the industry, but policymakers would just be

better off acknowledging that and saying yes, that is a reality. We can't predict exactly where because nobody can really predict exactly how all of these systems are going to fail. So, we have to accept that it's going to happen and it's just a question of when and where and what exactly the consequences will be. Will they get as severe as Fukushima or will it be like a Three Mile Island event where you cause a lot of panic and concern, but the radiation releases aren't that large, but you wind up destroying the reactor, which in today's dollars could be a \$10 billion or more asset. So, it's unclear exactly what the consequences will be and when it will happen and where it will happen. But, yes, it's certainly possible for all the reactors that operate in the U.S. today.

Steve Skrovan: My next question is that this involves the NRC. And you always hear people say, they talk about background levels of radiation and how, you know, you eat a banana or you go on an airplane, you get just as much radiation as you would get from what they vent out of a nuclear power plant or what an accident would be. But it's come to my attention that the level of radiation that is considered normal background has been raised several times--most recently almost doubled. So why did they do this? Is this valid scientifically to be moving the target of what's acceptable on the human body?

Dr. Gregory Jaczko: Well you know the radiation—what are considered the public radiation limits for safety really for the Nuclear Regulatory Commission—those haven't changed too much as I'm aware. I mean there are some people who want to change some aspects of how you deal with radiation and what those safe levels are. I think mostly that's not really grounded in kind of a generally accepted science. But what's interesting--and certainly there's radiation around us at all times and it's a fact of life--it's a fact of where you live. And some places have higher radiation levels than other. One of the interesting talking points that you often hear about is that you can get more radiation from flying in an airplane than from being around a power plant. But, of course that's during normal routine operation and it's designed to be low so that people are safe. Of course, during an accident, those levels go up if you release radiation. But what is interesting is we're also starting to see now, there was a study that came out recently demonstrating that airplane workers, or flight attendants primarily, are seeing higher incidence of cancer and that's most likely attributed to their radiation, their elevated radiation exposure that you get when you're flying in the atmosphere. So, most of the data is confirming more and more the general relationship between radiation. And generally, what that says is, that there's always a risk of some type of disease, mostly cancers, even for the lowest amounts of radiation. Of course, the lower amounts of radiation give you a lower likelihood of disease, but we still--most of the data seems to show that that's in fact the case. So, NRC tries to set a standard that is somewhat conservative without saying it's zero and, again, that's something people could debate, whether that's the right thing or not, but it is definitely a feature and a factor in looking at the safety of the reactors.

Steve Skrovan: Isn't there a thing called the linear no-threshold principle that says any amount of radiation is harmful to humans?

Dr. Gregory Jaczko: Yeah, exactly. That's this idea that there's a one to one relationship between essentially the size of the radiation exposure and the impact on your body. So as you get to lower and lower radiation levels, the impact is lower. But it's still believed that essentially as you go all the way down to zero that there is some increased risk of cancers. Now when you get to these really low levels that risk is pretty low. It's probably no bigger than the risk of having a hamburger once a year or something like that in terms of how that could impact your health. So, you get to a situation where it's just hard to correlate a particular disease to this radiation exposure, because there's so many different causes for cancer--knowing exactly whether they came from radiation exposure or from a genetic predisposition or some other environmental exposure that you had. It's just it's so hard at the lower levels to be able to directly correlate it. When you get to higher radiation levels then it's much clearer on what directly you get and how your risk of cancers or other diseases is affected. So there is a petition in front of the Nuclear Regulatory Commission right now to rethink that. And as I said, most of that is, in my mind, based on not credible science and really not credible regulatory policy, it's nothing else.

Ralph Nader: By the way, Steve, one near disaster we didn't mention was a Davis-Besse Nuclear Plant near Toledo, Ohio, which was a fraction of a centimeter from disaster, right?

Dr. Gregory Jaczko: Yeah, that was a plant that is like a classic example of how the industry influences the Nuclear Regulatory Commission. because there was a known safety issue that this plant was potentially susceptible to and it was supposed to shut down and make repairs and address the issue. And the plant kept pushing the NRC and the NRC granted them additional time before they finally looked into the reactor. And when they finally looked into the reactor, there was a major piece of equipment that had corroded to the point that had there been any kind of abnormal scenario, that plant would have had a very significant radiation release. And had it operated too much longer, it would have had a release of radiation as well. So, it was a really, really close call and one that was a wakeup call really that, again, to this reminder that accidents will happen. We cannot assume that they won't happen and that they're just the fanciful realm of modelers and risk analysts who can dream up all kinds of scenarios for bad things happening. Accidents will happen. It's a fact of this industry.

Ralph Nader: Well here are the eight "uns" and see if you disagree with any of them that we could elaborate each one. Nuclear power is uneconomic. And this is without even mentioning the horrendous 200,000-year cost of storing deadly radioactive waste. Nuclear power is unnecessary, conservation, alternative, renewables can more than take its place. Nuclear power is uninsurable by the private insurance industry. The Price-Anderson Act makes the taxpayer take the hook for most of it in a disaster. Nuclear power plants are unbuildable without government guarantees of Wall Street loans--namely you, the taxpayer. Nuclear power is unsecure. The spent fuel rods around every nuclear power plant are deadly targets for sabotage or attacks. Nuclear power plants are unevacuatable. You can hardly evacuate New York City rush hour time, never mind around Indian Point, 10, 20, 30 miles. Nuclear power is undemocratic. The procedures exclude public participation. You point that out very well in your

book. And the summary, nuclear power is impermissibly unsafe for the American people and the habitability of its land and water. You disagree with any of that?

Dr. Gregory Jaczko: No. I would phrase some of them differently, but no, I don't. I mean I think that the last one that's the conclusion you get to, and I think it's a fair argument to say that if we didn't have options and alternatives to deal with climate change that I think we would have to confront that last question or that last one if you will in a different way. I mean I think we would have to really grapple with that hard choice of which is the greater risk--the risk of a nuclear power plant accident or the risk of catastrophic climate change. But the good news is we don't have to because of all the other factors you mentioned, there are better technologies. There are alternatives that are cheaper that are able to be deployed, that don't have any risk of catastrophic accident. And so I think we're in a good place right now. We're lucky that the work that people have done to make renewables affordable, the good policies that people have put in place--the production tax credit that stimulated the wind industry to the point where it's now the cheapest form of electricity in the country.

Ralph Nader: Yes. Then the solar panel industry creating jobs all over the country in residential areas.

Dr. Gregory Jaczko: Yeah.

Ralph Nader: Well, we've been talking with Gregory Jaczko, the author of a great book just out, *Confessions of a Rogue Nuclear Regulator*. He's the former Chairman of the U.S. Nuclear Regulatory Commission. And Gregory, I see your present role also to keep the heat on the NRC and toughen those safety standards, toughen the inspections by inspectors--earlier alert, so in the meantime, while we phase out nuclear power, there aren't any more disasters.

Dr. Gregory Jaczko: Well I appreciate that. I do my best to stay on top of it and comment where I can. And this book was one way for me to do that and to let people know what happens and how the agency really operates. And hopefully that's something that people will learn something from and enjoy reading about.

Ralph Nader: Indeed. And if Donald Trump read, we could hope that he would denounce this book so more people will hear about it.

Dr. Gregory Jaczko: Right.

Ralph Nader: In the meantime, may you get more media exposure. And thank you for being a public interest physicist and a patriot.

Dr. Gregory Jaczko: Well thank you so much and I really enjoyed the conversation.

Ralph Nader: You're welcome.

Steve Skrovan: We've been speaking with Dr. Gregory Jaczko whose book is entitled Confessions of a Rogue Nuclear Regulator. We will link to that at ralphnaderradiohour.com. Now let's take one quick minute to check in with our Corporate Crime Reporter Russell Mokhiber. Take it away, Russell.

Russell Mokhiber: From the National Press Building in Washington, D.C., this is your Corporate Crime Reporter "Morning Minute" for Friday, February 15, 2019. I'm Russell Mokhiber. A. Ernest Fitzgerald, America's most famous whistleblower, has died at the age of 92. In 1968, Fitzgerald, a top financial manager for the Air Force, revealed a \$2.3 billion cost overrun in the Air Force's Lockheed C-5 aircraft program. He did it before Congress and in defiance of his superiors. Under oath, Fitzgerald said the C-5A was \$2 billion over budget. In testifying, Fitzgerald later said he was "merely committing truth". The revelation about the vast cost overruns made national headlines, stunning members of Congress as well as Mr. Fitzgerald's superiors. As a result of his testimony, he was stripped of his duties as an overseer and shunted to trivial projects including a trip to Thailand, where he was to study cost overruns on a bowling alley. For the Corporate Crime Reporter, I'm Russell Mokhiber.

Steve Skrovan: Thank you, Russell. Well that's our show. I want to thank our guest again, Dr. Gregory Jaczko. For those of you listening on the radio, we're going to check out now. For you podcast listeners, stay tuned for some bonus material we call the "Wrap Up". A transcript of the show will appear on the Ralph Nader Radio Hour website soon after the episode is posted.

David Feldman: For Ralph Nader's weekly column, it's free. Go to nader.org. For more from Russell Mokhiber, go to corporatecrimereporter.com.

Steve Skrovan: And Ralph has got two new books out, the fable, How the Rats Re-Formed the Congress. To acquire a copy of that, go to ratsreformcongress.org. And also, To the Ramparts: How Bush and Obama Paved the Way for the Trump Presidency and Why It Isn't Too Late to Reverse Course. We will link to that also.

David Feldman: Join us next week on the Ralph Nader Radio Hour. Thank you, Ralph.

Ralph Nader: Thank everybody. Listeners, if you're anywhere near 50 miles from a nuclear plant, you know that they have to make the evacuation plans in case of an accident public. They usually put it in public libraries. Ask your public library. If it's not there, ask your member of Congress to get it to you.