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RE Charpy Testing for PRWs

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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10 CFR 2.206 PETITION REVIEW BOARD (PRB)

CONFERENCE CALL

RE

CHARPY TESTING FOR PWRs

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FRIDAY

JANUARY 22, 2021

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The conference call convened at 10:30 a.m. EST, Gregory Bowman, Chairperson of the Petition Review Board, presiding.

PETITIONER: THOMAS SAPORITO

PETITION REVIEW BOARD MEMBERS

GREGORY BOWMAN, Deputy Director
Office of Nuclear Reactor Regulation

ROBERT KUNTZ, Petition Manager for 2.206 petition

ROBERT CARPENTER, Senior Attorney, Office of General Counsel

NRC HEADQUARTERS STAFF

PERRY BUCKBERG, Petition Coordinator, Office of Nuclear Reactor Regulation

HIPO GONZALEZ, Chief of the Vessels & Internals Branch, Office of Nuclear Reactor Regulation

ALLEN HISER, Ph.D., Senior Technical Advisor for License Renewal Aging Management, Office of Nuclear Reactor Regulation

NATE JORDAN, Backup Petition Coordinator, Office of Nuclear Reactor Regulation

JENNY TOBIN, Project Manager, Office of Nuclear Reactor Regulation

ON YEE, Materials Engineer, Office of Nuclear Reactor Regulation

T-A-B-L-E O-F C-O-N-T-E-N-T-S

P-R-O-C-E-E-D-I-N-G-S

10:31 a.m.

MR. KUNTZ: The meeting is being recorded by the NRC Ops Center and will be transcribed by a court reporter and the transcripts will become a supplement to the petitions. The transcript will also be made publicly available.

Before we start I'd like to thank everyone for attending this meeting. The purpose of today's meeting is to provide the Petitioner, Nuclear Energy Oversight Project, an opportunity to address the Petition Review Board regarding the petitions related to Charpy testing for all pressurized water reactors and at -- specifically at the Beaver Valley Power Station Unit 2.

My name is Rob Kuntz and I'm a senior project manager in the Division of Operating Reactor Licensing in the Office of Nuclear Reactor Regulation. I'm also a petition manager for these petitions.

The PRB typically consists a chairman, who's usually a manager at the senior executive service level at the NRC. It has a petition manager and includes a petition coordinator. Other members of the Board are determined by the NRC staff based on the concept of the information in the petition request.

The PRB chairman is Gregory Bowman, Deputy Director in the Division of Risk Assessment in the Office of Nuclear Reactor Regulation.

This is a Category 1 meeting. The public is invited to observe this meeting and will have an opportunity to communicate with the NRC after the business portion, but before the meeting is adjourned. This does not preclude the Licensee from responding to questions if they choose to do so.

There are three categories of NRC public meetings. More detailed information of these meetings can be found on the NRC public website, www.nrc.gov.

As a public meeting, there will be no safeguards or official use-only information discussed. As part of the PRB's review of these petitions, Nuclear Energy Oversight Project has requested this opportunity to address the PRB.

This meeting is scheduled to begin at 10:30 and end at 11:30 Eastern. After introductory remarks, we will allow Nuclear Energy Oversight Project to address the Board followed by a brief question and answer phase.

I'd like to open this meeting with introductions. To better facilitate introductions over the phone of the list of people registered for

today's meeting, I will read each person's name on the list. When you hear your name, please acknowledge you are on the phone and clearly state your name, your position, and the office or organization you work for so we have the information for the record.

Again my name is Rob Kuntz and I am a senior project manager in the Division of Operating Reactor Licensing.

So let me start with the NRC staff. Gregory Bowman?

MR. BOWMAN: Yes, this is Greg Bowman. I'm the Deputy Director of the Division of Risk Assessment and the PRB Chair.

MR. KUNTZ: On Yee?

MR. YEE: This is On Yee, materials engineer, Division of New and Renewed Licenses.

MR. KUNTZ: Allen Hiser?

DR. HISER: Allen Hiser, Senior Technical Advisor in the Division of New and Renewed Licenses.

MR. KUNTZ: Hipo Gonzalez?

MR. GONZALEZ: Hipo Gonzalez, and I'm the Chief for the Vessels and Internals Branch in NRR.

MR. KUNTZ: Robert Carpenter?

MR. CARPENTER: Yes, Robert Carpenter, Office of the General Counsel, NRC.

MR. KUNTZ: Perry Buckberger -- Buckberg?

MR. BUCKBERG: Hi, this is Perry Buckberg and I'm a senior project manager in Nuclear Reactor Regulation and I'm the Agency 2.206 petition coordinator. Thanks.

MR. KUNTZ: Jenny Tobin?

MS. TOBIN: Jenny Tobin, also DORL project manager specifically for Beaver Valley.

MR. KUNTZ: Okay. Is there any other members of the NRC staff on the line that would like to introduce themselves?

MR. JORDAN: Yes, this is Nate Jordan, project manager, Division of Operating Reactor Licensing and I also serve as the Agency's backup 2.206 petition coordinator.

MR. KUNTZ: Thanks, Nate, anyone else?

Okay. Hearing none, at this point I'll turn it over to the Petitioner, Mr. Thomas Saporito.

MR. SAPORITO: Good afternoon. This is Thomas Saporito. I'm the Executive Director for the Nuclear Energy Oversight Project. We're a licensed corporation based in the State of Florida.

On this date, January 22nd, 2021, the Nuclear Energy Oversight Project filed a January 22nd, 2021 supplement to its 10 CFR 2.206 petitions dated

October 31st, 2020 and November 6th, 2020 for Charpy testing.

MR. KUNTZ: Mr. Saporito --

MR. SAPORITO: You have a copy -- yes, sir?

MR. KUNTZ: Mr. Saporito, we're just going through introductions now. We'll come back to your presentation.

MR. SAPORITO: Oh, okay.

MR. KUNTZ: Yeah, can we finish the -- we'll finish the introductions.

Was there anyone else from Nuclear Energy Oversight Project that you'd like to introduce today?

MR. SAPORITO: No, sir.

MR. KUNTZ: Okay. Thank you; next Licensee Energy Harbor. Is Phil Lashley on the phone?

MR. LASHLEY: Phil Lashley is on the call.

MR. KUNTZ: Okay. Matthew Snyder?

(No audible response.)

MR. KUNTZ: Okay. Eric Perez?

(No audible response.)

MR. KUNTZ: Was there anyone else from Energy Harbor on that would like to introduce themselves?

MR. McMULLEN: Yes, Ken McMullen, nuclear

engineer with Energy Harbor's Fleet Licensing Group.

MR. KUNTZ: Thank you, anyone else from Energy Harbor?

Okay. Hearing none, State of Pennsylvania, Lawrence Winker, are you on?

MR. WINKER: Yes, I'm on. Yes, I'm with the State of Pennsylvania Bureau of Radiation Protection, and I'm assigned to the Beaver Valley Plant.

MR. KUNTZ: Thank you, Mr. Winker.

Members of EPRI; I'm sorry, is there anyone else from the State of Pennsylvania on that would like to introduce themselves?

Okay, hearing none, EPRI. Is Steven Williams on?

MR. WILLIAMS: Yes, I'm Steven Williams from Electric Power Research Institute. I'm a principal lead, technical lead in the Boiling Water Reactor Vessels and Internals Program.

MR. KUNTZ: Thank you. Nathan Palm?

(No audible response.)

MR. KUNTZ: Okay. Bob Carpenter, are you on, or Carter, I'm sorry, Bob Carter?

(No audible response.)

MR. KUNTZ: Okay. Was there any members

of the public --

PARTICIPANT: Neither of those will be on the call.

MR. KUNTZ: Okay, great, is there any other members of the public on the line that would like to introduce themselves at this time?

Okay. Hearing none, I'd like to emphasize that we each need to speak clearly and loudly to make sure that the court reporter can accurately transcribe this meeting. If you do have something that you would like to say, please first state your name for the record.

For those dialing into the meeting, please remember to mute your phones to minimize any background noise or distractions. If you do not have a mute button, this can be done by pressing *6. To un-mute, press *6 again. Thank you.

The agenda for today's meeting after this introduction is for the Petitioner, Mr. Saporito, to provide new information to the PRB for the PRB to consider in the petition's acceptability for review or final assessment. After the Petitioner's presentation we will enter a brief question and answer phase.

At this time I'll turn the meeting over the PRB Chair, Mr. Greg Bowman.

MR. BOWMAN: Thanks, Rob.

I'd like to welcome everyone to this meeting, which as Rob mentioned, is regarding 2.206 petitions submitted by Nuclear Energy Oversight Project. I'd like to share first some background on our process.

So Section 2.206 of Title 10 of the Code of Federal Regulations describes the petition process. It's the primary mechanism for the public to request enforcement action by the NRC related to NRC licensees or licensed activities. Depending on the results of our evaluation of a petition, the NRC could modify, suspend, or revoke an NRC-issued license or take any other enforcement action.

The guidance that we use to disposition 2.206 petition requests is found in Management Directive 8.11, which is publicly available and can be found on our website.

For the purpose of today's meeting, as Rob discussed, is to give the Petitioner an opportunity to provide any relevant additional information on the petitions after having received the PRB's initial assessment back in December.

Just a couple of kind of ground rules: the meeting is not a hearing, nor is it an opportunity

for the Petitioner or members of the public to question or examine the PRB on the merits or the issues presented in the Petitioner's request. It's really focused on obtaining information from the Petitioner to help us make a decision.

During the question and answer phase of the meeting, the NRC staff may ask clarifying questions of the Petitioner or the Licensee, and the Petitioner or Licensee can ask the PRB questions about the 2.206 process in general.

We will not be making any decisions regarding the merits of the petition at this meeting. Following the meeting we'll conduct internal deliberations, and the outcome of those deliberations will be provided to the Petitioner in a letter.

I'd like to summarize the scope of the petitions under consideration and our activity to date. The Nuclear Energy Oversight Project submitted petitions to the NRC on October 31st and November 8th, 2020. The October 31st petition requested that the NRC take action under 10 CFR 2.206 to issue an immediate shutdown order to pressurized water reactor licensees until those licensees provide first an updated safety analysis of the degree of reactor pressure vessel embrittlement; second a detailed

description of the methodology used to provide the updated safety analysis; and third, a statement of full compliance with NRC regulations.

The November 8th petition requested that the NRC take action under 10 CFR 2.206 to deny and refuse the assertions made by Energy Harbor Nuclear Corporation in its letter dated October 28th, 2020 related to the testing of capsule Y at Beaver Valley. The petition also requested that the NRC issue a confirmatory order requiring the use of a specific impact test machine, issue an order to require the identification of the striker used by Energy Harbor to test capsule Y, and issue an order requiring Energy Harbor to identify any outside contractor used to perform Charpy testing on capsule Y.

On December 21st, the petition manager, Rob, contacted the Petitioner to provide the PRB's initial assessment, which is that the petitions don't meet the criteria in Management Directive 8.11 for evaluation. At that time, the petition manager also offered the Petitioner the opportunity to address the PRB to clarify or supplement the petition in response to our initial assessment. As I mentioned earlier, that's why we're here today.

Rob mentioned this, but I'll reinforce.

When you speak -- if anybody needs to speak up during the meeting, please make sure you identify yourself and your organization if you make any remarks to help us with the transcript.

With that, I'll turn things over to Mr. Saporito to provide any information you believe the PRB should consider as part of the petition. Mr. Saporito, we ask you to try to limit your presentation to about 30 minutes if possible, just so that we have plenty of time to ask questions or get any additional information we need to support our deliberations. So with that, I'll turn things over to you, Mr. Saporito.

MR. SAPORITO: Well, just for the record I did ask -- request for one hour to make my presentation.

Nonetheless, January 22nd, 2021, this date, today I filed a supplement to the January 22nd, 2021 -- or excuse me, to the 10 CFR 2.206 petitions dated October 31st, 2020 and November 8th, 2020 regarding the Charpy testing. In that supplemental petition I indicated a date of November 6th. It should have been November 8th, so you could correct that when you read your copy.

Okay. So the supplement petition requested the following enforcement action:

For the NRC to issue a confirmatory order requiring licensees to state and affirm under oath how the general public could realistically evacuate during a declared emergency, loss of coolant accident, or LOCA, stemming from a fractured nuclear reactor vessel melted reactor core as a direct or indirect result of a pressurized thermal shock event or from degradation from damage of the nuclear reactor vessel from the effects on neutron fluence.

And that the NRC issue a confirmatory order requiring licensees to perform a one-time inspection of the continuous circumferential transition cone closure weld on each steam generator, essential 100 percent examination coverage of each weld, employing non-destructive radiographic testing.

And that the NRC issue a classified information requiring the licensees to perform a one-time inspection of the reactor vessel extended beltline region of the reactor vessel's shell material including welds, heat-affected zones, and plate or forgings adjacent to the beltline region employing non-destructive radiographic testing.

And that the NRC issue a confirmatory order requiring the licensees to modify and reduce nuclear reactor's pressure temperature limits within

the licensee's respective plant technical specification to limit full power operation of their nuclear reactors to no more than 80 percent, to limit the amount of reactor vessel damage, due to neutron fluence during the period of extended operation.

And that the NRC issue a confirmatory order to licensees that submit Charpy testing data to the NRC obtained from another nuclear reactor vessel surveillance capsule as part of the NRC Participant Program, as representative of data showing the degree of neutron fluence damage, or embrittlement, to the licensee's plant-specific reactor vessel, to affirm under oath that the capsule data fully complies with Section I.3 limitations, Subsections 1-3 of NRC Regulatory Guide dated May 1988, Revision 2, accordingly.

And the basis and justification for these requests:

In a 10 CFR 2.206 petition dated October 31st, 2020, Petitioners contended that the current methodology used by NRC licensees to determine the degree of embrittlement of pressurized nuclear reactor vessels is not sufficient to protect the health and safety of the public and the environment.

And that the current Licensee Participant

Program utilized by NRC licensees in sharing pressurized nuclear reactor vessel capsule sample data does not provide sufficient and reliable data to determine the degree of embrittlement of the licensees' pressurized nuclear reactor vessel.

And that the current pressurized nuclear reactor vessel surveillance programs utilized by NRC licensees does not provide sufficient and reliable data to the NRC in determining the degree of embrittlement of a licensee's pressurized nuclear reactor vessel.

And that PWROG-18068, use of direct fracture toughness for evaluation of reactor pressure vessel integrity, is a more accurate methodology to determine the degradation and degree of embrittlement of a pressurized nuclear reactor vessel.

In a 10 CFR 2.206 petition dated November 8th, 2020, petitioners averred that:

The NRC cannot accept or rely on the data provided by the licensee regarding reactor vessel capsule Y analysis report WCAP-18558-NP because the licensee failed to identify the model number of the Instron Impulse system which the Charpy machine striker was instrumented with.

And the NRC cannot accept or rely on the

data provided by the licensee regarding the reactor vessel capsule Y analysis report WCAP-18558-NP because the licensee obtained data on the Beaver Valley Power Station Unit No. 2, BVPS-2, reactor vessel capsule Y using an outdated Charpy test machine which is apparently no longer manufactured and has been since replaced by the vendor with more accurate Charpy test machines which do not involve interpretation of an analog gauge by a human, and which newer machines employ a digital display that can be directly linked to a personal computer and connected to a Tinius Olsen's Horizon software.

On December 21st, 2020 the NRC Petition Review Board provided an initial assessment of the October 31st, 2020 and November 8th, 2020 petitions. With respect to the October 31st, 2020 petition, the Petition Review Board stated that:

Instrument Charpy testing is not necessary to demonstrate compliance with regulations or to assessment embrittlement of the reactor pressure vessel consistent with guidance in Regulatory Guide 1099, Radiation Embrittlement of Reactor Vessel Materials, Revision 2, ADAMS Accession No. ML031430205.

The NRC staff reviews and approves the use

of integrated surveillance programs in lieu of plant-specific surveillance programs and ensures that the representative materials chosen for the surveillance for an reactor pressure vessel are irradiated in one or more other reactors that have similar design and operating features to permit accurate comparisons of the predicted amount of radiation damage. Other factors such as transient behavior during reactor trips raised in the petition have no discernible impact on the ability of surveillance specimens from one plant to provide relevant data to assess radiation embrittlement of another plant, since the elastic deformation of the reactor pressure vessel steel due to such evolutions does not affect the degree of embrittlement.

And it went onto to say that since reactor pressure vessel fluence calculations explicitly consider the actual plant operating history, the additional neutron fluence from a power uprate or license renewal is incorporated in the plant-specific calculations.

The PRB stated with respect to direct fracture toughness measurements as referenced in PWROG-18068 -- the NRC PRB stated that the addition of these requirements would not have a corresponding

benefit to public health and safety.

With respect to the November 8th, 2020 petition the PRB stated in part that:

The use of manual reading of data provides sufficiently accurate readings of the absorbed energy to fracture the surveillance specimens consistent with the pertinent consensus codes and standards to adequately assess the condition of the reactor pressure vessel.

And that the use of instrumented Charpy testing apparatuses are capable of providing the data necessary to adequately assess reactor pressure vessel embrittlement; however, the mandatory use of these apparatuses is beyond the current regulations.

And that given that the NRC's regulatory framework relies on consensus codes and standards, it is not necessary for the staff to require the use of the most up-to-date apparatus to perform instrumented Charpy testing.

On this date, January 22nd, 2021, Petitioners state in further support of the requested NRC enforcement action that:

The NRC Petition Review Board's initial response dated December 21st, 2020 to the aforementioned petitions appears to be:

(1) A fraud on the American people with respect to the NRC's acceptance of the licensees' submittal of data purported to represent the degree of embrittlement of pressurized reactor vessels due to damage caused by neutron fluence.

(2) A waste of taxpayer funds appropriated by the United States Congress to the Nuclear Regulatory Commission with respect to the expenditure of NRC resources in rubber stamping license extensions of nuclear reactors up to 80 years and 40 years beyond their original safety design basis and apparently in collusion with its licensees to continue the operation of the NRC and its federal employees as an ongoing federal agency to regulate the nuclear power industry:

(3) a gross abuse of authority and power by the NRC in granting license extensions up to 80 years in direct violation of the NRC's congressional mandate to protect the health and safety of the public and to protect the environment from the catastrophic effects from a serious nuclear loss of coolant accident caused by a cracked reactor vessel damaged and embrittled by neutron fluence during extended power operations beyond the reactor vessel's original 40-year safety design basis.

United States government agencies have

colluded with private sector industries in the past, and have mislead the public regarding safety, which resulted in deaths.

The United States Federal Aviation Administration colluded with Boeing.

On September 16th, 2020 the chair of the House Committee on Transportation and Infrastructure, Peter DeFazio, and chair of the Subcommittee on Aviation Rick Larsen released the Committee's final report on the Boeing 737 MAX. This report prepared by majority staff lays out the serious flaws and missteps in the design, development, and certification of the aircraft, which entered commercial service in 2017 before suffering two deadly crashes within five months of each other that killed a total of 346 people, including eight Americans. The Committee's 238-page report, which points to repeated and serious failures by both the Boeing Company and the Federal Aviation Administration, contains five central themes and includes more than six dozen investigative findings. These themes include:

Production pressures that jeopardized the safety of the flying public. There was tremendous financial pressure on Boeing and the 737 MAX Program to compete with Airbus' new A320neo aircraft. Among

other things this pressure resulted in extensive efforts to cut costs, maintain the 737 MAX Program schedule, and avoid slowing the 737 MAX production line.

Second, the faulty design and performance assumptions. Boeing made fundamentally faulty assumptions about critical technologies on the 737 MAX, and most notably the MCAS system, the software designed to automatically push the airplane's nose down in certain conditions. Boeing also expected that pilots, who were largely unaware MCAS existed, would be able to mitigate any potential malfunction.

And third, culture of concealment. Boeing withheld crucial information from the FAA, its customers, and 737 MAX pilots, including internal test data that revealed it took a Boeing test pilot more than 10 second to diagnose and respond to un-commanded MCAS activation in a flight simulator, a condition the pilot described as catastrophic. Federal guidelines assume pilots will respond to this condition within four seconds.

In another town the National Highway Traffic Safety Administration colluded with the auto industry.

On June 2nd, 2005, the National Highway

Traffic Administration, NHTSA, estimates that airbags installed in automobiles have saved some 10,000 lives as of January 2004. A just-released study by a statistician at the University of Georgia however casts doubt on that assertion. In fact, said UGA statistics professor Mary C. Meyer, a new analysis of existing data indicates that, controlling for other factors, airbags are actually associated with slightly increased probability of death in accidents.

NHTSA recorded 238 deaths due to airbags between 1990 and 2002 according to information about these deaths on their website, said Meyer. They all occurred at very low speeds with injuries that could not have been caused by anything else. But is it reasonable to conclude that airbags cause death only at very low speeds? It seems more likely that they also cause deaths at high speeds, but these are attributed to the crash.

The National Highway Traffic Safety Administration estimates that airbags installed in automobiles have saved some 10,000 lives as of January 2004. A just -- excuse me.

When we -- that was an unintended repeat of the same verbiage.

When we look at the random sample of all

accidents we find that airbags are associated with increased risk of death, she said, and this increase is due to more deaths with airbags in low-speed crashes and no seat belts. However, if we limit the data set to include only collisions in which a fatality occurred, we get a significantly reduced risk of death due to airbags.

By way of analogy Meyer explained it this way: If you look at people who have some types of cancer, you will see that those who get radiation treatment have a better chance of surviving than those who don't. However, radiation is inherently dangerous and could actually cause cancer. If you give everyone radiation treatments, whether they have cancer or not, you will probably find an increased risk of death in the general population.

Making everyone have airbags and then verifying the effectiveness of using only fatal crashes is like making everyone get radiation and then estimating the lives saved by looking only at people who have cancer. Overall, there will be more deaths if everyone is given radiation, but in the cancer subset, radiation will be effective.

The new study directly contradicts assertions about airbag safety on the NHTSA website,

said Meyer. The correct analysis is important to obtain now because in only a few years there will be virtually no cars on the road without airbags. We are confident that our analysis better reflect the actual effectiveness of airbags in general than earlier studies. The evidence shows that airbags do more harm than good.

And thirdly, the United States Atomic Energy Commission colluded with the General Electric Company and the nuclear industry.

In a March 26th, 2013 publication, Arnie Gundersen, a former nuclear engineer, stated that, dismissing pleas from citizen groups in local United States communities where General Electric's Fukushima-style reactors operate and ignoring expert testimony from independent nuclear engineers, the NRC voted earlier this month against a plan to require utility owners to upgrade nuclear plant filtering systems with vents, or radiation scrubbers, intended to reduce but not eliminate radiation levels when the vents are opened in a severe accident.

The nuclear industry's congressional allies fought the proposal. Safety gains should be significant enough to outweigh the additional costs to be paid by the industry, said Representative John

Shimkus, chairman of the Energy and Commerce Subcommittee. While Senator Barbara Boxer, in a letter sent to the NRC last month, wrote, the tens of millions of Americans who live near the affected reactors located in 15 states could not face additional delays.

This is not just a Fukushima-Daiichi issue. The issues in the United States are in some ways much worse, warned Arnie Gundersen, a week before the vote was taken in the kickoff presentation at a symposium on the Fukushima disaster held in mid-March at the New York Academy of Sciences in New York City. It was sponsored by the Helen Caldicott Foundation and Physicians for Social Responsibility.

Gundersen is a former nuclear industry engineer turned whistleblower and his ongoing reports over the last two years on the Fukushima-Daiichi in Japan repeatedly raise warnings about the GE reactors and their vulnerability to accidents. The main difference between the United States and Japan -- and the Japanese GE plants is the extreme amount of highly-radioactive spent fuel stored in reactor spent fuel pools which are located five stories above the reactors. The U.S. spent fuel pools in the GE's Fukushima-style reactors each contain more irradiated

fuel than the total in all four reactor pools at the Fukushima plant.

Following the initial news reports of explosions at the Fukushima plant inside the GE reactor containment buildings, stories quickly appeared reporting that the federal nuclear safety regulators who licensed the reactors knew about their design flaws but did not stop GE from selling them. Scientists in the United States recognized in 1965 that this Mark 1 had design flaws, Gundersen said, but GE threatened to pull out of the commercial reactor business if forced to make costly design changes. Gundersen recalled a comment by Glenn Seaborg, chairman of the Atomic Energy Commission from 1961 to 1971, who said in an interview years later, I didn't think that we had the power to stop them. Think about that, said Gundersen. This is the United States government. It didn't have the power to stop General Electric's faulty design in 1966.

At the time GE and Westinghouse were in fierce competition for top place in the new commercial reactor industry. GE was willing to take a loss on sales of its Mark 1 boiling water reactor, and it did. GE lost millions, Gundersen said. Our people understood this was a game with massive stakes, and

that if we didn't force the utility industry to put these stations on line, we'd end up with nothing, a GE VP told Fortune Magazine in an interview in 1970.

Atomic Energy Commission documents reveal that federal safety experts recommended banning the Mark 1's pressure suppression containment system and cited its vulnerability to an explosion that would follow a loss of coolant accident. The concerns were dismissed by Joseph Hendrie, then the AEC's top safety regulator, who was later appointed NRC chairman. In a 1972 memo Hendrie thought such an action could well be the end of nuclear power and would create more turmoil than I can stand thinking about. So the turmoil that Hendrie chose to avoid in 1972 became the turmoil that Japan suffered 40 years later, Gundersen said.

Now, today, the NRC amends the reactor Vessel Material Surveillance Program requirements for commercial light water reactors.

On December 29th, 2020 the NRC finalized and amended the Reactor Vessel Material Surveillance Program requirements for commercial light water reactor. See Federal Register Volume 85, Issue 249. In so doing the NRC appears to have significantly increased the risk to public health and safety by:

(1) Eliminating the testing of certain specimen materials inside capsules placed within the pressurized nuclear reactor vessels by licensees.

(2) By extending the reporting time requirements for the test results of the specimen material of the capsules by licensees.

(3) By eliminating the requirement for licensees to include or test heat-affected zone specimens as part of the Reactor Vessel Material Surveillance Program.

(4) By revising Appendix H to 10 CFR, Part 50 to make optional the requirement to include or evaluate temperature monitors as part of the Reactor Vessel Material Surveillance Program.

Petitioners note here that the NRC's new rules apply to extended operation of pressurized nuclear reactors for up to 80 years, and that the NRC is actively working with the nuclear industry to extend operations to 100 years.

Petitioners challenged these rule changes by submitting comments to the NRC via the NRC website for such public participation. However, the NRC never contacted Petitioners regarding their opposition views, but instead simply ignored Petitioner's safety concerns related to the NRC's rule changes, and

adopted the changes nonetheless.

Petitioners aver here that the NRC, acting in concert with the nuclear industry, finalized the Reactor Vessel Material Surveillance Program requirements for pressurized nuclear reactor vessels to:

(1) Allow the nuclear industry to continue to operate old nuclear reactors which were originally constructed with only a 40-year safety design basis.

(2) To protect and ensure numerous NRC jobs that depend on the nuclear industry's continued operation of old pressurized nuclear reactors. Petitioners contend that the NRC's actions in finalizing the new rule for the Reactor Vessel Material Surveillance Program requirements jeopardize public health and safety, and that the NRC appears to have colluded with the nuclear industry for the economic benefit of its licensees and for the longevity benefit of NRC jobs and the NRC's existence as a federal agency.

To the extent that the NRC appears to have engaged in misconduct in violation of its own policies and mission statement and congressional mandate as described immediately above, Petitioners request that the NRC Petition Review Board provide the NRC Office

of the Inspector General with a copy of the record transcript of this teleconference call and any and all other documents, notes, emails and other communications and correspondence by the NRC related to this matter, in accordance with NRC policy at MD 7.4, Reporting Suspected Wrongdoing and Processing OIG Referrals. See Appendix B - Guide for Processing 10 CFR 2.206 Petition, at page 1, Section I.B.3.

Petitioners note here for the public record that the NRC Office of the Inspector General has opened up an allegation under A 21 08848 with respect to the subject matter of 2.206, Pressurized Reactor Vessel Embrittlement Issue. Therefore, any assistance on the part of the NRC in assisting the Office of the Inspector General in its open investigation in this matter will serve to further protect the health and safety of the public and to protect the environment and is appreciated.

At this time I'm going to provide clarification and further basis and justification for these petitions, including the supplement.

As a threshold matter, the Atomic Energy Act of 1954, as amended, authorizes the NRC to issue operating licenses to nuclear plant operators and also authorizes renewal of expired operating licenses and

states in relevant part that: Each such license shall be issued for a specific period as determined by the Commission, depending on the type of activity to be licensed, but not exceeding 40 years from the authorization to commence operations, and may be renewed upon the expiration of such period. See 42 United States Code at Part 2133(c).

Petitioners contend here that the NRC appears to have violated the Atomic Energy Act in renewing operating licenses for extended power operations of its licensees before the expiration of the prior period. To the extent that the NRC's actions in granting its licensees extended power operational licenses before the expiration of the prior period, the extended power operational licenses are not valid. Therefore, Petitioners request that the NRC issue a confirmatory order requiring all licensees who were granted extended power operational licenses by the NRC before the expiration of the prior period to immediately shut down their respective nuclear reactors.

Common sense shows that NRC regulations relied upon by the NRC licensees such as the Florida Power & Light Company in the early 1970s, who were granted operating licenses for the Turkey Point

Nuclear Plant Units 3 and 4, employed highly-qualified, degreed nuclear engineers who complied with the NRC Regulatory Guides at that time with respect to estimating or guesstimating the expected amount of damage to the nuclear reactor vessel due to neutron fluence for the original 40-year safety design basis of the reactor vessel.

Subsequently, NRC nuclear engineers reviewed FPL's license amendment requests and estimated neutron fluence damage to the reactor vessel, or embrittlement, and issued two operating licensees for a 40-year period of operation. As the years passed, the American people through innovation discovered and developed other means to generate electric power, and generally opposed nuclear power operation. Petitioners aver here that the NRC and the nuclear industry feared the end of the nuclear power in the United States was at hand and therefore the NRC, in concert with the nuclear industry, made a decision to grant operating license extensions up to 80 years and 40 years beyond the original safety design basis for nuclear reactors.

To the extent that both the licensee's nuclear engineers and those of the NRC who originally justified operations of pressurized reactor vessels

for only 40 years due to concerns of the degree of embrittlement of reactor vessel from neutron fluence can now somehow contend via estimates and guesstimates using vague formulas with assumptions about the amount of error in the calculations of neutron fluence in the NRC regulations strains all reasonable thinking. Rather, it appears that the NRC, in concert with the nuclear industry, are working together to extend operations of pressurized reactor vessels up to 80 years and possibly 100 years in the United States at the expense of public health and safety.

This becomes even more evident in reviewing numerous licensee applications for extended operations where it appears that the NRC accepts a cookie cutter generic type of application requiring both pressurized reactor vessels and boiling water reactor to respond to various technical questions using the very same application instead of the NRC having two separate applications. To the extent that the NRC and its licensees can somehow look an additional 40 years into the future and issue an Environmental Impact Statement as part of a licensee's application for extended power operations is well beyond belief and absolutely not realistic. It appears to be fraud.

Petitioners further contend here that the licensed operations of a pressurized reactor vessel with 200 miles or less of Washington, D.C. in extended power operations beyond the pressurized reactor vessel's original 40-year safety design represents an unwarranted and unacceptable risk to the national security and common defense of the United States of America. For this reason standing alone, the NRC should issue a classified information requiring licensees of such located pressurized reactor vessels to immediately shut down.

Licensee emergency plans are not sufficient to protect the health and safety of the public during a declared general emergency due to a loss of coolant accident, or LOCA, stemming from a fractured nuclear reactor vessel and resulting core meltdown caused by a damaged reactor vessel from the effects of neutron fluence which caused the reactor vessel to fracture during a reactor trip and subsequent pressurized thermal shock event. Indeed, the Fukushima nuclear disaster and reactor core meltdowns resulted in massive evacuations, and the United States Nuclear Regulatory Commission recommended that the public in Japan be evacuated in a 100-mile radius of the damaged nuclear reactors and

not the 50-mile radius currently embraced in licensee evacuation plans in the United States.

The NRC must require its licensees to perform a one-time inspection of the continuous circumstantial -- circumferential transition cone closure weld on each steam generator, essential 100 percent examination covers of each weld, employing radiographic testing, and this is required to protect the health and safety of the public during a 60-year or 80-year period extended power operations of pressurized reactor vessels.

The failure of this weld would absolutely result in a major nuclear loss of coolant accident which would kill and harm millions of Americans in the United States. Radiographic testing is the only reliable method of testing and examination to ensure that no cracks or voids exist in the weld. Radiographic testing (1) provides an extremely accurate permanent record; and (2) is very sensitive and can expose cracks and voids where other testing methods cannot.

Therefore it is imperative that licensees perform radiographic testing on these areas of their respective reactor vessels to protect the health and safety of the public during extended power operations.

The failure of licensees to conduct such radiographic testing is not a sufficient reason to justify extended power operations for 60 years or 80 years, because Charpy testing of reactor vessel capsule materials is not sufficient or reliable in determining the degree of neutron damage to the reactor vessel over a 60-year or 80-year period of extended power operations.

The NRC must require licensees to perform a one-time inspection of the reactor vessel extended beltline region of the reactor vessel shell material including welds, heat-affected, and plate or forgings adjacent to the beltline region employing non-destructive radiographic testing. The failure of this weld would absolutely result in a major loss of coolant accident which would kill and harm millions of Americans in the United States. Radiographic testing is the only reliable method of testing and examination to ensure that no cracks or voids exist in the weld.

Therefore, it is imperative that licensees perform radiographic testing on these areas of their respective reactor vessels to protect the health and safety of the public. Failure of the licensees to conduct such testing is not sufficient reason to justify power operations for 60 years or 80 years, because Charpy testing of reactor vessel capsule

materials is not sufficient nor reliable in determining the degree of neutron damage to the reactor vessel over a 60-year or 80-year period of extended power operations.

Moreover, the NRC Regulatory Guide 1.99, Revision 2, May 1988, at paragraph B.3 states that:

The definition of reactor vessel beltline given in Paragraph II.F of the Appendix G requires identification of the region of the reactor vessel that are predicted to experience sufficient neutron radiation embrittlement to be considered in the selection of the most limiting material. Paragraphs III.A and IV.A.1 specify the additional test requirements for beltline materials that supplement the requirements for reactor vessel materials generally.

Thus, it is imperative that licensees perform a one-time inspection of the reactor vessel extended beltline region of the reactor vessel shell material including welds, heat-affected, and plate forgings adjacent to the beltline region employing non-destructive radiographic testing.

In addition, a modification to each licensee's nuclear reactor pressure-temperature limits within the licensee's respective plant technical

specifications to limit full-power operation of their nuclear reactors to no more than 80 percent is required to limit the amount of reactor vessel damage due to neutron fluence during the period of extended operations. This is true because both the licensees and the NRC are simply guessing about the amount of damage or embrittlement to the reactor vessel -- will be sustained due to neutron fluence during the period of extended power operations. Thus, the described operational modifications will serve to protect the public -- the health and safety of the public.

One characteristic of the reactor vessel steels is that their material properties change as a function of temperature and neutron irradiation. The primary property of interest for the purposes of reactor vessel integrity is the fracture toughness of the reactor vessel material. Extensive experimental work determined that Charpy impact tests, which measure the amount of energy required to fail a small material specimen, can be correlated to changes in fracture toughness of the material. Thus, the Charpy impact specimens from the beltline materials; i.e., base metal, weld metal, and heated-affected zone, became the standard to assess the change in fracture toughness in ferric steels. The fracture toughness of

reactor vessel materials decreases with decreasing temperature and with increasing irradiation from the reactor. See Federal Register Volume 85, No, 192, Friday, October 2nd, 2020.

Petitioners aver here that while Charpy impact testing was used on pressurized reactor vessel capsule samples for up to a 40-year period of operation, Charpy impact testing is not sufficient to ascertain the amount of damage or embrittlement sustained by a pressurized reactor vessel from neutron fluence over a 60 or 80-year or 100-year period of extended power operations.

The Army Materials and Mechanics Research Center, or AMMRC, managed a program for many years on the certification of Charpy impact machines. What is evident is that each model machine possesses its own characteristic weaknesses which, unless controlled, can easily result in erroneously high test values. It is estimated that approximately half of the machines in use today are producing values well in excess of the limits set in Army specifications; that is, plus or minus five percent or one foot-pound, whichever is greater.

Since most discrepancies either slow down the pendulum or result in absorptional losses, the

value recorded includes energy not expended in fracturing the specimen, thus creating a false sense of security for the investigator or design engineer. See N. Fahey, F-A-H-E-Y, The Charpy Impact Test - Its Accuracy and Factors Affecting Test Results, in Impact Testing Metals, ed. D. Driscoll, in parentheses, (West Conshohocken -- it's spelled C-O-N-S-H-O-H-O-C-K-E-N -- PA; ASTM International, 1970), close parentheses, 76-92.

Petitioner further aver that while Charpy impact tests are useful in the analysis and prediction of the behaviors of different materials under impact stresses or dynamic loading, such tests cannot directly predict the reaction of a material to real life loading. Instead, results can only be used for comparison purposes. Like hardness tests, impact tests do not result in a number that definitively describes the material's toughness. Instead, impact tests yield comparative data which is interpreted in combination with an analysis of the broken surfaces of the test specimens themselves. The performance of a specimen in a Charpy impact test is however influenced by many factors beyond material composition and temperature such as yield strength and ductility and placement and size and shape of the notches and strain

rate and a fracture mechanism. All affect the performance of a sample.

When as many of the factors are held constant as possible, the results of the impact test reflect the toughness of the material, although even then, values found are useful only to compare to other results and not as a simply defined property that can be stated universally as a single value. See E59 Laboratory Report, submitted October 21, 2008, Department of Engineering, Swarthmore College.

Moreover, dynamic tests such as the Charpy impact test yield information regarding energy absorbed in breaking the test piece. This approach is useful in comparing materials but gives virtually no information regarding intrinsic properties of the material such as fracture toughness. See January 14th, 1977, Department of Defense, Australian Defense Scientific Service Materials Research Laboratories, Maribyrnong, spelled M-A-R-I-B-Y-R-N-O-N-G, Victoria.

Thus, Petitioners aver here that Charpy impact testing is not sufficient, it is not dispositive, and cannot be relied upon by licensees or the NRC to determine the neutron damage or embrittlement to a pressurized reactor vessel due to neutron fluence. Moreover, as referenced in the 2.206

petitions plant-specific loading, i.e. reactor trips, directly challenge the integrity of the pressurized reactor vessel and should be considered by licensees in assessing the degree of pressurized reactor vessel embrittlement, especially when licensees engage in the NRC Reactor Capsule Surveillance Data Sharing Program.

This is true because every time that a nuclear reactor vessel trips off-line, a pressurized thermal shock event occurs where safety injection pumps induce -- introduce cool water directly into the extremely hot reactor vessel. During the pressurized thermal shock event, the integrity of the reactor vessel is challenged. Each time that the integrity of the reactor vessel is challenged by a pressurized thermal shock event, the reactor vessel material contracts due to the introduction of the cool water. Thus, the integrity of a reactor vessel may fail during a pressurized thermal shock event, depending on how embrittled the reactor vessel has become due to neutron fluence during extended power operations.

As stated earlier, both licensee nuclear engineers and NRC nuclear engineers originally believed that the integrity of a reactor vessel could only be maintained over the reactor vessel's original 40-year safety design basis. Thus, the NRC and its

licensees are engaged in an experiment, at the expense of public health and safety, to see just how long the integrity of a reactor vessel can be maintained during extended power operations up to 80 years.

Petitioners further contend that the test capsule data provided to the NRC by licensees who are part of the Reactor Vessel Surveillance Program where capsule Charpy test data are taken from one nuclear reactor vessel is submitted to the NRC as representative of the amount of neutron damage to the reactor vessel of another reactor vessel is not sufficient to accurately determine the amount of neutron damage or embrittlement of the latter reactor vessel.

First, there is no single test location authorized by the NRC or utilized by licensees where Charpy impact testing is performed. Therefore, the testing performed by one vendor can widely vary in accuracy from another vendor depending on the testing facility's equipment, testing procedures, qualifications of employees conducting the tests, human interpretation of the test results, gravity effects on the testing machine, the vintage of the testing machine, the placement of the specimen in the testing machine, the machining of the v-notch in the

test specimen, et cetera, et cetera, et cetera.

Second, as stated earlier, Charpy testing should only be used for comparative analysis and cannot be relied upon by licensees to represent the degree of embrittlement of their respective reactor vessels. This is true regardless of the tolerance allowed in NRC Regulatory Guide 1.99, Revision 2, May 1988.

To the extent that licensees submit Charpy tests results to the NRC for test results of capsule test samples taken from another reactor vessel and not their plant-specific reactor vessel, the data submitted to the NRC is further erroneous and not representative of the degree of embrittlement of the licensee's plant-specific reactor vessel. This is true because the placement of the test capsule inside the reactor vessel, the distance that the capsule is placed from the reactor vessel wall, the height of placement, the operational history of the reactor vessel, the exact properties of the reactor vessel material, et cetera, results in different neutron fluence data obtained from one reactor vessel to another.

Third, NRC Regulatory Guide 1.99, Revision 2, May 1988, states in part that:

The calculative procedures given in Regulatory Position 1.1 of this guide are not the same as those given in the Pressurized Thermal Shock rule at Part 50.61, Fracture Toughness Requirements for Protection Against Pressurized Thermal Shock Events, of 10 CFR Part 50, for calculating RT, subset PTS, the reference temperature that is to be compared to the screening criteria given in the rule. The information on which this Revision 2 is based may also affect the basis for the Pressurized Thermal Shock rule. The staff is presently considering whether to propose a change to Part 50.61.

Petitioners contend here that licensees who are operating pressurized reactor vessels, nuclear reactors, in extended power operations beyond the pressurized reactor vessel's original 40-year safety design basis and who justified in their respective license amendment requests for extended power operations by referencing and relying on and using the NRC Regulatory Guide 1.99, Revision 2, May 1988, are conducting licensed operations of nuclear reactors in violation of NRC regulations and requirements in 10 CFR Part 50 and Part 50.61. This is true because NRC Regulatory Guide 1.99, Revision 2, May 1988 contains information on which Revision 2 is based that may also

affect the basis for the Pressurized Thermal Shock rule.

Therefore, pressurized reactor vessels that are operating in extended power operations may experience a pressurized thermal shock event that causes the reactor vessel to crack. Such an event would result in a loss of coolant accident causing the affected licensee to declare a general emergency nuclear accident. To the extent that licensees are only required to evacuate a 10-mile area around the nuclear facility, the loss of coolant accident would kill thousands of people.

Furthermore, such a nuclear accident would result in a complete core meltdown and a resultant explosion destroying the containment building due to a buildup of hydrogen released into the containment building. The plume of radioactive particles released into the environment would travel with the prevailing winds and would permanently contaminate areas, for example, Washington, D.C., causing the permanent evacuation in the nation's capital.

Petitioners contend that extended power operations of existing pressurized reactor vessels represent an unwarranted risk to the national security and common defense of the United States and to the

health and safety of the public, and that the NRC should issue a confirmatory order requiring the immediate shut down of all pressurized reactor vessels currently operating in extended power operations.

Fourth, for the reasons stated above, Charpy testing is not sufficient to justify extended power operations for 60 years or 80 years or 100 years to ascertain the degree of embrittlement of each licensee's plant-specific reactor vessel as required in the NRC Regulatory Guide 1.99, Revision 2, May 1988, and that Revision 2 cannot be relied upon by licensees to justify extended power operations of pressurized reactor vessels for the reasons previously stated above.

Fifth, NRC Regulatory Guide 1.99, Revision 2, May 1988 at page 2, Surveillance Data Available, states in part that:

When two or more credible surveillance data sets, as defined in the discussion, become available from the reactor in question, they may be used to determine the adjusted reference temperature and the Charpy upper-shelf energy of the beltline materials as described in Regulatory Position 2.1 and 2.2, respectively.

Thus, Petitioners aver here that the NRC

Regulatory Guide 1.99, Revision 2, May 1988 requires NRC licensees to submit Charpy test data from pressurized reactor vessel capsule samples taken from their plant-specific pressurized reactor vessels and that licensees are not authorized to submit Charpy data from another pressurized reactor vessel employed in the NRC Participant Reactor Vessel Surveillance Program.

Sixth, Regulatory Guide 1.99, Revision 2, May 1988, Radiation Embrittlement of Reactor Vessel Materials, provides for the use of two substantially different methods for determining through-wall fluence in nuclear reactor pressure vessels. One method is a generic attenuation curve based on a simplistic exponential decay equation. Partly due to the simplicity of its application, the generic attenuation method is predominantly used for licensing calculation. However, it has a limitation in that at -- in increasing distance away from the core beltline, it becomes increasing less accurate, because it cannot account for neutron streaming effects in the cavity region surrounding the pressure vessel.

The other attenuation method is based on a displacement per atom, or dpa, calculation specific to the reactor vessel structure. The dpa method

provides a more accurate representation of fluence attenuation through the reactor vessel, PRV, wall at all elevations of the pressurized reactor vessel because it does account for neutron streaming in the cavity region. A requirement for using the dpa method, however, is an accurate flux solution through the reactor pressure vessel wall. This requirement has limited the use of traditional transport methods such as discrete ordinates and that are limited by their treatment of cavity regions; i.e., air, outside the pressure vessel wall.

TransWare Enterprises, under the sponsorship of EPRI and BWRVIP, has developed an advanced three-dimensional transport methodology capable of producing fully converged flux solutions throughout the entire reactor system, including the cavity region and primary shield structures. This methodology provides an accurate and reliable determination of through-wall fluence in boiling water reactors and pressurized water reactor pressure vessels, thus allowing the dpa method to become -- to be implemented with high reliability. Using this advanced 3-D methodology, this paper presents comparisons of the generic and dpa attenuation methods at critical locations in both BWR and PWR pressure

vessel walls. See Comparison of Regulatory Guide 1.99, Fluence Attenuation Methods, April 2012, Journal of ASTM International, 9(4):104028.

Thus Petitioners aver here that the NRC should require its licensees to use the above described dpa method to more accurately represent the fluence attenuation through the reactor pressure vessel wall at all elevations of the pressurized reactor vessel because it accounts for neutron streaming in the cavity region and therefore provides more accurate and more meaningful data to the NRC about the degree of reactor vessel embrittlement due to the damage sustained from neutron fluence.

Conclusion. For all the above-stated reasons the NRC should take the requested enforcement action against its licensees as requested above and as requested in the earlier 2.206 petitions to protect the health and safety of the public and to protect the environment. Petitioners once again urge the NRC to issue a confirmatory order to all PRV licensees requiring the immediate shut down of all pressurized nuclear reactors which are currently operating in extended power operation in America.

That completes my dissertation. I'll be open to any questions that anyone might have.

MR. BOWMAN: Okay. Yeah, this is Greg Bowman, the PRB Chair. I would ask -- we're hearing a lot of background noise, and so if you're on the line and not speaking, if you'd please mute yourself, that would help cut down some of the distraction.

So, thank you, Mr. Saporito, for your presentation. I know it's been a little bit over on time, but we definitely appreciate hearing your perspectives. I'll note -- you went through the supplement, but I'll note that we just kind of received it this morning. I don't believe any of us had a chance to really kind of review and digest it, but we will certainly do so as part of our deliberations. I'll also offer that we'll share the information related to the petition, including the transcript of this meeting when it's ready, to the Inspector General as you requested. So thank you again.

And with that, I'll turn things back over to Rob, our petition manager, to get into the Q&A.

MR. KUNTZ: Great. Thanks, Greg.

This is Rob Kuntz with the Nuclear Regulatory Commission. And as we stated at the opening we will now enter the question and answer phase of the meeting.

So at this time does anyone on the PRB have any questions for Mr. Saporito?

Okay. Hearing none, I'll ask now if anyone from the Licensee, Energy Harbor, has any questions for the PRB related to the issues raised in the petition?

Okay. Hearing none, I'll ask the Petitioner or the Licensee if they have any questions for the NRC staff about the 2.206 petition process.

Okay. So before I conclude the meeting, at this time, any members of the public may provide feedback regarding the 2.206 petition process. However, as stated at the opening, the purpose of this meeting is not to provide an opportunity for the Petitioner or public to question or examine the PRB regarding the merits of the petition request.

So at this point are there any members of the public that would like to ask any questions of the NRC staff related to the 2.206 process?

Okay. Hearing none, before we complete does the court reporter need any additional information for the meeting transcript?

Okay. I don't hear anything.

(Simultaneous speaking.)

MR. KUNTZ: Yes, go ahead.

COURT REPORTER: Yes. I'm sorry, sir. I needed to get off mute. I was hoping you could spell On Yee, Mr. Hipo Gonzalez, and Jenny Tobin's names.

MR. YEE: This is On Yee. The first name is spelled O-N. Last name is spelled Y-E-E.

And for Hipo Gonzalez, his first name is spelled H-I-P-O. And last name is spelled G-O-N-Z-A-L-E-Z.

MR. KUNTZ: Jenny, can you provide --

MR. YEE: And Jenny Tobin is Jenny, and the last name is spelled T-O-B-I-N.

COURT REPORTER: Okay. Thank you very much.

MR. KUNTZ: Okay. Was that all you needed?

COURT REPORTER: Yes, sir. That is all the questions I could think of.

MR. KUNTZ: Great. Thank you.

So the NRC, we want to encourage the participants outside the NRC to provide public meeting feedback to the NRC via the NRC public meeting website or you could provide it to me. My name is Robert Kuntz. And you can provide that at robert.kuntz@nrc.gov.

Okay. So with that, this meeting is

concluded and we'll be terminating the phone connection. Thank you.

(Whereupon, the above-entitled matter went off the record at 11:39 a.m.)