ADVISORY COUNCIL ON

RADIATION PROTECTION

CERTIFIED ORIGINAL

Bureau of Radiation Control

Hampton Inn & Suites

Tampa Airport Avion Park Westshore

Tampa, Florida 33607

Thursday, May 9, 2024

10 a.m. - 3:10 p.m.

Reported by
Rita G. Meyer, RDR, CRR, CRC
Realtime Reporter and Notary Public
State of Florida at Large

ADVISORY COUNCIL MEMBERS PRESENT:

Mark S. Seddon, M.P., DABR, DABMP (Vice-Chairman)
Nicholas Plaxton, M.D.
Adam Weaver, MS, CHP
Joseph Danek, CHP
William W. Atherton, DC, DACBR, CCSP
Kathleen Drotar, Ph.D., M.Ed., RT. (R)(N)(T)
Albert Tineo, MS, CNMT
Luis A. Rodriguez Anaya, DPM

FLORIDA DEPARTMENT OF HEALTH STAFF
BUREAU OF RADIATION CONTROL:

James Futch, Environmental Administrator
Clark Eldredge, Bureau Chief
Kevin Kunder, CNMT, RT(N), Administrator
Camilla Guy, Environmental Specialist
John Williamson, Environmental Administrator
Jason Nicholson, Environmental Manager

GUEST SPEAKER:

Javier Torres-Roca, M.D., Moffitt Cancer Center

AGENDA

MARK SEDDON: Welcome, folks. Appreciate everyone coming. And we want to start on time. Close to it. Not too far. So expecting one additional individual to come in about thirty minutes, so let's go ahead and we want to start at this end or with introductions.

Luis, do you want to start?

LUIS RODRIGUEZ: I'm Luis Rodriguez, a podiatrist in south Florida.

ALBERT TINEO: Albert Tineo from Halifax Health, Daytona Beach.

JASON NICHOLSON: Jason from the BRC.

KEVIN KUNDER: Kevin Kunder, Tallahassee administrator for radioactive materials.

JOHN WILLIAMSON: John Williamson, environmental administrator. Environmental in Orlando.

JAMES FUTCH: James Futch, technology administrator out of Tallahassee, Bureau of Radiation Control.

MARK SEDDON: Mark Seddon, medical physicist out of Orlando, Advent Health.

CLARK ELDREDGE: Clark Eldredge, bureau chief for Department of Radiation Control, Tallahassee.

CAMILLA GUY: Camilla Guy, environmental

specialist, Radiation Control in Tallahassee.

WILLIAM ATHERTON: Bill Atherton. I'm a chiropractic radiologist in private practice, Miami, Florida.

JOSEPH DANEK: Joe Danek. I'm retired, but I worked for Florida Power and Light, NextEra Energy in their nuclear power program, power plant

ADAM WEAVER: I'm Adam Weaver, the RSO LSO and other stuff at University of South Florida.

NICHOLAS PLAXTON: I'm Nicholas Plaxton, nuclear medicine physician at Bay Pines VA.

JAMES FUTCH: We also have one guest who's seated at the back, Mark Wroblewski. Rita, we'll get that to you.

Mark is a former council member in the basic x-ray machine operator position and he's thinking about perhaps coming back again, since that position is still vacant. I don't know if -- do you want say anything about yourself, Mark.

MARK WROBLEWSKI: Well, no. Just hi everybody. We're trying to make sure that I can be a board member now that I'm also employed by the Florida Department of Health. And so, there's -- there could be a conflict there. We want to make sure that there isn't.

MARK SEDDON: Okay. Welcome. Thank you. All right. Very good. Thank you so much. Appreciate everyone's introductions and then I think Kathy will be coming in thirty minutes or so.

And so, James does now have the official lunch order form.

JAMES FUTCH: Yes, we do.

MARK SEDDON: So that's the first, most important order of business because apparently, lunch is going to be a challenge today because it's a very full house for the facilities.

Everyone should've received a copy of the minutes via e-mail from Brenda. A copy are here for review if you have any questions or comments.

Are there any, any comments or corrections that were not forwarded to Brenda in advance of the meeting? If not, can I have a motion to approve the minutes as previously submitted?

ALBERT TINEO: So moved.

MARK SEDDON: Can I have a second?

LUIS RODRIGUEZ: Second.

MARK SEDDON: All in favor?

COUNCIL MEMBERS: Aye.

MARK SEDDON: Any nays?

(No response)

MARK SEDDON: Minutes are approved.

All right. Well, we'll jump over to our Bureau update from Sir Clark Eldredge.

CLARK ELDREDGE: All right. As you may have heard, I'm now the official Bureau Chief after spending 13 months as the interim -- 15 months as the interim.

As far as other personnel issues, we've been averaging between -- we've had between eight and eleven vacancies over the last, since the last meeting in the bureau. Hiring has not been quite as challenging as before, but some of it's been due to internal stealing from each other, you know, but we've actually been getting a few -- usually just one, at least qualified person applying for jobs these days when previously it was -- you had to advertise, we'd advertise multiple times with no qualified candidates.

One note for the -- for us as well as for the state generally, we do have two national meetings coming up. The conference radiation program conference director's meeting starts next weekend in Jacksonville and is there for a week. This is the group of all the state programs. It's a group of state programs and we -- they -- the group, itself,

does things like develop model state regulations for states to adopt; they liaison, represent states in front of national and international bodies. They have, you know, representatives with IAEA, NRC and we have official liaisons with NRC and -- they have official liaisons with DOE, FDA, et cetera.

Then, of course, I'm sure most of you already heard the HPS IRPA meetings are going to be the second week in July in Orlando. So the Florida chapter HPS will be involved with that as well as are own agency has been asked to assist and present some things. So Mr. Williamson is going to have the joy of sweltering in the summer heat there as they display some of our emergency response equipment.

The Orlando group just went through an audit of their power plant surveillance program. Do you want to talk about that a little bit, John?

JOHN WILLIAMSON: Crystal River and St. Lucie nuclear power plants sent a representative audit environmental, radiological environmental monitoring program. Just for information purposes, there's statutory authority for the Bureau to, to do environmental sampling around the nuclear power plants, so along with that statutory authority back in the very beginning, Turkey Point went online,

even before that, in 1965, FPL decided that if they had to pay the department to do monitoring, they might as well pay the department to do all the monitoring that was necessary required by the NRC. That's the radiological environmental monitoring program, REMP.

So on a periodic basis, the utility, as part of their NRC license, they audit our program to make sure that everything we're doing is in compliance with the NRC. And the NRC audits the utility, which of course they do every two years or so in the monitoring program.

So last month, I believe, the utilities, Crystal River and St. Lucie, sent representatives. They looked over the means by which we collect samples, how we analyze them, our record keeping process, how we produced data in the quarterly reports in the course of the utilities and they found no issues on what we do. They actually liked some things in particular.

We do have a lot of the turnover in the laboratory, but we do have a good process for training new chemists coming in. It also goes without mentioning the pay raises for the chemists, which we were able to implement last year

across-the-board to the chemists, really helped in trying to make sure that we keep these people.

For our chemistry staff, we have three Ph.Ds out of five chemists on the staff, which is the greatest number we've ever had working in the laboratory. And all of these persons, some of them have been there a very long time, twenty plus years. The supervisor is a Ph.D. chemist. And then the young person, young chemist, we have a young chemist is a Ph.D. as well. Hopefully we can keep them all for a while and maintain that type of excellency that we keep in the monitoring program.

JAMES FUTCH: I've got a question. So how many other states have radio chemistry labs, if you know?

JOHN WILLIAMSON: I don't know specifically. It turns out that in general, most radiation control programs are divorced from their radio chemistry lab. The radio chemistry lab, if they have it, is under the Bureau of Laboratories, a completely separate division. I personally, having been in two programs that were associated with the Bureau, and seeing what happened when you pull it away, you kind of lose control over the quality aspects of the laboratory if the people collecting the samples aren't with the same group that's analyzing the

samples. There's a lack of accountability on the laboratory when they don't have to report back to the people who are responsible for maintaining the environmental monitoring program.

There are total, there's probably only ten or so radiation control programs that I know of that have their own laboratories associated with the Bureau. Most of the rest of them, as I said, are separated and for the most part, only states that have nuclear power plants have well funded, routinely inspected radiation control laboratories and we'll actually see that in one of the presentations later.

JOSEPH DANEK: Nice job. Inspection of the plants. Good job.

CLARK ELDREDGE: Putting it out there, talking to CRCPD, maybe they ought to suggest to come up with a guide, the state RAD program should have control over the state radiation lab if there isn't one now. Might be a good recommendation.

A budget update for the Bureau. Next year, we're losing a quarter of our expense budget. Mind you, it was a little fat due to the fact that we had the remote offices. We used to have -- we have six field -- five field offices, six field offices

around the state. We cut it down to four and then we had people working from their home, so there was a bunch of overhead for rent and electricity things like that which we don't have anymore. We're not sure yet how that's going to impact our future abilities at this point.

Other than that, it's the time of year where they're telling us to start preparing our legislative proposals. So this actually changes to our statutes, so advisers, if you all think of anything, please submit it where you think we need to look into additional authorities and stuff, please let us know and we can bring it back to the council in the future, how we work it.

So, all right. Anything else in my notes? Other than generally, folks, I've got, you know, no real problem areas at this point within the Bureau. Things are doing well. Your last time, we did well during our IMPEP and things are going well at the lab. We are short in the calibration group right now. We've had some key personnel retire. We are getting a little gray in the hair across leadership of the Bureau, but that's kind of natural. And we will -- but the division's actually taking some stuff to look at -- to look at, sorry. My brain's

drawing a blank on the two bit word for making sure you have people to take over in the future when people retire.

JAMES FUTCH: Succession.

ADAM WEAVER: Contingency.

CLARK ELDREDGE: Succession planning, thank you. So the division is working to have us do -- working through succession planning exercises.

All right. That's it for the Bureau updates.

MARK SEDDON: Quick question. I know earlier this year there was some changes suggested for licensure. House/Senate bill --

CLARK ELDREDGE: He has an update.

JAMES FUTCH: I have an update. My section. If we keep to the schedule, I may do it before lunch.

MARK SEDDON: Okay. Very good. Any questions for Clark? All right. Thank you, Clark. Appreciate that.

I guess we jump over to John.

JOHN WILLIAMSON: So this is actually the same talk I'm going to give next week at the Florida Association for Food Protection at the annual conference. So this starts as many things do. I got an e-mail from the chair of this group asking

whether I'd be prepared to come and give a talk about food safety and radiation. And she said, John Richards with the EPA recommended you. And I'm thinking, John Richards. You know, the next time I see him, I'm going to burn your car because I really didn't need to do this. So this is what happens when you know somebody professionally and they say that because of budget issues, they can't do it. And you're not there to dispute it, so they say, but this guy will be happy to do it for you, so getting what they actually wanted is a little harder on determining.

So let's just start with some basics. Most of us are aware that there is some naturally occurring radiation in food. Bananas, for instance, 15 becquerels per banana. Milk, 44 becquerels per liter. Brazil nuts are high in Potassium-40 and Radium-226. It's gotten to the point where there are some health physicists who have even created a term called the banana equivalent dose, which is equivalent how many bananas you can eat in a particular day.

We do have radioactive material naturally in our bodies at pretty much a steady state. Just because you eat one banana doesn't mean you're

increasing your radioactive content because you're excreting out previous stuff. So it stays, in essence, it's actually required because you can't get rid of potassium in your body and one-tenth of one percent of all potassium is radioactive Potassium-40, with a half life of 1.2 billion years, so it's not going anywhere any time soon.

What does this mean? It means we are actually radioactive and we expose ourselves and others to radiation. If you want to minimize the amount of radiation that you're exposed to, never sleep in the same bed with somebody else. You could stop eating too, but that has a little more, you know, terminal ends to it.

Some of the natural radioactivity that we find in the body, obviously, uranium, thorium, Potassium-40. Uranium-238 has a half life of 4.6 billion years. It's going to be around a while. Thorium, half-life in the billions of years. Potassium-40, 1.2 billion years. Radium-226, 1600 years. All these are in the natural decay chains. Carbon-14 is produced in the upper atmosphere and is naturally incorporated into our body, along with all the other carbon. Tritium is incorporated in water. Produced by cosmic ray spallation in the upper

atmosphere and then it comes down as water and then we drink water. It's naturally incorporated in us and it's also created through the nuclear power process and that creates small amounts in the environment.

And then Polonium-210, which is one of the decay products in the uranium chain. Smokers, in particular, have a lot of polonium in their body.

There's many sources of radiation in the environment. There's the primordial, that's been here since the earth was formed. It's given off by the breakdown of rare radioactive elements. Uranium, thorium and Potassium-40, all very, very long half lives.

Cosmogenic, as I mentioned, made when particles hit gasses in the upper atmosphere, creates Carbon-14, tritium, Sodium-22. Man made. Nuclear weapons fallout, nuclear power plant accidents and nuclear power plant operation does contribute very small amounts of it.

Short-lived isotopes we're really concerned about would include Iodine-131. Exposure from iodine can result in thyroid cancers, longer-lived isotopes, Cesium-137, Strontium-90 in particular forms. Nuclear power plant accidents, in

particular, produce a lot of those and there's still some of those remaining in the environment from power plant accidents and nuclear testing.

Where can we get contamination in the environment of radioactive materials? Well, nuclear explosion.

(Dr. Drotar Enters Meeting)

JOHN WILLIAMSON: Above-ground testing back in the 50s produced a lot of nuclear explosions. A lot of contamination in the environment. Nuclear power plant accidents. Three Mile Island produced very small amounts. Chernobyl produced very large amounts. And Fukushima produced amounts smaller than Chernobyl, but larger than Three Mile Island.

There's also possibilities of a radioactive dispersal device, somebody deliberately introducing radioactive material. Cesium137 is the form most used, which is a salt easily disbursable and dissolvable in water. Somebody can load that into a cropduster and spray it on fields. Type of a radioactive disbursement. You could have a dirty bomb.

Another type of radioactive disbursal device where you strap explosives to, you know, something containing radioactive materials and you blow it up

and then disburses the material.

Probably the biggest hazard, immediate hazard there is the explosion harming or killing members of the public, but it also produces radioactive material that would be disbursed and that's primarily a public relations issue. The actual danger from that is not much, but public perception of radiation is that any radiation is deadly. So you're going to get into these clean up issues when you need to have massive clean up to clean up the low background before anyone is ever comfortable going back in those areas.

Other possibilities are rather remote. A launch anomaly. And NASA used the terminology because if they say explosion or accident, that has bad connotations, so a launch anomaly involving the launch of radioisotopic thermal electric generator. These are the power sources they use on deep space probes and also on the rovers we've sent to Mars. There were these types of things we used back with the Voyager back in the 1970s which are still working their way beyond the solar system. They were also used on Ulysses, Casini, Galileo, Pluto New Horizons, the Mars science lab and the March 2020 launch. All of those had radioisotopic thermal

electric generators which are powered by Radium -- well, Plutonium-238 has an alpha emission. That alpha emission is set up to create heat via a thermal couple, which produces electricity.

Obviously, if these things were on board the spacecraft and the spacecraft blows up on launch, it is a possibility that you could have dispersal of the Plutonium-238, which would be contamination of the environment, which we'd have to worry about in the food. And it's primarily citrus, but Viera in Brevard County, which is about twenty miles away from the launch, does have a lot of crops, green vegetables growing in that area, which we can potentially contaminate.

You can have an industrial accident. If you had some type of nuclear medicine facility that had a large industrial accident, it could disburse short-lived nuclear medicine isotopes.

There was, as I mentioned earlier, there was a large amount of above-ground testing of nuclear weapons sent back in the 1950s and 1960s. This resulted in considerable exposure to the people downwind of the explosion. These people were called down winders. Cesium-137 and Strontium-90 were two of the isotopes really of concern for long-term

radiation exposure in the environment because they have half lives of about thirty years. So typically, we looked at ten half lives before we were no longer concerned. So if an explosion took place and it disbursed those two radioisotopes in the environment, so on the order of 300 years before they decayed out enough they're no longer of concern.

The more immediate concern was Iodine-131, which has a half life of eight days and it gives an extreme dose very early on. There are people affected in islands known to cause thyroid cancers.

Because of the Cesium and the Strontium in the environment, particularly affecting infants through the ingestion of milk products, the U.S. and the USSR signed a nuclear test ban treaty in 1963 which banned atmospheric testing. And since then, we've actually seen a decrease in the amount of Strontium-90 and Cesium-137 in the environment.

Amazingly, here we are nearly fifty years later and we can still clearly see Cesium-137 in the environment attributable to nuclear explosions in the atmosphere.

Unfortunately, when we talk about the type of monitoring that we do for food, it's really, really

minimal. We monitor around the nuclear power plants because it's required by the Nuclear Regulatory Commission's requirements. Turkey Point, sugar cane, potatoes, corn and goat's milk. Except for goat's milk, these are only done once a year. St. Lucie, citrus and Levy, produce, if it's available, which for many years, which it has not been. Crystal River, citrus, watermelon and milk done on a quarterly basis. Citrus and watermelon are only done on an annual basis. It's not an awful lot of testing if you're looking for somebody who's trying to put material out there and they're not telling you that they're putting the stuff out there.

Really, environmental monitoring really serves as the trip wire. We're not doing this because we think something is out there. We're really doing it because it's required. But if something is detected, maybe that's the sign that somebody released something out there on a deliberate basis.

We do continuous air monitoring that are collected weekly around each of the power plants. So technically, those could serve as a trip wire because we analyze those and we can be looking for large amounts of radioactive material found on the filters or in the ion cartridges.

The broad leaf vegetation we do are only collected monthly. So you could technically have six to seven weeks between collections on there before you might be able to detect somebody had actually had a release. And thermal luminescent dosimetry, looking at the gamma dose levels in the environment, that's collected on a quarterly basis, so that's typically 90 to 110 days between collections. It's not an awful lot of frequency to make the determination whether somebody is releasing material out there intending to poison or harm the public by contaminating the food supplies.

There is the U.S. Environmental Protection Agency RadNet program, which is a nationwide program which has monitors, and there's 140 monitors. But if you consider the size of the nation, or even the size of the State of Florida, there's only five monitors in the entire State of Florida. One in Miami, Tallahassee, Tampa, Orlando, Jacksonville.

So you're trying to say you're covering the entire state by virtue of having five monitors. They do have continuous monitors and they're actually hooked up to a continuous monitoring network, so if one of the monitors does detect higher levels of radiation, the EPA will know about

it because alarms go off. They're monitored, you know, on a continuous basis. They actually have specialists who go through and look at the data they produce by these.

So if there's an accident, say for instance, a nuclear power plant accident, we do have very clear guidance on what we're going to be doing. The first part is we're going to do everything possible to make sure we protect the public from unnecessary exposure of radioactive material.

So what do we do? We recommend store food and feed. Feed and water for grazing animals within ten miles of the event. Meaning if an event is at the nuclear power plant, in that ten-mile EPZ circle, we're going to make recommendations any grazing animal in that, cows, goats, any other private stock animals, they're put on stored feed and water, and that, if possible, you bring them indoors and away so that they don't have contamination in their outer skin.

We'll recommend food embargo quarantines in downwind sectors out fifty miles; further if necessary. We coordinate with Florida Department of Agriculture and local law enforcement to enforce those embargoes. So we're essentially putting a cap

there's not going to be any food movement out of those areas downwind, fifty-mile distance to try and protect you.

This doesn't just protect the citizens of the State of Florida. We're hopefully taking actions that will actually protect industry, the entire agriculture industry, from being blackballed nationwide and being unable to sell anything. If they see you're doing -- you actually have an active means of protecting, determining if there is contamination, then the other areas you can still have an active thing. Whether that's actually going to be true, considering the public's hysteria about radiation, that might be questionable.

Other actions we can take, nuclear power plant action, for instance, we can request assistance from FRMAC and the Southern Mutual Radiological Assistance Program sends out additional field teams to help us do sampling of food products. We can work with local agriculture agents to determine where the likely food crops that are in, out in the field now.

One thing that isn't -- that many people don't know, the Bureau doesn't have records of what's grown everywhere. We don't know where these things

are. Even the state Department of Agriculture doesn't know every single area. The local agriculture agents, on the other hand, usually are well versed in knowing what crops are out in the field; what's getting ready to come in and what is in all the various places around the state. So you need to get those kind of people involved when you're doing these protective actions.

JAMES FUTCH: One question for you. When you talk about the local agriculture agents, are those county employees?

JOHN WILLIAMSON: Yes, they're usually part of the county. Usually part of the county like the UF --

JAMES FUTCH: UF, county extension departments.

JOHN WILLIAMSON: Yeah, county extension agents.

We can also request the U.S. Department of Agriculture, that's the DOE, the aerial measurement system overflights to determine deposition.

Typically, when you go to DOE, you only have two sites. They have a group at Andrews Combined Joint Air Base in Washington, D.C. and they have a group at Nellis Air Force Base out near Las Vegas. Fortunately, however, DOE Region III based in

Savannah River site, has the capability to do AMS as well, which means that we've cut the distance and the time that it takes for a deployment to about a third of what it takes Andrews. For instance, the best AMS flights are run off of helicopter, so if you're having to fly from Andrews Joint Base in Washington, D.C., to St. Lucie, for instance, versus Savannah River site flying a helicopter to there, it's a much shorter distance. So those in DOE Region III have much faster response capabilities.

And even more so, DOE Region III has a contract with the Coast Guard flying out of Cecil Air Field south of Jacksonville to use their fixed wing planes, which means that, once again, in Florida, we are fortunate we have resources that are much closer. And being closer, they can get in the air much faster and start making these assessments.

Yes?

JAMES FUTCH: John, I wanted to add one thing to that. In addition to that, those DOE assets from Savannah River actually train in Florida annually, at that site in Cecil Field, and we've had occasion with some of our state assets to work with them, so they actually know a lot of the geography in at least the northern half of the State of Florida

already, because we've actually flown with them.

JOHN WILLIAMSON: The ingestion planning zone I mentioned, we do protective actions down to, fifty miles downwind from where the site of it is. So we're looking at everything that takes place in that 50 mile downwind. And we are really counting on getting assistance from the local agriculture agents, or the county tax collectors. You know, obviously, county tax collectors are looking at property and every single property is categorized for what it's used for, right? So nobody's going to have a commercial farm unless the county knows they're having a commercial farm. One, there's a tax benefit of having it as agriculture versus commercial property. So that's one of the important things is being able, when you look at your ingestion planning zones, knowing who to contact to get the information so that you can send people out there to do your sampling.

The FRMAC, Federal Radiological Monitoring and Assessment Center, is the chief U.S. government agency organization to assist with radiological emergencies. So the resources available, they have monitoring teams with dosimetry instrumentation, communications and transportation. They start

really by getting you deployment out of your local radiological assistance program, which for us is Region III, the Savannah River site. They have about a six-hour timeframe, six to eight hours to respond to an accident in the State of Florida. They are two hours in wheels up from their site. So they could technically be on site as fast as six hours assisting the Bureau of Radiation Control with doing response for an event.

FRMAC also has fixed and mobile labs for sample analysis. Their mobile lab is what they call a fly away lab. They use lightweight equipment that can be put into aircraft and flown wherever it needs to go. Their fly away labs typically have about a 24-hour response time. Their fixed labs, they use the fixed labs at this -- the national laboratories closest, which is the Savannah River site and actually Oakridge. Pantex out in Texas. Lawrence Livermore, Los Alamos, Panther site and Washington, D.C. those are all fixed labs that can be brought in to assist to do a sample analysis.

They have a NARAC, national atmospheric -- national atmospheric radiologic assessment center which is located out in Berkeley, which provides the ability to take radiologic -- to make radiological

dispersion plots.

You can actually make a phone to call them and tell them the accident scenarios that happened. They can put it into their computers and they can determine where the likely contamination is going to be. They also have consequence management home team support, which they run out of Las Vegas. These are people you can call on the telephone and get assistance with predicting what type of accident, what the accident conditions are and getting you recommendations for what protective actions you need to make.

FRMAC assets, as I mentioned earlier, helicopter and fixed wing aircraft to measure ground deposition and plume tracking. They have a federal advisory team for Environment Food and Health, which is the A Team. These are experts from the EPA, the CDC, the Food and Drug Administration and the U.S. Department of Agriculture that can help you determine what protective actions might be necessary to make sure the public is not unduly exposed to radiation.

Then you have state monitoring teams and radiation, mobile radiation labs that integrate with FRMAC. So we take our field teams, we're expected

to be able to hold the fort down from anywhere from 24 to 72 hours and then as FRMAC brings their teams in, we integrate with them to make -- to continue our monitoring with larger efforts.

County responsibilities, I have already mentioned we're looking at the local ag agents. These are some of the things we necessarily need them to do for us. We can't do this kind of work. We only have about 70 professional personnel. Our job is to collect samples, not to maintain a list of where everything is.

So what the counties need to do, maintain lists of the farmers, dairies, water supplies, slaughter houses, seafood dealers, groves, food processors, produce county maps, knowledge where it's grown. This should be the local ag agents, helping collecting samples if necessary.

We go out there, agriculture agents are well known to the farmers that are out there. If the ag agent goes out and starts collecting something in the field, the farmer already knows who he is. He's not going to shoot him. If we go out there and start collecting, they think we're stealing their food, their commercial product, and we might very well have law enforcement issues. So making sure we

get those ag agents to help us out.

Coordinate help from the radio amateur -- this is the RACES people. These are amateurs that use ham radios. When you start getting far enough out, unless you have satellite radios or some type of monitored radio system that can cover statewide, you may have difficult talking to each other. Pretty much your cell phone networks are obviously going to be jammed with everybody making calls to everybody else. So RACES is, the ham radio operators are a resource we've used in past years to aid us with communications.

Things that we require the state to do. State Department of Agriculture maintains a list of the same things as possible. The one thing the state does and the county doesn't, provide decision makers. These are the people that can actually make the decision to enforce an embargo. The Governor has the right to make emergency declarations, which gives him the right and he delegates it down to people at the Division of Emergency Management, to make the type of decisions on embargoing food from the, you know, from a particular area or closing roads or enforcing quarantine food from areas.

Other things we need the state to do, provide

additional field vehicles, if necessary. Coordinate law enforcement activity and release public information and rumor control. Most of all, it's the state's responsibility to ensure public health and safety in an emergency.

Additional actions that need to be taken. Notifying the food processors. If there's an event, if it's not an obvious one, like a nuclear power plant accident, if it's a radiation disbursement, we make a determination that some malicious agent did this, we're going to have to make notifications to the food processors so that they don't bring food in that was contaminated and contaminate their equipment as well. It's bad enough that something out in the field is contaminated, but when you bring it in and you contaminate the food processing equipment, I mean, that's how we get e-coli outbreaks. The food processing gets contaminated and it spreads to food that was not originally contaminated.

Initiate your food control strategies. How do you control this event and make sure it doesn't get worse than what you started with? Release timely and clear public information. You can't hide this occurring. Believe me, the first time that you do

this, it's going to hang you out to dry. And we know if you're a food processor and you tell your employees, we need to shut this down, there's been an event and they ask questions on the event and the first call they're going to make to their spouse is, this just happened. Don't go buy any food. And it's going to get out to the public really quick and it's going to look like you were hiding if you don't have clear public information was released. And then you're going to have to make decisions, if you have widespread contamination events, those farmers, they have to go in and treat, you know, take care of their, their animals.

You're going to have to make a determination whether it's safe for them to go in, whether you can provide escorts to them to get in, because there's going to be other people who are claiming that they have property in there who don't. Who are trying to get in there for malicious reasons on their own, whether it's looting or some other reason. So you need to make sure you have law enforcement coordinate with all that type of stuff as well.

Some of the really bad parts about this. Coordinating how to destroy, dispose of embargoed food, milk or animals. If you have a -- if you're

cows, say you have beef cattle and they eat contaminated feed, is the public ever going to accept beef from that cattle? You know, if it's iodine, which they have an eight-day half life, you can wait it out. But if it's particulates, Cesium or Strontium, thirty year half lives, what are you going to do with those cows? Are you going to dig a hole in the ground and kill the cows and bury them there? That's one possibility.

The U.S. Department of Agriculture has essentially a portable furnace that they have. They can put entire cows in it and basically take them down to ash and then you have a much smaller amount of material to have to worry about. That's all something that you need to consider. What do you do with, say, 20,000 gallons of milk that's contaminated with radioactive material?

Suppose you manage to protect the cows initially, but you need uncontaminated food or water to serve them. Well, these are actions that the farmers may not have the capability of taking care of those things, themselves. The state needs to be prepared to assist the farmers with those things.

Sample/recommend embargo of wild game, migratory animal consumption. Wild animals don't

know that there's been an accident. They don't know there's an embargo. Especially if you're looking at wild fowl. They just -- they eat what they want and then they fly to the next area.

Well, you can get significant body burns if these animals are consuming contaminated feed and going to other areas where they're taken by hunters. So you need to have some means of determining how you going to protect your hunters and other people who consume wild game, migratory animals.

Ingestion pathway protective actions. These are the actions we take to limit the amount of radioactive material that people are being exposed to, either in human food or in animal feed going through the animal to human pathway. We can take these prior to or after we know that the contamination has occurred.

There's an expression called the derived intervention level determined by the Food and Drug Administration. It's the amount of material that can be in food that's actually safe for human consumption. Again, we get down to the question, is there any level which the public is going to consider safe for human consumption? And if it's certain radionuclides, the public may very well say

that no, no level is safe. But that's why the slides, like I showed initially where we talked about there is natural radiation in food. And whether it's one type of radiation or another, radiation is in the end, radiation. So there are safe levels of radiation in food. Perhaps we'll be able to get that over to the public. But if not, we have to be prepared to take actions on that.

So it is very, very clear that from a true risk perspective, there are safe levels of radiation in food and as long as the radiation levels are below those preassigned levels, it is safe to consume that food, okay?

So some of the protective actions. For milk, for instance, you can remove the lactating animals from the pasture. Put them in under covered areas. Stored food, grain. You can withhold contaminated milk, where you might have 20, 30, 40, 50, 100,000, 200,000 million gallons of contaminated milk.

You can store the contaminated milk to allow decay. If you're looking at Iodine-131, eight-day half life, can you store it long enough? That's 80 days where you don't have to worry about it. You could go in to do the preserve milk types or, you know, turn it into powdered milk and you could hold

it long enough.

In this country, because we have such a food surplus, it probably won't happen. In other countries where they don't have food surpluses, things like that will probably end up having to occur.

Fruits and vegetables, you can preserve -- remove it by washing the surface. You can also preserve it. Essentially let it go through the half-life decay until there's no radioactive materials left.

Meat and meat products. Place animals on uncontaminated food and water. Poultry products, you can monitor it. Soils, idle or remove the soils. Scrape the top layer in a widespread thing. That's what they're doing in Fukushima. They're removing the top lawyer of soil from hundreds of square miles.

You can also do deep plowing. You can do liming, which absorbs radioactive material and then remove the liming. Grains, mill or polish it to remove contamination on the outside. Water, monitor. Cover open wells. Shut off contaminated sources.

Food and shellfish, food move. Fish move. All

you can have is monitoring programs. You can't tell fish there's an embargo going on. You can't do anything.

Things like honey. All you can do is monitor because you don't know where those bees actually got their pollen from. Home gardens, recommend that the owner stop consumption until their crops can be tested.

So the protective action guides issued by the Food and Drug Administration. The whole body, 500 millirem. Any organ, 5000 millirem dose.

The DIL is defined as the amount of contaminated food that you can eat in the space of one year that would give what that dose is. It is important that each radionuclide and the DIL are applied independently from other nuclides.

So it's 500 millirem for Cesium, 500 millirem for Strontium, 500 millirem for Plutonium and so on.

The DILs include percentages of the type of foods going to be in the diet, the amount of the food typically eaten, the length of time a person may be expected to eat it and the potential exposure to contaminated foods of different members of the population. Even with children, it's different pathways.

We actually have a calculation spreadsheet that we can use to calculate whether food exceeds the DIL values. And it's simply, we count food on our gamma detectors, looking for the amount of radiation by the various isotopes in that food and we plug it into the spreadsheet and it spits out whatever portion of the DIL it is.

We can actually even calculate DILS by measuring the concentration of radionuclides in the soil. We can actually go out there, collect the, say a one liter container of soil, bring it back to the laboratory, analyze it and then plug those radionuclide concentrations in and it will make estimates on whether that is going to exceed the DILS. If it does exceed the DILS, then you start your embargo process, of course.

For years, there was no PAGs for drinking water. We were expected to use the same standards of drinking water uses on a day-to-day basis. In 2017, the EPA finally released a single PAG, using the same values as the DILS. 500 millirem of total dose in the space of one year.

Those are much higher than the normal levels. For instance, the EPA values for normal drinking water is about 4 millirem in any one year. And

that's looking at -- that's determined to be that low because they expect you to get 4 millirem for a fifty-year period. A DIL is 500 millirem expected that you only get for one year.

So when have we ever used DILS? Well, because of the Fukushima accident, the EPA used DILS based on looking at the analysis of 1749 imported and domestic samples of contamination from Fukushima. Of those 1749, only three of them were found to contain any detectable levels of radionuclides and these were well below the established DILS.

A more incident specific, when we launched Mars science laboratory, NASA and the BRC requested guidance from the FDA on specific DIL for spinach because it was not listed in the FDA guidance, and we knew that that was the target of opportunity in case there was an anomaly of that launch. And we were able to get one and we were able to use, if necessary.

That was Plutonium-238 for leafy produce, specifically green vegetables, green spinach. And the reason is because the Viera farms, which I mentioned earlier, which are about 15-20 miles away from the NASA facility. That is one of the things that the Viera farm produces a lot of.

Imported food security. The FDA worked to get the Health Security and Bioterrorism Preparedness and Response Act of 2002. This was in response to 911 when we look at the whole security issues. And it basically said that we had a way of protecting the United States from food being brought in from outside that might be contaminated.

The FDA conducts inspections and they collect and analyze samples and they oversee the importation of a whole variety of different types of food. Now, if you consider the amount of food that's actually imported in this country, I want you to think about there's a single agency with one laboratory doing the testing. How much food is actually tested?

So they actually do a targeted response where they test food that is more likely to have had issues, i.e., if there was some type of an issue. Fukushima, obviously, was of great interest to them because of the accident. They also used the Customs and Border protection, who has large border monitors. They can actually test entire sea lane containers looking for radioactive material in bulk. If you have a large amount of contaminated food in bulk, you have a better chance of that being -- passing through one thing of grapes or something

that's contaminated.

Those large yellow things are the portal monitors. That's what US CBP, the Customs Border Protection uses to screen for food coming in.

FDA has a food emergency network, which is their network of looking at contamination and how they detect it in the food.

FDA has one laboratory in Winchester, Massachusetts. They actually do analytical testing on food products. They work with other teams, including state and local laboratories who are part of this network. And then FDA also works with the other people, the EPA team, the advisory team, food health and environment, if there is an event, on what to do about it and how to protect the public.

FERN, Food Emergency Response Network, is that FDA program, which actually is a consortium of the FDA laboratory, which is the state and local labs to actually be able to do food testing. The Bureau participates in the FERN testing program, and this is samples and reaction taken in the laboratory. And one thing, only the tomatoes in those samples were actually uncontaminated. All the rest of them were contaminated and we passed our test on that.

So what does it actually take to do the type

testing that we're talking about here? This is from our laboratory. If you want to do it, you need multiple high purity germanium detectors. Each one of these systems cost about $110,000.

They require liquid nitrogen for cooling the detectors. They have high resolution so you can see very large number of radioactive isotopes in them.

Unfortunately, they only do for gamma emitting isotopes, so things like Strontium-90, which is a pure beta emitter which you can't see. You also can't see Plutonium or things like Polonium-210.

It is non-destructive, meaning you're not destroying the samples, which means you can take the gamma testing first. And you can take that sample, pass it down and you can do chemical analysis to extract out the other things you're looking for.

It is very fast. In about two to four hours, you can achieve limits that are close enough that you know whether it presents a risk to members of the public.

For things like Plutonium, Polonium, you need to do alpha spectroscopy. Each one of these chambers is $15,000 a piece. You need to do extensive acid digestion of your samples. So this process takes typically, days to maybe even a week

to do a single sample, so it's very slow to use. And you also have to use radioactive tracers, meaning you have to put in something of the same isotope -- sorry. The same element, different isotope. Say if you want to test for Plutonium-238 and 239, you put Plutonium-242 in so you can quantify the recovery.

Some of the issues to consider, obviously, we're reactive, not proactive in most cases. We only can really take action after we know something happened. There could be terrorist contamination, which could occur with a small chance of infection. If they do crop dusting, for instance, they do crop dusting at night. All you'd hear is the aircraft going over the fields. Is the farmer going to know that something took place? He may never know. He may be selling contaminated tomatoes out there and the public would never know it.

The laboratory capabilities are expensive and scarce. The same labs that do part of the FERN testing are the same ones that do environmental monitoring. Only 25 labs participated in the latest FERN test.

So I want you to think about it. If there's an event and we actually know there's an event, the

forecast is there's going to be a half a million samples collected. So you've got 25 labs, and you have half a million samples to analyze. How is that going to work?

Think about the alpha spec. It takes days to weeks to do a single alpha spec sample, and you've got a half a million samples that need to be analyzed.

WILLIAM ATHERTON: You're going to have to sample the samples.

JOHN WILLIAMSON: Yeah. It's going to take a lot of very careful consideration of which samples are priority.

DILS are protective, in the United States at least. Most first world nations, you may not get the public to accept any amount of radioactive contamination in the food. States with nuclear power plants have few opportunities to practice doing ingestion pathway exercises. Once every eight years is all we're required. If you don't have a nuclear power plant in your state, there's almost zero opportunity to actually do ingestion pathway, unless you can talk one of the big federal agencies, DOE or DHS, into bringing a federal exercise into your state.

CAMILLA GUY: In slide 42 with the CP, CBP monitoring, how much will that cost in terms of, like, the bulk monitoring system, itself? Say for facilities that do processing and they receive it from farmers before, say a contaminated produce enters a facility and gets mixed in with everything else?

JOHN WILLIAMSON: You mean how much would it cost to clean it or how much for the monitoring system?

CAMILLA GUY: The equipment. How much is the equipment, itself?

JAMES FUTCH: The same portable monitors for --

JOHN DANEK: Yeah. It is anywhere from probably, depending on -- bigger is better. The bigger the monitor you have, the more sensitive it is.

CAMILLA GUY: Yeah.

JAMES FUTCH: Plastic simulator.

JOHN WILLIAMSON: Yeah. So you can go anywhere from 5,000 to $100,000, because part of it is bigger is better, but also higher resolutions is better. Higher resolution -- the higher your resolution, the more expensive. Those germanium detectors I showed, $110,000 a piece. You can get a sodium iodine

detector for about $5000. But a sodium iodine, the width of its peak is 40. A germanium, the width of its peak is one. So you can hide a lot things under something 40KEVY, but you'd never see them. So is it worth it to pay $110,000? Maybe it is. But if you have a half million samples, maybe you want to screen first and see if there's anything in there, and if you do find something in there, then you'd screen it with the high resolution.

JAMES FUTCH: Yeah.

JOSEPH DANEK: At least detect it initially with sodium iodine and then you can isolate the stream.

MARK SEDDON: Right. The sensitivity of these is limited based upon your container and everything else, too. That's what you're trying to control it for.

JAMES FUTCH: Usually for this set up, they're looking for, you know, is there something there.

MARK SEDDON: Yeah.

JAMES FUTCH: And then they will pull it apart and go looking and maybe look with something a little more high resolution to see what it is.

JOHN WILLIAMSON: I don't know if you remember, but DNVO, which was part of DHS, which was

originally the domestic detection office, they spent a couple million dollars trying to see whether they could develop a detection system that would be used by CBP nationwide that would be able to be not just detection, but detection and accurate determination of the isotope, because the isotope makes a difference.

If you've got a load of bananas going through, you're going to get K-40. Do you care? No. But if somebody is putting a load of bananas or a load of ceramic tile and they're putting a nuclear weapon in the middle of it, you need something that can see that nuclear weapons emissions underneath the other stuff. And they spent millions of dollars and in the end, never could get something that would really work without spending horrendous amounts of money.

Large germanium detectors, they require cooling to temperatures like nitrogen and they're very, very expensive. I mean, one for the laboratories a hundred thousand dollars. If you want one big enough to do this kind of work, it could be a million dollars.

CAMILLA GUY: Thank you.

CLARK ELDREDGE: All right. I had a couple questions here. A couple points I'd like to you

expand on because I've got a half a brain on these things.

So when you're talking about instances like the RTG exposure and things like that, the reality there is what is actually the -- what is expected to be the morphology, what happens to the material there, because it's solid. It isn't expected to, like, atomize or anything in the explosion or is it?

JOHN WILLIAMSON: Worst case scenario, within the first forty seconds of launch, it goes up and turns around. Immediately comes down and hits the hard surface. The hard surface causes a fire hot enough to destroy the uridium, graphite and stainless encapsulation on it. Break the ceramic alloys, Plutonium-238 and disburse it. It's like the -- their typical odds on that happening, on having that type of a launch is one in a thousand.

JAMES FUTCH: I was talking to Kelly, one of the guys from Department of Energy about that when we were on site monitoring for perseverance. He reminded that was five solid rocket boosters on the outside. Once you light them, you can't turn them off.

JOHN WILLIAMSON: Right.

JAMES FUTCH: So his communication was the

rocket comes up, the payload ends up somehow on the ground underneath the solid rocket boosters in some sort of an accident. And that provides a lot of additional thermal energy to your ablation package. Not very likely, thankfully, but --

CLARK ELDREDGE: Then we've actually had, the next thing you talked about materials getting into, or contaminated materials getting to a processor and contaminated it. We had that not related to food before. The Jacksonville smelter.

JOHN WILLIAMSON: Yeah. In 2001, a steel recycling plant near Jacksonville melted down, probably ten millicuries Cesium-137 source. Costs --

ADAM WEAVER: Didn't it come from a moisture density deal?

JOHN WILLIAMSON: Well, that size probably. It cost 10 to 12 million dollars to decontaminate the facility and you melt Cesium, it volatilizes, ends up, the majority of it going through the air ventilation system. Gets trapped in the backhouses where all the ash is. And then the rest of it gets expelled out from the pipes, which could technically -- not technically, in actuality, do vent to the atmosphere. So if you had residents

who's near there, the possible residents could've been --

JOSEPH DANEK: How was it identified? You detected -- that you'd guys responded to it?

JOHN WILLIAMSON: They had a, on their smelt bucket, they had a monitor on the smelt bucket.

JOSEPH DANEK: Okay.

JOHN WILLIAMSON: So they had been having a lot of electrical storms and their conveyor belt detectors had been going off and on. And they thought it was another electrical issue and it wasn't. They didn't know until it melted and came out of the smelt bucket.

JASON NICHOLSON: Oops.

JOHN WILLIAMSON: Yeah.

CLARK ELDREDGE: Then we actually do, in this country, have practical experience, so to speak, with hunting restrictions. The Savannah River site.

JAMES FUTCH: Yeah.

JOHN WILLIAMSON: Yeah. Par Pond in 1970, Savannah River site, had an overflow of one of their reservoirs into the Par Pond area. They had Cesium-137 contamination for a very, very long time. And they actually, Savannah River Site, they -- because that had been prime hunting before the site

was ever built and historical basis, so they allow hunters on certain parts of the property. And they actually had to monitor the deer before they were allowed to take them off site. Sort of self --

ADAM WEAVER: Unless they're getting road kill. Same thing with road kill. When I was at FPL, we always had to monitor the deers.

JAMES FUTCH: I remember someone in Savannah, similar to what you were talking about, they were out hunting and how many they could take or how many they're allowed to, to deal with. And we were involved in a federal FEMA exercise through the AMS, assets at the federal level in South Carolina. And so we had FHPs airplane with our detectors in it. And one of the missions you would run was to see what you could pick up in your mapping in that area. Some of us didn't realize what was in that, the pond leak area. And so would were expecting to see discrete large sources that the Savannah River folks had brought out of their facilities and left out, Cobalt-60. And we actually detected Cesium-137 in that area. We couldn't see it live when we were flying like you could with the much larger source like the Cobalt-60.

When we got back and everyone went back to

analyzing data and reducing maps, you could see it quite clearly. So it's still out there. It migrates through the biological food chain quite well.

JOHN WILLIAMSON: Yeah. I'll throw FPL under the bus.

JOSEPH DANEK: What's that?

JOHN WILLIAMSON: I'll throw FPL under the bus. We use to do goat milk sampling near the St. Lucie plant. We had one lady who had goats out there. We would occasionally see Cesium spikes in the goat milk. And, you know, of course members of the public, they, of course, blamed that on FPL.

We asked her, she's is like, I can always tell because their milk tastes rotten because they've been eating the palmetto berries. Palmetto berries are uptaking the Cesium from the atmospheric testing forty some years earlier and the goats, being goats, you know, they stick their snoots through the wire mesh of the cage, of their pens and eat the palmetto berries. Also Brazilian pepper.

JOSEPH DANEK: Yeah, Brazilian pepper, yeah, that's a good one.

JOHN WILLIAMSON: Brazilian pepper is a trash plant. Yeah. In Florida, we like to extinguish it.

Brazilian pepper uptakes Cesium-137 very, very well.

JOSEPH DANEK: Yeah.

JOHN WILLIAMSON: We use it as a marker because it is a trash plant. Nobody cares if you remove the plant, so we use it as a marker for the broad leaf vegetation around the utility sites.

CLARK ELDREDGE: It's an invasive species in Florida and should be eliminated on sight.

JASON NICHOLSON: Good luck with that.

JOHN WILLIAMSON: Yeah. We've actually had to ask the utilities, please leave this here so we don't have to pull the mangroves instead.

JAMES FUTCH: Take all of them. I had a question for the council members. This is a -- let me back up. So this is -- Clark and John have been working for this outfit for a really long time, including doing dose assessment and John's staff works really up close with the chemistry. I don't think I've ever seen all of this pulled together in, in one presentation in such a comprehensive way. I know it was, it was a lot of detail and facts. It's a council with a lot of scientifically oriented folks, so it's appropriate.

But all of this information John's going to be giving, I missed the first part of this. You

probably explained you were going to be doing this again for a food group next week I think.

JOHN WILLIAMSON: Next Thursday.

JAMES FUTCH: What was the, what was the, what was the origin of how that came to be and what is, what is the group's expectations, would you say?

JOHN WILLIAMSON: Well, I'm not really sure because a friend of mine from the EPA --

JAMES FUTCH: You got volunteered.

JOHN DANEK: -- volunteered me to do it. And I asked him what he was, what, what he was -- he originally thought about presenting and he said, yeah, that.

ADAM WEAVER: That's good.

JOHN WILLIAMSON: That was it.

JAMES FUTCH: This is crazy. I'm really excited about this because this is one of those areas that I think the average person doesn't have a lot of knowledge of. Folks who handle our food safety and are right up close and personal in the industry producing it, marketing it, whatever it is, they're crucial to, to -- that they understand this if something were to happen. So I think it's a, it's a marvelous opportunity.

JOHN WILLIAMSON: You know John Richards,

right? You know John Richards? He's the EPA guy.

JAMES FUTCH: Right. What I was going to ask the council was, how much of this did you know? I'm not trying to volunteer anybody to say they don't know anything.

WILLIAM ATHERTON: Not a lot.

JAMES FUTCH: I'm just wondering how -- I think this talk could be used in other places. In Tallahassee, the Commissioner of Agriculture used to be the senate president. His name is Wilton Simpson, and he's on the radio every Wednesday, relatively speaking, one of the local talk shows, with just one of the local talk guys who happens to know him and he loves talking about agriculture. Before he was the agriculture commissioner. I think that was probably one of his goals was to get to the agriculture commission. He's a farmer up in north Central Florida area.

I think this education -- this presentation or some subset thereof, would be really valuable for someone like that or, you know, some other decision makers that many folks are out here may know. Not saying John because he has to give it all the time. But -- but I think, I don't know. What do you all think?

KATHLEEN DROTAR: One of the things that I thought was really interesting was the ten miles and the fifteen miles. And then having things separated so that you're aware of what was happening and it was being monitored. And the cows were sequestered outside the area or housed inside so that there's protective measures that are there should something happen.

And the other thing was when you would say, you know, how much, you know, are people going to eat this or consume things that they, once it gets out, that there was contamination. And I immediately went to in the grocery store where you have items that have been eradiated and they won't touch them. So, you know, just having the information that there are levels that are safe I think is something that's important, too.

WILLIAM ATHERTON: One other thing that I always struggled with people asking me questions, is just with different types of radiation that they -- it's hard to wrap your head around eradiation from, you know --

JOSEPH DANEK: Contamination.

WILLIAM ATHERTON: Emitting radiation, so I think that might be good.

JOSEPH DANEK: Contamination versus eradiation. Contamination has radioactive material in it.

WILLIAM ATHERTON: Yeah. The difference in radioactive material and something being --

JOHN WILLIAMSON: Yeah, contamination versus exposure.

JAMES FUTCH: If you'd like to see it, we have an hour long radiation --

WILLIAM ATHERTON: No, no. I had a vague sense of what you guys did, but it was nice to actually see the specifics that, this lab here and this testing here and this is how often we do this. It was very interesting.

MARK SEDDON: For the DILS, do they differ, based on standard environmental monitoring level expectations versus what to expect for an event?

JAMES FUTCH: Well, I'm not sure if the DILS hearing, but the question of I think what to do with it once you actually have it, we usually think of this in terms of EPA's long-term levels of applying to various, you know, material.

I don't want to speak for John. What we usually say internally are, these are the standards now. And then when the crap actually gets here and,

you know, a lot of this to be dealt with, the agency and the powers that be may revise those. Probably upward.

MARK SEDDON: That's what I was thinking. There would be some variability.

JOHN WILLIAMSON: Well, the FDA will tell you the DIL is the DIL is the DIL is the DIL. It's simply a level. They calculated it and it's a specific value that food below that is safe to eat. Food above that, the risk is higher than they're willing, you know, it's 500 millirem a year.

MARK SEDDON: Right.

JOHN WILLIAMSON: In the United States, the question is what is the public going to accept. If people are starving to death, they're going to accept food to the DIL.

MARK SEDDON: Right. Do they, do they vary or change or adjust the calculation spreadsheets when all the variables are there?

JOHN WILLIAMSON: No.

CLARK ELDREDGE: It's a very laborious process or research process where they come up with different models.

MARK SEDDON: Right.

CLARK ELDREDGE: It's like, you know, you deal

with -- yeah, they come up with different models and stuff that's actually done in periodic, but it's not --

JOHN WILLIAMSON: It is just like you do dose assessment. It's exactly the same thing.

MARK SEDDON: I gotcha.

CLARK ELDREDGE: Yeah. They've revised the DILS twice since I've been involved. Once, since I've been doing --

JOHN WILLIAMSON: Well, the last revision was in '98, so they don't do it very often.

CLARK ELDREDGE: Okay.

JOHN WILLIAMSON: You could say 2017, the EPA water PAGs were --

JAMES FUTCH: How many decades did we go through exercises with the standard question, what do you do with the water? Okay. At least we have some values.

CLARK ELDREDGE: Are the DILS still based on ICRP 30? That period?

JOHN WILLIAMSON: If they haven't changed since '98.

CLARK ELDREDGE: Yeah, they are. At some point they may be updated to -- so, yes.

JOSEPH DANEK: Correct me if I'm wrong, in the

United States, we've never had an actual event take place were you would be in a situation to implement DILS in this whole entire program. If you look at Fukushima, they have done it. They've done the whole nine yards. There's more contamination, remediation.

JOHN WILLIAMSON: Well, I mean there's never been a domestic event, correct.

JOSEPH DANEK: Yeah. Versus Fukushima, they've done all of it.

JOHN WILLIAMSON: They did use the DILS on Fukushima food.

JOSEPH DANEK: Mm-hmm.

JAMES FUTCH: And I think -- any other questions?

WILLIAM ATHERTON: I have a quick question. A little bit on that thread. How does -- I don't know if you know this, but the United States, the way we deal with this, compared to other countries like the European Union and Japan and other countries -- is it -- do we do the same thing as they do or they do the same as us or? Or you don't know.

JOHN WILLIAMSON: I don't know specifically.

WILLIAM ATHERTON: Just curious.

JAMES FUTCH: I think one thing that happened

in Fukushima was, there was a lot of practical knowledge gained and the U.S. Department of Energy, the AMS folks we've been speaking about, were out there flying those systems in Japan to protect the servicemen and women. And then later on, they left some of those behind and they trained a lot of the Japanese operators in how to use that. So I would imagine there's a heavy influence from the U.S. on what Japan was doing. I don't know about the actual levels. I can't speak to that.

I will say this, Western Europe --

JOHN WILLIAMSON: Put it this way, I have seen articles from Japan, translated into U.S., translated into English that talk about the safe levels of radiation in food. In fish, specifically, using the U.S. DILS. So I don't know what their rates -- they may be based on IEA guidance that ties back to the DILS. But I've seen the same values expressed in their articles about their own food products.

WILLIAM ATHERTON: So largely, it's a work in progress kind of.

JOHN WILLIAMSON: Let's just hope we never really have to implement any of it. The sampling, on -- I can make up a lot of the stuff as I go. I

can't make up exigent factors, you know. Half a million factors from a single event. Suppose it's a multiple event; multiple states?

MARK SEDDON: Thank you. It was very good.

JOHN WILLIAMSON: You're welcome.

JOSEPH DANEK: Good job.

MARK SEDDON: All right. Okay. I guess we can move on to more discussion on sampling & decommissioning, Jason.

JOHN WILLIAMSON: Kevin.

MARK SEDDON: Kevin, I'm sorry. I got off track. Kevin.

KEVIN KUNDER: Materials section update. I went back and looked at the minutes from last meeting. I guess there was a question I had mentioned about a new licensing condition that would be added to the medical licenses during the next amendments, and it regarded annotating reports of medical events and dose to an embryo/fetus or a nursing child. And one of the things that they had asked for is that -- required is identification number, which could be Social Security number. And Chantel brought up, you know, the infant -- not infant, but the embryo or fetus not having that. And it would be, it would be obviously the mom. You

know, that's what it -- that's how it's actually worded and stuff. So she's not here, but that's already going out there on the new amended licenses and stuff.

The second thing from old business is our, our inspection program of our program, IMPEP, the Integrated Materials Performance Evaluation Program, which is our RAM licensing program inspection by the NRC and other agreement state peers that was last June we had talked about and then they provide us a report that they send off to their NRC management review board, they call it the MRB. And the MRB makes independent findings of radiation control program adequacy and compatibility based on the result from the IMPEP review and input from IMPEP team members, MRB members, agreement state programs and of course, us being the agreement state program in the review.

Clark and I were supposed to travel to Bethesda, Maryland to provide our input. However, the impending government shut down at that time turned into a virtual meeting and then at the last minute, turned into a hybrid meeting. But we were able to give our input and the MRB occurred October 5th, with the final report dated November 3rd of

last year. And it's available on their website, which we have a link on our website, which is floridahealth.gov/RAM.

The MRB findings for the performance indicators of technical staff, staffing and training. Status of materials and inspection program, technical quality of inspections, technical quality of licensing actions, technical quality of incidents and allegations, and the sealed source and device evaluation program, we were found satisfactory, which is their top level. There was no issues there.

The only one we had a problem, which is in their new designation, they call it LROPE, which is Legislative Regulations and Other Program Elements, we were found unsatisfactory. Which is the rule we've been trying to get through for the last several years.

They closed three of our 2019 review recommendations. They opened a new recommendation to have us manage implementation of our compatibility plan, to establish realistic timelines and leverage senior management engagement to ensure timely adoption of current and future regulations.

So in other words, we need to be on top of

working with legal in getting that through. But accordingly, the MRB chair agreed with Florida state, with the Florida agreement state program, be found adequate to protect public health and safety and not compatible with the NRC program. The MBR chair agreed the next meeting would take place in two years, which is kind of a half day, kind of how you doing type thing. And the next full IMPEP is on a regular schedule, which is four years out.

Staffing, last meeting, materials was down a regulatory specialist. That person performs minor licensing actions like adding and removing authorized users. This was filled by Duane Moore. Giovanni Manning left materials for the infamous technology section. However, we were able to get back a twice-retired Joyce Mackelroy to fill the manager position for inspection coordinator enforcement. So we're completely staffed at this time.

Rule making, still in progress. It's back out of our hands, back with the Department of Health's general counsel's office. So still waiting. Can't give you any estimated dates.

Statistics, as of last month, we had 1513 specific licenses; 234 general licenses for a total

of 1747. We averaged close to 200 licensing actions a month, which is about three new actions a day for each of our three evaluators we have. Which is quite commendable considering some actions are new licenses with hundreds of pages to read and possibly several deficiency letters to send out and waiting for missing information and close to 75 RAM inspections a month that we processed and turned into compliance or violation letters for our licensees.

General license invoices were mailed out May 1st. And just a final thing, which is something we started doing the last couple years, is there's a Florida Statute Section 17.20 that requires the state agency to assign delinquent accounts to contracted debt collection agencies within 120 days after the accounts are due and payable. So for the first ten months of this fiscal year, so far our section has referred greater than $73,000 in delinquent accounts to Transworld Systems, Inc. Collection Agency, for which we recovered so far just over $30,000.

Medical events, we had just one. It was the last quarter of the calendar year last year. It was an HDR outpatient facility where the owner MD sold

to a larger practice and stayed on as the AU, authorized user. However, the purchaser had not applied for new license; brought in their own treatment oncology information systems. However, could not hook it directly up to the existing delivery system due to the older XP operating system, which required the site to utilize a sneaker net.

They performed three breast HDR treatments, each with ten fractions over five days. The first patient went through all ten fractions without anyone noticing, as a physicist failed to verify treatment times and delivery doses.

Second patient and the third patient went -- got all eight fractions, came in for the last eight, that's when they determined that they already reached their prescribed dose, so they canceled the last day of treatment.

The last one is the one they actually called in to us as a medical event. At that point, it was just a single medical event they called in and at first glance, looking at the total numbers by our regs, it is was not a medical event. However, we -- our investigation, we went back and said, okay, since this happened, technically, you don't have a

radioactive materials license. Let's go back to the very beginning. How many had you done? That facility only had done three. We went and pulled those. We found that first patient that got all the way through and they were cited for operating without a license and overexposure of a patient by more than 40 percent over the prescribed dose.

Final thoughts that I have. This week, May 6 through the 10th of year, is Fusion Energy Week. There's currently no research or development currently being done in Florida. However, we expect to see something soon. Within maybe next two to ten years. There's currently greater than 50 companies worldwide, with 28 of them in the U.S. at some stage of development if we're looking at fusion for energy.

Currently, we'll license them under part two, with no plans for, like, a separate section like we do for medical, for part six.

We authorized the tritium in activated products. Required decommissioning costs in bonding, bioassay programs considering depending on if they're getting treated water or treated gas because gas would be -- or the water would be a bigger deal.

Public dose, to include air emissions, environmental surveillance, a user responsibility would be more for radiation protection, tritium handling systems, waste management, but not the actual fusion process.

We consider -- we have to consider the seismic impacts of anything, but we'd also consider sinkhole considerations, as well as the usual shooting fire texts and warnings, all that stuff.

We're currently looking at adding two new license categories, fusion for R and D and fusion for our power production.

Last meeting, maybe the meeting before, we talked about the NRC rule making process for reporting nuclear medicine injection extravasations as medical events. So last year, the NRC issued a request for information and preliminary proposed rule language with a 90-day comment period, which was extended to 135 days.

Based on that feedback, the NRC revised the definition of extravasation; removed the definition of medical attention and changed suspected radiation injury to radiation injury. And revised the definition and made changes to the proposed revision of Part 35 in the new sections.

We have a couple more weeks, June 11th is the close of the agreements day comments period. We're preparing our comments to be submitted to the NRC. Mid June is the ACMUI, the Advisory Committee on the Medical Use of Isotopes, their subcommittee, and they'll send the stuff off to the commission. As well as August 12th, they're going to have the proposed rule and draft implementation guidances due to the commission with the final rule implementation, implementation guidance due to the commission by March of 2026.

Proposed rule definition extravasation means the unintentional presence of radiopharmaceutical in the tissue surrounding the blood vessel following an injection. And radiation injury means the deterministic health effect to the area around an injection site that can be attributed to radiation.

I looked up, there's been several studies out there and it looks like whenever we, we do vena puncture and we puncture the vein, it looks like anywhere to 40 to 60 percent of those, you're going to get some type of extravasation. So for nuclear medicine, that's like every other patient that we're going to have to be coming up with some way of monitoring to make sure that it's not causing a

radiation injury.

Proposed rule procedures for evaluating and recording extravasations for any administration which extravasation can occur, the licensee must develop, implement and maintain written procedures to provide high confidence in extravasation that results or has the potential to result in a radiation injury as determined by a physician, will be detected in a timely manner and reported in accordance with reporting guidelines.

Required written procedures must address how the licensee determines that the extravasation meets the criteria for a medical event and how the licensee documents this determination. And the licensee must retain copies of the procedures.

They're working on a new reg guide, 8.16, which is medical events and medical event evaluation and reporting. Only required to report if the administration results or will result in unintended, permanent functional damage to an organ or physiological system as determined by a physician. Also provides guidance on what is patient intervention. If the patient moves or dislodges, that's on the patient, basically, and would not necessarily be considered a medical event.

Let's see. Events associated with extravasation, it discusses radiation injury as defined as all deterministic effects reasonably attributed to radiation as determined by a physician must be reported, including radiation induced erythremia. Any physician can make the determination, but the licensee is the one who still reports the events. And extravasations are not reportable if they do not have a potential to result in radiation injury.

Monitoring proceedings will be developed as well for administration in which the extravasation could occur. Monitoring proceedings for evaluating and reporting extravasations are included in the radiation control program director's letter and will be available on the Adam system through NRC. And the model procedures will also be added to a new appendix, to Volume Nine of the new reg 1556.

And then the last thing I just want to make note, which kind of covers all of us, and Chantel is not here. She'll probably be the bigger one on this one here, is under the previous leadership in the Office of General Counsel, we were given special permission to release records to requesters whose names were listed on radioactive materials license.

That has gone away. We're going back to what the statutes require. So all records, all requests for copies of licenses, registration documents, anything else, any other kind of documentation, it has to go through the regular public records process. It's real easy. You go to flhealth.gov/records. You go there. There's phone numbers, there's e-mails. There's a way for you to get on there and create an account to log in whatever request that you want.

So that's just the last thing I got. But to let you know, we do get a number of e-mails and phone calls saying, hey, send us the latest copy of an amendment or registration or whatever, these now go through the public records. So flhealth.gov/records.

That's all I got. Any questions?

MARK SEDDON: Is there any movement on -- I know because, you talked before, trying to have, like, some type of pre-approval list of those folks who are authorized users or have been approved by the state previously?

KEVIN KUNDER: Coming up with --

MARK SEDDON: You're talking about public, public records requests?

KEVIN KUNDER: Right.

MARK SEDDON: Is there a way to obtain that from the state rather than reaching out directly to the facilities?

KEVIN KUNDER: Not at this time. It's not something that we've actually put together.

MARK SEDDON: Okay.

KEVIN KUNDER: It's not something that we do. Public records requests, we don't have the actual record.

MARK SEDDON: Right.

KEVIN KUNDER: But we can look into something like that.

MARK SEDDON: Some of that had been mentioned before. That's something that could be possible.

KEVIN KUNDER: We haven't even discussed, you know, x-ray, the radiation machine program where they're getting things online now --

MARK SEDDON: Right.

KEVIN KUNDER: -- and doing things that way. We haven't looked at materials yet. So there may be some things that we might be able to do when we get to that point.

MARK SEDDON: Okay. Very good. All right. Any other questions for Kevin? Materials? All right. Thank you, Kevin. Appreciate it.

KEVIN KUNDER: All right. Thanks.

JASON NICHOLSON: I guess I'm up next. I'm Jason. I'm one of the environmental managers in Orlando. I run a rent program. So I have literally seen them tearing down this plant over the last seven years.

I'm not Monroe Cooper, who was originally going to give this thing. He's actually giving the same presentation in Crystal River right now.

So, Jason. So we're going to go over what is nuclear power, what sampling occurs around a power plant and what is decommissioning. This is like the very basic grassroots, not into-the-weeds version of everything, so it's pretty easily digestible.

So for nuclear power, we all know it uses, like, really nasty spicy rocks, right? Because how do you make nuclear power? You've got to get water hot, right? Boil it. Spin a turbine, it goes whee, spins a generator, got electricity. Easy day.

So, basically, they start with the raw uranium, and only about .7 percent of it is useful. Then they refine it and get it all way up to a whopping three to five percent and they add a whole bunch of other coatings and claddings and then you come up with your fuel that gets put in the rods and drop it

in the water, boom. Got a reaction. Makes heat.

Who knows what the other, like, 99.3 percent becomes if --

JOSEPH DANEK: Waste.

JASON NICHOLSON: Depleted uranium. So, well, on this, not that, that becomes a nightmare.

So the stuff that's used in a power plant can't really be used for a nuclear weapon because it's not enriched to a high enough of a standard. It's like you could make a crude bomb with it, but none of the stuff that blows a hole in the side of the earth. So none of that.

Um, he used the wrong thing, but it's the same concept where you have a neutron hits the atom, bam, magic happens. It fragments off into two different ones and another neutron is released and it just creates a chain reaction.

JAMES FUTCH: There's one fix.

JASON NICHOLSON: In my version it was fixed.

JAMES FUTCH: This one got completely approved by the department.

JASON NICHOLSON: I know. That's the craziest thing.

JAMES FUTCH: Not a lot of uranium knowledge.

JASON NICHOLSON: What's funny, had I not

mentioned it, nobody probably would have caught it.

JAMES FUTCH: This audience would've.

JASON NICHOLSON: Yeah. Get stuff thrown at me. Yeah.

So the big thing with nuclear power is the cooling because that bad boy makes a whole lot of heat. We're talking about 550, 600 degrees worth of heat. And then the fun thing is they try to get the water not to boil while they do it. So there's all kinds of gee whiz stuff involved in that.

So there's three loops in the cooling system. You have the primary, the secondary and the tertiary. The primary is the really nasty water. The secondary has very minimal contact with the primary water, so it's much cleaner. And then the tertiary is -- whoa, that was not expected. Is what gets released back to the environment.

So if you think of like, I guess none of you have been there, like St. Lucie or Crystal River nuclear plant, literally, it dumps it into the ocean or the Gulf. Big canal off of that one.

So the primary one is the water that gets to -- goes all the way around the reactor. It picks up the heat from the rocks. It basically takes this journey, you have a pressurizer that knocks it up

to, I think like it's 2200 PSI or something crazy so it doesn't boil. Then it goes off screen over here to a steam generator. Actually, it goes to a -- it's like a big heat exchanger. It's in the next slide. But then it comes back.

We've got to do a low-level waste thing of the primary coolant pumps from Crystal River. And like, if you would have got in the tight V cast, it's lethal, but standing outside of it, you can have a nice conversation because the shielding of the tight V container, so I thought that was pretty cool.

Here it goes. The secondary one. So the primary comes over here, and then it's basically -- trying to think of the word.

JOSEPH DANEK: Condenser.

JASON NICHOLSON: Yeah, condenser. Yeah, it goes in. Basically heats the other water so we can go do nasty things, and then it spins a turbine. The turbines are kind of cool because as the pressure drops as it goes over each set of blades, they're designed differently to operate at a peak performance at the pressure. So the first one is getting blasted by the full pressure, the steam, and it loses energy and hits the next one; hits the next one.

So if you ever see a picture of one, it's like a long thing with all these fan blades and the pitch is different on each set to compensate for the lower pressure.

And then the tertiary is this one right here. That's the water that comes from the environment, goes through the plant and then comes back out into the environment. On paper, it should be perfectly clean. 99.99 percent of the time, we pick up basically nothing. Every now and then, there's a little tritium in it. Just, it's there. Nothing you can really do about it.

There it goes. The containment building. The big thing that, you all know what the minions are, right? Parking thing minions. Yeah. So the building that looks like a minion is the containment building. They're about four feet thick of reinforced concrete. The rebar in there is about the size of your wrist. Then they have a layer of steel on the inside.

The one at Crystal River, they're still trying to figure out how they're going to take it apart because they're so well built, they're designed like an aircraft can hit them. You can hit them with all kinds of stuff and it just kind of brushes it off.

So the last I heard, the plan is to basically jack the whole thing up, start cutting sections and lower it down, cut a section and lower it down, cut a section and lower it down, but that might change.

So here's the fun part. The environmental monitoring. Plants are required by the NRC to maintain compliance with all their stuff with the EPA and everybody else. We come in because we would be doing it anyway, so they pay us to do it for them. It's kind of a sweet deal. I think we're the only state that does it.

JOSEPH DANEK: It's the only one I know.

JASON NICHOLSON: Yeah. And the plants actually like it because we're a one-stop-shop. We're easy to work with. They've always been nice to me. We basically have all the toys to do it. It started back in 1970 before they had the plants. So there's data from when there was nothing here, all the way up to today when you have the plant being decommissioned.

And the thing we fall under is the ODCM, the Offsite Dose Calculation Manual, which gets upgraded every year.

This is not our location. It's Monroe's location.

All right. So one of the big ones we do every week, and there's only five actually, because CO7 got taken out by the last hurricane up there and wasn't replaced because we're decommissioning. But we do weekly air samples. They go on this little 47 millimeter fiberglass filter, take them back to the lab, they analyze it.

We have five sites. The one's that control, the top one is at our office; the rest are around the plant. It's actually a pretty nice drive because you're in the country. There's no traffic. It's kind of a perfect job. They're doing these little huts, and we have a big vacuum pump, but like the filter sits out here.

When the plant was operational, it had an iodine cartridge which went there and it goes through the tubing through a gas meter like you have on the side of your house, goes to a little flowmeter so we can measure the flow, a valve to do it and then off there is a big old pump we get from Granger.

That's a map of the sites. So CO7 down here at the bottom, Crystal River, it was downtown by the water tower and their splash pad. It took about four feet of water during the hurricane last year so

they decided not to replace it because the city condemned the building, the shed it was in, which I thought was funny. They put the official notice, and it's a four foot by four foot shed. That got a giggle out of me.

Has two of them right here. Like, one is on each side of the plant. One when you come in the plant and one is all the way up in Yankee Town, which is right next to, I think Cracker Town is the town next to it. I always thought that was funny. Neat little places if you want to retire in the middle of no where. Look at those. They're awesome.

Direct radiation. So the TLDs, we have 16 of them within the plant, twelve of them around the plant -- twelve of them outside of the plant and then one at our office. They're everywhere from neighborhoods to, next to hotels. One of them is at a boat ramp. Another one is at a beach. It's pretty cool. We swap them out every quarter. They get analyzed at the lab. We get a big old report with all the data. That's what they look like.

Who knows what that little black thing is?

JOSEPH DANEK: TLD cage.

JASON NICHOLSON: Cricket cage. Literally, you

put crickets in when you go fishing to keep them as bait. That's all it is is a cricket cage. They're tied to a pole. Some of them have a little sign. If it was bigger, you could see a map of them, but they kind of go in a ring, around the EPZ and you got the ones in the middle. I think they were talking about getting rid of all the ones on the outside, like in two years or something like that, because there would be nothing left of the plant, but none of that is finalized.

Let's see. Saltwater or water. We take three water samples there that are just surface water. So C14H, which stands for head, this is the head of the discharge canal. You've got G for gulf. At the end of the discharge canal, we actually do the intake, which there should never be anything in it so it's a nice comparison. You can see what the plant pulls in and what the plant was releasing and then what happens to it a mile down the, down the canal.

Let's see. And that's just a map of where they're at. Kind of useless knowledge. But this road is almost impassable right now because it took a whole bunch of water and there's still trees, giant boulders and kind of stuff washed out. It's kind of a pain to get to it.

Ground water, we do 13 samples every quarter, which is wells from about 20 to 40 foot deep that are basically just in a circle around the plant. So we pump water out of there. Each one gets pumped out a gallon. We do a couple qCs; take them back to the lab.

And then we got, okay, yeah, there we go. That's basically what they look like. Just normal environmental monitoring wells. That's a map of them over there. They just circle the plant and then there's some that are out along the canal to grab the water there.

What's real fun is useless knowledge. Next to Crystal River over here used to be an oil plant that got converted into a coal plant. When they tore it down, our wells are on, like, the line in between them and two of them got completely demolished by a bulldozer. And so they had to redrill them and everything else in the same spot. That's like, yep, that's good.

So drinking water, we do three drinking water samples there. Which is literally, we go to the designated location; turn the faucet. It's the same water the consumers get.

C18 comes from the base of the well. There's a

valve. The other two is a hotel and Crystal River City Hall. Grab the one from them. Hey, there's the water tower in the thing.

So shoreline sediment. This one is kind of fun because I get to tease my friends and say, I go to the beach, because some of them are by the beaches. The bottom one at Ford Island, C14G. It's just put dirt in jug; take it to the lab; see what's in it. Usually there's nothing. Every now and then, there's something a little strange, but who knows where it comes from.

Somebody getting it. There's the map with three of them.

This is my thing, because I grew up in the Panhandle fishing, so I like to fish. And I joke with people that I got -- I went to college, joined the military and then worked for the state to go fishing. So we have two samples we do. We do them every quarter. We do the intake and then the discharge canal. It's not as good at St. Lucie, but there are some pretty big fish in the discharge canal because it's warm. We do it in the spring and fall when the Gulf is still chilly. The big fish come in there. It's pretty cool.

That's Mark, one of other managers with, like a

black marker or something. There's a boat ramp at the very end. That's small. I've had ones like that I cut into four pieces and used as bait to catch something bigger. So it's all fun.

Broadleaf vegetation. We go get Brazilian pepper. We have one that is -- our office is the control site and then we have two of them there at the plant. One is when you drive in and one is right next to the plant. And I think we've been doing in the same spot every since it's been done. So it's a nice comparison.

Hey, there we go. Brazilian pepper. Who likes the way that stuff smells?

We do food crops. We get citrus and the watermelon one. I like the watermelon one because we get to go to a watermelon farm and yes, we've been getting it for years and years and years. But the guy literally recognizes me at this point when I come up, so it's pretty cool. Usually we end up with some extra snacks for the lab because somehow we always buy too much.

All right. So now we're going to get on to some of the decommissioning stuff. Crystal River basically ran for about forty years up until 2009, had a little bit of an accident when they were

cutting a hole in the side of the containment building. Long story short is, you have about 300 of these cables that circle the containment and put it under tension because everybody knows concrete loves to be compressed, right?

The original estimates from an engineering firm was to de-tension 65 of them and each one of those takes a lot of time and a lot of money. And the utility was like, ah, we don't like that plan. Had their own engineers redo it and they got it down to, like, 40 something. And when they did it, they got it down to, like, 23. And it basically, you had big chunks of the building that were fully tensioned, parts that weren't, concrete delaminated and it basically hit a point where it was not economical to rebuild it because they would have to redo the whole containment structure and that would just be -- I think the lowest estimate was like 800 million. The most expensive was like 3.4 billion, so they decided to decommission it because honestly, it's kind of a small plant.

All right. So there's two types in DECON where you basically, you clean everything up. And then you can reuse the land, which is what they're going for. But most of them start out first in SAFSTOR,

which is where you just let everything sit there because what's radiation do as it sits? Decays. So they let it sit. A lot of the danger got minimized just because some of the short-lived isotopes, they're not a problem anymore. There's some long-lived ones that still are, but that's a whole another thing.

They kind of do two at once sometimes because you can leave parts of the plant to sit and then you can start taking other stuff apart. So they had parts of the plant that were basically, they're not touching while they were pulling stuff out on the periphery, like the back-up generators and a lot of the pumps and stuff that weren't contaminated. Their generators were actually brand new. They put them in during that outage, so they had millions of dollars in these big 12 cylinder commercial diesels they ended up selling for pennies on the dollar to go out to like Montana for some mine or something like that years later.

That's just different plants and their decommissioning status around the U.S. So that's how many of them are currently never coming back.

Spent fuel storage. They're put in a thing called an ISFSI. It's basically a concrete box that

holds radioactive material forever because we really have no where to put it right now, so it gets to hang out there.

Yeah, ISFSIs. Basically, they're kind of neat because it's like a concrete coffin. They have a door that opens on the side. And the spent fuel is -- after it cools down in the pool for about a decade, it goes in this stainless steel cast that's just slid in. Has these little holes they can actually put like a forklift in and lift it up. There's an x-ray thing that goes in and they can check the integrity of the container. So it's kind of fun.

I don't know the exact cost of what Crystal River cost because I know there was negotiations between the companies, the NRC, the utilities and everybody else, but the gross estimate is 300 to 400 million. That's a whole lot of money in my book.

All right. That's not the best picture, but I thought it was really neat that the reactor was cut into three pieces underwater. So basically, they had the reactor vessel. They took all the piping that was around it that was really contaminated, put it in it, filled it full of mortar, put the whole reactor in a pool, filled it with water, cut it in

pieces and then put it in these big containers that are -- I think I looked up the weight, 635,000 pounds each. So they're pretty beefy. Like, the chains were massive that were holding it. And they had all the welding cribbage and stuff on there. It was kind of neat. We got to go on the barge and see it and there's not many people that can say I've stood next to a decommissioned reactor cut in pieces on a barge sitting in a canal at a nuke plant, so it's kind of fun.

What else do we got? Yeah. Everything had to be -- it's kind of crazy. It all had to be in its Type B container, and then covered and then chained and then strapped and then it was welded. So you could pretty much take that barge and flip it over and nothing would move. It's probably sitting on the bottom of the Gulf of Mexico by now.

I don't think he has a good picture. There was one of them that the chain was actually, to save weight, it was made out of carbon fiber.

JOHN WILLIAMSON: That's the next slide.

JASON NICHOLSON: The next one? Or the Kevlar, had the Kevlar chain. That was cool because you could go up and touch the links and they feel all soft and you see the weight rating for it and

destroys all the steel chains that were around them. So it was kind of, I don't know. I thought it was neat.

That is Monroe Cooper. I am not him, but he's the one that prepared it -- although I think there's a little bit of resemblance. I am just not wearing my glasses.

Any questions? I know you probably want to get to lunch. I can blab about this thing all day because I just think it's neat.

JOSEPH DANEK: The only comment I have, and you sort of pointed it out with St. Lucie, but the rent programs for -- St. Lucie, Crystal River, they're all very similar in their, their requirements through the -- those calculation manuals, as you point out, which is federal regulations are required, required by federal regulations to have. Very similar rent programs that do their facilities.

JASON NICHOLSON: Yep.

MARK SEDDON: All right. Any other questions for Jason?

NICHOLAS PLAXTON: I have a question. Like the decommissioning of the power plant. But like, how many power plants are being built? Are there any being built or no? Do you have any idea on that or

not?

JASON NICHOLSON: Zero.

ADAM WEAVER: Not in this state.

KEVIN KUNDER: Not in this country.

JASON NICHOLSON: They just finished the one in Georgia, brought it online.

JOHN WILLIAMSON: Vogtle II is ready to go online.

JASON NICHOLSON: Yeah. It's -- just due to whatever.

JOHN WILLIAMSON: Money. It's all about money.

JASON NICHOLSON: Yeah. They're grotesquely expensive. Like 14 billion dollars. So if you think about it, how many megawatts of power it produces, gigawatts, like however you want to scale it, you can go over it for a 50th of cost, build combines like a gas plant that has a staff of 12 per shift instead of 400 and make power way cheaper.

JOSEPH DANEK: But there are, there are nuclear reactors, small. I forget the term.

JASON NICHOLSON: Yeah, the SMRs. They're cute.

JOSEPH DANEK: SMR, modular reactors are much smaller, less to operate, less cost. But I hate to say, but politically, it's not -- depends what, you know what I'm getting at.

CLARK ELDREDGE: There are several companies developing those. New Scale is one of them. There's big folks behind them. Those are the carbon neutral type, you know.

JOHN WILLIAMSON: It's still debatable whether reducing the scale is going to produce economic benefits because although the scale is smaller, they're still expensive. They don't produce as much power.

The biggest thing right now is that there are two sites, one which was decommissioned -- it was turned off. Not decommissioned -- about ten years ago that the company, there was a company trying to bring it back to life. And then there's another one that was never activated.

JASON NICHOLSON: Bellefonte.

JOHN DANEK: Yeah. After 35 years. Somebody, a company is trying to bring it to life. And that's, that's the only really new things. Vogtle II in Georgia is the only new plant that's been built in the last thirty some years.

JAMES FUTCH: I think if you look at the, the history of nuclear power, and Joe worked in it for many years. You know far more than I do. They got a reputation because there was essentially one off

at every site and they started out with a standardized reactor, but then by the time you built the whole plant, utilities didn't know how much it was going to cost. You started in with, oh, it going to cost a billion dollars. And then every single one of them cost a whole lot more than that. So most companies are going to shy away from that investment, given that kind of a conflict.

What's changed things, I think, is that folks who were concerned about too much carbon in the atmosphere are starting to realize that you're not going to get there with geothermal and solar power. You could certainly get there with more oil and gas and coal, but that's not, that's not the pathway that, that they want to take.

Nuclear is the only thing they are left with that can produce power at scale and has done so. It's, it's -- if you look at the track record, it's the safest kind of electricity production. If you look at the carbon output, you can look at the carbon input that it takes to, you know, pull the ore out and make all the components. A lot of that is the same for a lot of plants.

So I think they're either going to be forced to -- and that's what is causing some of these

companies to look at two pathways. One smaller, theoretically, modular reactors that are more standardized, so every site doesn't have to be specifically engineered and built. Maybe reduce the cost. That way maybe you can operate it at scale. Who knows.

The other side of it is, safer reactors that don't require human intervention to shut down the reaction and keep the plant safe from a cooling perspective. That's a little farther into the future, but I think that's what -- wasn't Bill Gates one of the inventors of those outfits?

JOSEPH DANEK: TerraPower.

CLARK ELDREDGE: It's actually the state standard, the small nuclear ones, some of those designs, it's easier to make -- to cool down naturally without, without intervention.

The other option, the other thing they're doing, of course, is extending the licenses and life of current operating plants, because they're finding that reviewing the internal corrosion of the systems, they're holding up better than the original design specs. And that's -- Turkey Point is up to 80 years now they're licensed for?

JOHN WILLIAMSON: Well, they were and then they

weren't.

CLARK ELDREDGE: They were and then they weren't?

JOHN WILLIAMSON: Now they're back and trying.

CLARK ELDREDGE: What now?

JOHN WILLIAMSON: They're trying to get the additional twenty.

CLARK ELDREDGE: Okay.

JOHN WILLIAMSON: I think they needed an environmental impact statement.

CLARK ELDREDGE: Because the mechanical testing and monitoring of the system showed it was good.

JOSEPH DANEK: They have coupons on the reactor vessels.

CLARK ELDREDGE: Right. The coupons, exactly.

JOSEPH DANEK: And they -- yeah. They're constantly monitoring and testing and it's still good. It's still solid.

JAMES FUTCH: I wanted to thank Jason and John, both, actually for being here today; giving you a chance to do that. Thank you.

(Applause)

JAMES FUTCH: And we are a couple minutes late actually getting to lunch start time. So anybody who put in an order before, please proceed over and

hopefully we'll find a spot. And we have a Dr. Torres-Roca from Moffitt coming at 1:30. Hopefully we'll get back by that time.

(Proceedings recessed at 12:01 p.m.)

(Proceedings resumed at 1:30 p.m.)

MARK SEDDON: I hope everyone had a great lunch.

We have Dr. Torres-Roca from Moffitt Cancer Center.

JAMES FUTCH: If I may, for just a second. Dr. Torres-Roca is here today. I've been trying to bring this in for a landing about a year and a half, two years. We talked about this a long time ago at my request.

Dr. Torres-Roca practices at Moffit in radiation oncology. Also has affiliation with University of South Florida in the clinical side of -- I mean the academic side of things. And he has been involved with a group that's in a couple different institutions, and the subject involves genomic adjusted radiation therapy dose or radiotherapy dose.

And I ran across it, I think I started talking to Will Gibbons, who's the RSO who's talked to us before, after having read some papers. I think it

was in Lancet in 2021 or something like that.

And I'm gonna stop talking in a second, but I just wanted to thank him for being here today because I've very much been looking forward to this particular topic. And just a little bit of background. We've talked a little bit and hopefully you've met him already. We have some folks from different facilities, Halifax, we've got Barry University, Keizer University, University of South Florida. Bay Pines -- I still call it Bay Pines Medical Center -- nuclear power industry and Florida Power and Light and chiropractic radiology with Dr. Atherton. And that's us.

DR. TORRES-ROCA: I'm actually going to stand over here so that everybody can see me.

So I am, by training, a radiation oncologist and I have been at Moffitt for a little bit over twenty years. But I also have a background in genomics and I spent years in labs of immunology and genomic labs before I trained in radiation oncology.

And essentially, what I have been focused on doing for the last twenty years, is sort of to develop a new paradigm to treat patients with radiation, where we use biology to sort of optimize our radiotherapy doses and our radiotherapy

approaches. And I don't have to tell you guys, but I think it's important always to sort of like, you know, remember that radiation therapy remains the most common single therapy utilized in cancer patients in the world. Approximately -- depending on which country's numbers you're looking at, if you're using the U.S. about 60 percent of all cancer patients receive radiation at some point during their diagnosis and their cancer journey. And, you know, and it remains a very important curative, you know, approach.

There have been estimates that of all patients we treat and all patients that we cure, you know, for -- that have cancer, the reason we cure them, 50 percent of the time, is surgery, but 40 percent of the time is radiation. So this is why we use still radiation, because it's very effective and it's also very cost effective.

So sometimes, you know, people forget about all these things because all the emphasis of money and research really is on the chemotherapy and the immunotherapy, but if we actually learned how to use radiation a little bit better, and we actually improve our consultations by four percent or five percent, and you basically sort of, like, resolve

that equation across a million patients that receive radiation every year, you're talking 40,000 patients, 50,000 patients that would have better outcomes, you know, every year. And that's about the equivalent of, you know, just eliminating breast cancers. Breast cancer kills about 40,000 women in the United States every year.

So that's sort of the impact that we would have and very often people forget how important this field is, clinical speaking.

So anyway, feel free to stop me and hopefully I have the right thing here. Yep.

So I have disclosures. Usually in academic talks, we always say, hey, you know, I have some financial disclosures here. I have patents and stuff. And then these are -- I have many collaborators that have been associated with this work, but the two main collaborators are up here, Stephen Eschrich who is, for many years, the head of computer science at Moffitt and director of bioinformatics. He's my partner in crime in developing a lot of the models that I will discuss today.

And then Jake Scott, who is now a professor at Greenland Clinic, and Jake was my resident, and he

and I sort of developed sort of the second part of the technology. But there's been a -- and then Michael Kattan was a very well known cancer biostatistician who's done a lot of clinical models that are used particularly in prostate cancer; has been very much associated with a lot of this work.

So the idea is that today, the way we treat patients with radiation, is using a one size fits all. So generally speaking, what we do is we treat patients with standard doses that have been developed over time, you know, and basically, that's what we do. So the fundamental assumption is that every patient has the same opportunity to benefit, you know, from radiation.

And we know that cancer is highly heterogeneous. Cancer is the most biologically heterogeneous disease that we treat in humans. And this idea that everybody has the same likelihood of response or benefit from radiation is really wrong. We all know that from clinical experience, but we haven't replaced, you know, that idea and that approach of how we treat patients because we haven't replaced it, because the current paradigm sort of works.

So that's really sort of the background of how

I began thinking about this. And one of -- I'm not going to go through the details, but essentially, we developed a technology that we call the radiosensitivity index, which is a molecular diagnostic that assesses gene expression for ten specific genes. And basically has been trained to predict the cellular radiosensitivity initially in tumor cell lines and then eventually validating patients. And so the RSI proposes that radiosensitivity is not homogeneous, which is the current assumption in the field, but rather, that it is heterogenous -- sorry. I'm having trouble here. Okay.

But rather that it is heterogenous, right? And so therefore, you know, the potential of benefit for each patient from radiation is different. So if we start thinking about the idea that radiosensitivity is heterogenous, then you can imagine that if you give the same dose of radiotherapy to a patient that is resistant, you know, and the same dose of radiotherapy to a patient that is sensitive, that although the dose that's coming out of the machine, that physical dose that we can measure very accurately, is the same, right? The actual biological dose that each of those patients is

actually receiving is different. And so this is sort of the genesis of the genomic adjusted radiation dose, which is really a qualification of the biological effect of the biological dose that each patient is actually, you know, sort of receiving when they get radiation, and that's essentially, those are the few papers that we have in the labs at oncology.

So then the idea is if all this is true that then all of a sudden, you can quantify the clinical benefit, you know, of each patient, you know, from the radiotherapy; and therefore, you know, you can, you know, sort of figure out that this is actually specific to certain biological subpopulations.

In other words, that the clinical benefit of radiation is not uniform and as we start understanding who are the patients that benefit more than others, this is something that you can use, you know, in your process of designing the optimal dose for your patients.

So the idea is that, you know, biological phenotypes always have a distribution, right? And so I always make the comment that nobody would think about starting a shoe company and only make a size 8 shoe. Nobody would do that, right? Because you

would fail as a shoe company because, of course, we all have different size shoes. Well, but what we're doing in radiation is that we're just prescribing, you know, a size 8 shoe for every single patient, you know, even though, you know, there is a very well known biological heterogeneity that we still cannot quantify.

So the idea is that, you know, we propose that giving this same approach to everybody is a very inefficient solution to treating patients that are highly different in their likelihood of response to radiation.

So just very quickly, this is how we developed the, sort of the technology that is the floor of, of all these things. We use sort of assistant biology approach to identify genes that were good at predicting radiation response in cell lines. Through a process of analysis, we identified the biological network that included these ten genes, and then we proceeded to actually train the model, you know, using these ten genes. And this was originally published, you know, about fifteen years ago, you know, with -- in collaboration with Dr. Eschrich.

And this algorithm, this gene expression

algorithm has been sort of fixed since then, and I'm not going to go through the data, but this is the most validated, most clinically validated radiation sensitivity model out there in the field, and it's not me saying it. This is the EORTC, which is a European research organization. They published a consensus statement a few years ago saying that the RSI had, you know, sufficient, I think, sufficiently validated to derive level one evidence for their use in the tailored dose approach, you know, in some populations. And the last time I checked, there's about 21 different analyses across multiple disease sites in over 5,000 patients validating RSI as a biomarker of response to radiation, you know, predict the clinical outcome of patients treated with radiation.

So the idea is, of course, that if everybody is different in terms of their response to radiation, then the biological doses of radiation that we're delivering when we're delivering uniform physical doses are very different. So we think we're treating patients homogeneously, but in reality, we're not treating patients homogeneously. And I think the idea, again, is that what comes out of this here is very homogeneous, but what happens in

the patient is very heterogenous.

And I know there are clinicians in the group and all clinicians have seen this. These are three patients, treated homogeneously, same dose of radiotherapy but with very different outcomes. No toxicity here and then significant toxicity and then, of course, that's an example of normal tissue toxicity. The same is true with tumors where you have quite a bit of heterogenous response to standard doses of radiotherapy.

Essentially, what we did is that we integrated our model into the linear quadratic model. I'm not going to go through it extensively, but the idea is that by integrating our estimate of radiosensitivity for each individual patient, we can derive an actual genomic dose using the standard, the standard equation for effect that comes sort of from the radiobiology textbooks and then when we plot, you know, a modeling experiment where we have patients that normally receive 45 grade, others 60 grade and others 70 grade.

So physically, these guys are getting treated to a higher dose than these guys, but then when you convert to the biological dose, you see this very large heterogeneity sort of in the distribution of

where it's, yeah, it's true, most of the blue is down here. Sort of on the low end of the, of the bar. You still see GARD, you know, you still see blue over here, on the higher end, and some patients that are treated lower doses end up with higher GARD than some patients that are obviously more radioresistant, but that get higher doses physically.

So the idea here is that we cannot always assume that giving a higher dose results in a higher, you know, biological effect. You know, very often, the radiosensitivity plays a very important role in that biological dose that we're calculating.

JAMES FUTCH: Doc, one question.

DR. TORRES-ROCA: Go ahead.

JAMES FUTCH: So the numbers on the bottom of the GARD, those are GARD indicis values. That's not grade or anything like that.

DR. TORRES-ROCA: So this is GARD. By the way, GARD is unitless. There's no actual, you know, unit for, whereas this is, of course, grade. But when you actually put all these things into equations, the units cancel out. So GARD is technically unitless. But basically, we have a spread here that goes from one to a hundred and we only have

basically three blocks of doses here. But yet, look at all the heterogeneity that we can solve once we include the biologic.

So this is the paper that was being discussed. Initially, essentially, what we decided to do is, okay. You know, can we really test this idea. It's prescribing using this information, a better approach, you know, for patients, and again, we prescribed using physical dose, but we are making the argument that the biological effect is more important and this was an analysis that we did in over 1600 patients across, you know, a bunch, seven or eight disease sites and again, you know, if you look at it here -- let me point here where we need to go right here, yeah.

So the physical dose here, sort of lines up right here has a radio of one. So the physical dose, basically does not predict the outcome of patients. So the dose we actually delivered to the patients tells us nothing about what's going to happen to the patient. But actually, the GARD actually tells you, predicts for both the overall survival and the recurrence risk of the patients.

In other words, the biological dose tells you more than the actual physical dose that you're

delivering. So we made the argument that as a prescription parameter, it is superior to the current standard of care, which is just to use, you know, the physical dose.

So we think that by integrating this technology into our field, we really transform the field of radiation oncology into a field that is biology driven, that allows the personalization and the genomic prescription of radiation dose into patients.

So some of the things that we -- so this is what we're trying to solve. So this is our, sort of our, you know, shoe size distribution, right? This is basically 8,000 patients. The RSI measure grand by disease side, higher the RSI is resistant, lower RSI is sensitive. So actually, if you look at this, for the clinicians in the room, sort of lioma, sarcoma, melanoma sort of talk, are the more resistant histologies and that's consistent with what we think. And then at the bottom here you have cervical cancer, oral, pharynx, head and neck, which are highly rated curable, sort of at the bottom of the list, the most sensitive of the cancers that we treat.

But the key thing here is we don't have a

single rate of sensitivity. It is very heterogeneous. We have three fold, four fold differences between the most resistant and the most sensitive, you know, when you look at patients at the most personalized level. So then this idea of giving everybody the same dose, by definition, is not optimal. It might be optimal for a population and it might be -- it was really smart when it was developed back in the 1930s, but it's really a problem when you start sort of realizing that there is all this significant heterogeneity, this idea of giving the same dose, just doesn't make any sense.

So a lot of people ask me, okay, so how do you do this? How do you actually use this technology to prescribe patients? And there are a number of different ways in which you can use this technology. But you can just prescribe to GARD target. So basically, you can define an ideal GARD target where the clinical outcome of patients is sort of optimized and instead of prescribing the standard physical dose that you give everybody, you can try to calculate what is the dose that will deliver that biological dose.

So instead of delivering 60 grade, 70 grade, you say, oh, I want to deliver a GARD 30 or I want

to deliver a GARD 40. What is the dose that I have to give this patient in order to do that? So I will show an example of that.

Another approach is that, you know, sometimes reaching a GARD target may be difficult or maybe, you know, may interfere with normal tissue toxicity and there are other ways in which we can calculate, you know, changes in the outcome of the patient that are predicted by a model, you know, if you use GARD, right? So we can use GARD as a continuous variable, rather than, you know, just a standard single target. And then, of course, because now you can predict the outcome of patients and you predict the clinical benefit of patients, you can use this to actually design clinical trials that are more effective, more efficient, that can be completed quicker and that have a better chance of being positive and moving people forward. And I think that's one of the more exciting, you know, applications of this technology.

So here's a way to prescribe the GARD target. This is, you know, this is an example in non-small cell lung cancer. So this is the distribution of RSI in about 1600, you know, patients with non-small cell lung cancer. Again, kind of like my model with

significant heterogeneity. It is unlikely that would be a single dose that would be best for everybody. And then if you treat everybody with standard dose 60 grade, you get the same distribution, not surprisingly, with GARD, it's just the same. You basically have, you know, a very large distribution, three, four fold differences between the most resistant and the most sensitive, right? GARD is, you know, the other way around.

So when you then look at the clinical outcome of patients, then you notice that if you -- that the patients that meet this threshold of GARD 33 or above, have a superior outcome than the patients that were biologically under dosed, that had a lower dose of GARD. And so then if you, instead of prescribing a standard dose, you use GARD, and then you try to estimate the optimal dose for each individual patient, you can actually calculate for each member of the population, the ideal dose for each patient, which is represented by this blue line here. So it's anywhere from 20 grade to about 100 grade.

But then, of course, we all treat these patients uniformly, so the actual dose received by all these patients, as you can see, there are only

very few patients that are actually on the line of their optimal dose. Most patients actually receive much more dose than they needed or much less dose than they're -- that they needed.

So not surprisingly, given the same dose of radiotherapy results in, you know, up to 75 percent of patients receiving either more or less dose than they actually need. And, of course, that is something that should interest a, you know, council of radiation safety.

So this is the same data, but represented in a different way. Again, this is sort of like, you know, the distribution of the dose that we have, you know, calculated and then this is sort of the window of what the standard dose is, in the setting of post-operative radiation, and this is sort of in the setting of definitive, the range is a little bit different because these patients have not had surgery, but here it's anywhere from 30 to 120 grade.

So there are some patients that are predicted to have such resistant tumors that maybe we shouldn't be treating them with radiation, or maybe these are the patients that may be good candidates for carbon ions or maybe good candidates for carbon

protons if we can take advantage of the biological advantages of those approaches. So that was sort of prescribing GARD target.

Another way is we develop these tools and these thermograms that actually help clinicians understand if you have the RSI and the GARD for a particular patient, well, what can I do for this patient? There is no guideline or no GARD target that I can get to. And critically, in that study, we did show that GARD and radiation, the interaction was significant, so we're actually predicting the benefit of radiotherapy. It's not that we're predicting the outcome. We're actually predicting and quantifying the radiotherapy benefit that each patient derives.

So we developed these approaches where you have sort of a, you know, a distribution of the GARD that patients get, you know, distribution in a biological distribution. And let's say you have a patient that you give standard dose and achieves a GARD of 15 and this is, let's say, an endometrium patient. We are estimating that this patient will have a 75 percent of survival at five years, but if you can push the dose a little bit to, say, achieve a GARD 20, then we can quantify that this patient can have an

improvement of three percent. And again, for a single patient, maybe not that great, but again, if you're designing a clinical trial, this is the kind of thing that you can then, you know, power appropriately and you may find, you may look for the subset of patients that are more likely to benefit from your intervention.

And again, you know, the idea here is that two grade, is always two grade, is always two grade in the physical realm. But when you enter the biological dimension, you know, the impact of two grade is very different for each individual patient. And adjusting GARD for each individual patient is very different. Sometimes you can adjust GARD, no problem. Some other times, patients are too resistant and you have to really, you know, up the dose.

So then, you start thinking about this and you say, oh, now you're biologically optimizing. You can push the dose to the tumor and so forth, but what about toxicity? So then what happens is that then you have a competition between optimizing the dose to your tumor, right, and then the normal tissue toxicity of your, of your additional dose, if you're giving additional dose, but certainly, if

you're decreasing the dose, right, then you're, you're going to be decreasing toxicity.

So the idea is, is that you start thinking about all these things. Each patient also has a different toxicity box to achieve their optimal, you know, their optimal dose.

So sometimes, pushing the dose will increase the risk of side effects; and therefore, can, you know, increase the risk of -- sorry, this is going too fast.

So sometimes it can -- pushing the dose may increase the risk of side effects for individual patients to the point where it's not worth it, you know. But sometimes it is.

Basically, you can develop all these models to combine both what we predict the tumor optimization is doing with normal tissue and you can develop approaches to penalize the changes in toxicity for each individual patient.

So we've developed this penalized tumor control probability model based on our biological information, and you can use these models to then design clinical trials. And so this sort of approach, this is all in silico, but we decided to say if our models are good, do we predict, you know,

what actually happened in real life? Do our models actually predict what actually happens in real life.

So this is a famous clinical trial that was conducted by the RTOG in lung cancer 0617. And basically, patients were randomized between 60 grade and 74 grade and everybody thought that 74 grade was going to be better. Everybody. People were already treating to 74 grade at standard institutions and everybody was surprised to find that actually, 74 was not better; it was actually worse. So this was actually a shock to the team, to the radiation oncology world because again, everybody is coming from the perspective, everybody has the same potential to benefit from radiation. So if you give a higher dose, so of course, they're going to do better, right? Yet they didn't do better.

So then we asked our model what would happen in this kind of setting and we basically used our biological distributions to run this -- this is very sensitive. And so essentially, you know, our model predicts that 74 grade was actually going to result in no improvement of outcome of patients. And this is actually the actual trial here, one year, local control, you know, for each arm. And this is our prediction, you know, by our model, aligning within

the confidence intervals for both. And then this is the two year local control, sort of again, aligning within the confidence interval of what actually was seen. So our predictions of what actually happened were actually accurate.

But the key thing here is when we look at, well, why the 74 grade failed and when you actually look at the distribution of our optimal dose, the patients that are predicted to benefit from 74 grade sort of are at the end of this first mode of distribution, but just before the second mode of the distribution. So you actually have only a minority of patients, about 18 percent of patients, that are predicted to be, to benefit from this increase in dose, but the other 82 percent of the patients, basically, are just getting more toxicity, right? Because these guys, I already optimized. And these guys are still under optimized. But now you've exposed them to 74 grade and more toxicity and that explains why uniform optimization did not work in this particular case.

But our model predicts that if we actually identify these patients and we deliver them 74 grade, there's a significant opportunity for improvement. And then if you expand a little bit

and then you say, we're going to deliver 45 to 80 grade, you know, there's potentially a ten percent difference in what these patients can do.

So again, our model predicts that there is an opportunity that we're missing out by not giving optimal doses of radiotherapy to these patients and it's not small. I remind you, five, ten percent of a million patients, fifty to a hundred thousand patients that we could be curing more. You know, if this were immunotherapy, this technology would be worth, you know, 20 billion dollars. But it's radiation, so nobody cares.

So, but anyway, but that's okay. Because I'm actually a doctor and I care about, you know, how my patients do with radiation. Okay.

So the last thing that I'm going to finish here, is the -- this idea that you can use biology to actually design clinical trials that are more likely to be successful. And this is a problem in our field. It's been twenty, thirty years since we've had a positive, you know, clinical trial in radiation oncology, right? I think since the combination of chemo radiation versus radiation, I don't think we've had a positive trial. What we've had is a lot of negative trials and equivalent

trials in our field and that costs a lot of money, right? And I think, you know, it's an important thing how we can move this quicker.

So one way we can optimize dose is there are some disease sites that GARD predicts are under or overdosed. And so, it might be possible to still identify uniform strategy where you treat everybody the same and that, you know, and that you can improve the outcome of patients. And I'm going to show you an example of that in a moment, in soft tissue sarcoma, which is one clinical trial we have ongoing, you know, at Moffitt.

But in most disease sites, in most situations, you know, it is -- we need a personalized approach. So in most disease sites, GARD predicts that there is no uniform approach that would include -- that would improve the clinical outcome and that we really need to, you know, generate a GARD for each patient before making the decision. And we have two clinical trials ongoing at Moffitt, you know, with that approach, I will, you know, discuss in a moment.

So this technology is set up at Moffitt. We can order the RSI at Moffitt, you know, and a report is generated. It's only available under clinical

trials right now, but this is set up in the CLIA laboratory, so it meets all the regulatory requirements for a laboratory developed test. And we currently have three studies that are funded that are looking at validating GARD as an approach to change the outcome of patients.

So I've already sort of, I've already sort of, you know, explained that GARD can predict what will happen to the patients, you know, and once the outcome is done, but can we actually change the outcome of the patients by using this information in a prospective way so that we improve the outcomes of patients.

So I'm going to show you just one example, because we have early data. So this is from soft tissue sarcoma. And this is very similar to a tumor control probability curve to a TCB curve. But this is actually GARD. So this is, essentially, the distribution of GARD when patients are treated to standard dose. So very, a very common approach in soft tissue sarcoma, 50 grade given preoperatively. So this is basically what we get when we look at, you know, the distribution that we have generated for GARD.

Now, 50 grade has been shown to result in an 18

percent response rate. And so basically, if you look at your distribution, and you look at the 82nd percentile, right, in your GARD, you say these are the patients that are more likely to respond, and so your GARD target is 22.1, right? So that's how you would model this.

So then, if you increase the dose to 70 grade, this curve will shift to the right. And then now all of a sudden, you have a, you know, you have approximately 60 percent of the patients would -- are predicted to achieve this target.

And so basically, we designed a clinical trial saying that dose escalation in preoperative, you know, sarcoma, from 50 grade in 25 fractions to 70 grade in 25 fractions, would actually increase the response rate three times to the standard dose. And we had two, two hypotheses going. Because obviously, the hypothesis is dependent on this initial, what the baseline is. So 18 percent is what we had at Moffitt. But the actual reported response rate in the literature was actually closer to 8. So it was a range between 8 and 18.

So basically, our hypothesis was, we're going to improve it three fold, which can be anywhere from 26 percent to, you know, 60 percent. And basically,

we said we're going to design it on the lower end in terms of power calculations and so forth.

And so we actually have in this trial, as we did already, 15 patients. 13 patients have gone through resection. And at this point, we have 8 of the 13 have achieved more than 95 percent necrosis, which was the definite response that was identified for a 62 percent response rate, you know, that compares with our prediction of 58 percent. Two patients developed metastatic disease, you know, and did not go to surgery.

So this is the interim analysis and we have met the early, you know, termination threshold. So essentially, we don't have to finish the trial because the way we have designed this trial using GARD basically allow us to, you know, say it's going to be between 26 and 60, but we said, but we're going to power it to 26. It came out on the higher end of that; and so therefore, we have met the early termination, and we basically are done with this trial in two years after only 15 patients.

And I think that that's the idea is that now you can design clinical trials, you know, with this information, you're more likely to be successful and to know the answer quicker. So I think in many

ways, this is a new paradigm for radiation oncology, with now prospective validation of GARD.

I think the key idea here is that we, you know, radiosensitivity is heterogenous, we provide an approach, a molecular diagnostic that allows to resolve, you know, that heterogeneity of radiosensitivity. We have designed and developed an approach to calculate the biological dose received by patients, you know, and we have shown that that approach actually outperforms the standard approach of physical dose and that this allows you to quantify the clinical benefit of patients from radiation and immuno level and allows you to design clinical trials using this information that are more likely to be, you know, successful.

And so, I think that that's almost it, but we think, obviously, that this is the future of radiation therapy. You know, that this approach of one size fits all is biologically imprecise. Physically very precise, we know exactly what we're doing physically, but biologically is imprecise and it is suboptimal for the majority of patients. GARD resolves all those problems, you know, and allows the field to move forward into, you know, precision in volume.

That's it. I'm happy to take questions. I did it in half an hour so that -- (laughter).

MARK SEDDON: Thank you.

WILLIAM ATHERTON: Is the sensitivity and then the GARD all calculated based on the DNA of the tumor or the patient or both or --

DR. TORRES-ROCA: So it is calculated on the RNA of the tumor.

WILLIAM ATHERTON: Okay.

DR. TORRES-ROCA: Right? So it's really a metric of the tumor sensitivity there and so part of what we do is that we require a biopsy to be at least 50 percent or more tumor. A lot of people ask me is RSI predictive of toxicity and the answer is, I don't know. This is not being looked at extensively because there aren't good cohorts of data that have assessed, you know, toxicity from radiation that also have genomic information that would allow me to calculate RSI. So that's the main issue.

There is -- it has been looked at in at least one study, and in that one study, it was not associated with toxicity, okay? At least the tumor, you know, RSI was not associated with toxicity.

MARK SEDDON: So what's involved in trying to

implement something like that? Just to characterize RSI for patients. I mean, it sounds like clinical trials. How involved is it to set up a lab and do that type of analysis?

DR. TORRES-ROCA: So, yeah, there's obviously a laboratory component and then there's all kinds of regulations surrounding the laboratory component of that, right? And then there's the integration into the clinical trials and then the relay of the information occurs through sort of electronic systems, right? And then, of course, there's all the regulatory components of the actual clinical trials, right?

MARK SEDDON: Right.

DR. TORRES-ROCA: And then, you know, but the larger implementation then also includes a business dimension because then you have to find, you know, you have to develop the data and the case that this is something that should be reimbursed. And so because until, you know, you convince the Medicares of the world this is something that is important and that should be reimbursed, then it's not, it's not going to get out of my Moffitt, you know, sort of laboratory, right? And so I think it's very complicated because depending on your audience,

you're talking about different things, right? And everybody's got a hurdle to offer you. You know, in the clinic, they're different than in the laboratory. They're different than at the FDA. They're different from, you know, sort of the, you know, large, you know, insurance groups and then, of course, they are different from the actual users, right?

So I think it's an interplay of all the people that are involved that you have to convince to, you know, move this forward. But it starts with the science and if you're really addressing it. So I think we've got that covered, but the other parts we're still working on.

JAMES FUTCH: We talked previously and also listening to you today, we talked about the ten genes in the, working in the network, and you've got it, you've got the data to relate the index to an outcome for a particular kind of tumor. If you go back to clinical use, kind of where I think Mark had started to go, if it's you met all the requirements, when it comes down to taking a particular patient, you've got to have that genetic information for this particular patient.

DR. TORRES-ROCA: Correct.

JAMES FUTCH: How difficult is that? I know nothing at all about laboratory testing, Lab Corp. and all the rest of it. Is that an expensive proposition?

DR. TORRES-ROCA: No, no, no. We do this all the time for, for like, this is a molecular diagnostic and we do molecular diagnostic for a number of things in clinical medicine, right? So we sequence tumors all the time to decide on targeted therapies, whether patients should get immunotherapy or not and there are different ways of looking at that. And then, you know, there are other -- there's the famous Ungo type DX, you know, which was the original molecular diagnostic, which is basically a test that determines whether a patient should get chemotherapy or not in breast cancer, right? And so, that -- it's a -- so medical oncology is doing this, right?

There are companies that are -- I sit on the board of advisers of a company that there -- their business is to sort of collect all information that has been gotten for a particular patient and then filter that so that the clinicians can understand it, right? And so filter that through a school base algorithm. The clinicians say, okay, this patient

is a good patient for this drug or this drug. It's just that we're not doing it in radiation. Radiation is still not in the era of sort of genomic medicine. And so it's a -- I think the potential, you know, for the optimization of radiation by using these approaches, you know, is quite significant.

But it's not difficult. We're doing it all the time. The difficult part is setting everything up so that then people can use it, right?

So you have to solve all the issues, regulatory, reimbursement issues and so forth and then you got to get users to use it and all that costs money.

KATHLEEN DROTAR: So with GARD, you're establishing an optimum dose for the patient. Then when it comes to the treatment planning, itself, are you using the normal methods for that, establishing like a dose at death or --

DR. TORRES-ROCA: So what happens in treatment planning is that there is an additional module where we integrate all of our algorithms. So basically, you have a normal treatment optimization, you know it's all physically optimized, right?

KATHLEEN DROTAR: Right.

DR. TORRES-ROCA: And so it's physically

optimized to whatever the instructions, the physicians gave, right? In case of respecting the normal tissue constraints or, you know, achieving the dose you want to achieve.

But then what we do is we have an additional dimension, which is the biology for each tumor, and so basically, we can run an algorithm behind that that basically optimizes the outcome of the patient, right?

So we use our normal realms and say we can develop this alternative plan for that patient, right? And this is the predicted outcome. This is the predictive improvement for your patient if you were to use this, right? And so then we put it up for the physician to do. That would be sort of in the way we're envisioning it. So it would be sort of separate of the treatment planning.

KATHLEEN DROTAR: Right.

DR. TORRES-ROCA: So basically, the way would be like, you have a treatment, you know, you have a treatment plan with all your contours and everything. That would be exported into a module, biological condensation. That module receives that information, the biological information on that patient. And then basically can -- will run

whatever, you know, disease side algorithm we have.

And then we'll say, hey, this patient actually can get a really big boost in their outcome if you do this or sometimes you say, oh, you know, this patient is too resistant. We're not going to do much, so you either treat this to standard of care or you don't treat. You leave it to the patient -- to the physician.

KATHLEEN DROTAR: So do people want those higher doses where you're seeing -- because you had like nine, you know, and a hundred, are you going up to those and how you offset those?

DR. TORRES-ROCA: No, no, no. So one thing that's important that I remind everybody, is that all of our models sort of are developed with patients that were treated within the standard range.

KATHLEEN DROTAR: Okay.

DR. TORRES-ROCA: So I always caution people about sort of the, anything that is outside the range, because we really don't know, right? Because we really don't have data in that, you know, that set up. So these are all extrapolations that may be right, may be wrong. But we're predicting outside of the standard range. So we're -- but what's

interesting is that I gave a talk to the carbon ion, you know, international group in January, you know, the people from Japan and from European -- they all came to, you know, Jacksonville, to the Mayo. So I actually pulled some of the old lung cancer data for carbon ions, and it was fascinating.

I don't have that slide here, but basically, if you took our optimal dose predictions with the dose escalation that they did, and they went all the way up to equivalent doses of like 110, you know, back in the day, right?

And so, actually, their local control reported was almost like linear with what we predicted. It was kind of like scary of how close it was. It's obviously not direct validation, but I thought it was kind of interesting.

KATHLEEN DROTAR: Thank you.

DR. TORRES-ROCA: I mean, I think there's a lot of opportunity for carbon ions, right, riding that higher end of the resistance.

KATHLEEN DROTAR: You were talking about back in the day, but way back in the day, everything was erythema dose and everything's reaction.

DR. TORRES-ROCA: Now that's really, really, back in the day.

(Laughter)

KATHLEEN DROTAR: I'm old.

JAMES FUTCH: Kathy was at the controls, right?

DR. TORRES-ROCA: That is really, really back in the day, right? And so it's interesting that you mentioned that because --

KATHLEEN DROTAR: It was based on the patient.

DR. TORRES-ROCA: Yep. Because I, you know, there was actually some heterogeneity based on that because you would treat patients to -- until the breast would get red, for example.

KATHLEEN DROTAR: Right.

DR. TORRES-ROCA: But I always, I always asked the residents, so why do we now, of course, now it's changed, but I tell them why, why, why do we do 50 grade for a breast cancer, right? And they go like, oh, because of the NSABE BO whatever it is, 06, so forth, Bernie Fischer, you know, that was the study that established breast reconstruction therapy. I'm like, but why did Bernie Fischer design his trial with 50 grade? Where did that come from?

And they -- and, and the residents look at me like, I don't know. And I said, well, it comes back in the day, in the 1930's and 40's, breast conservation was sort of practiced in Europe,

particularly France, and they developed this approach to treat patients until the breast got red. And so that was the breast erythema dose. That was the real definition of red ED. You know, we figured out 50 grade was about the dose you need to get to that point. I said, that's the science our field is based on is oh, the breast got red. Okay, we gave enough.

So that's -- and that's still what we do today. Because we still do 50 grade and then now, of course, there are alternative approaches that were developed by testing against 50 grade, right? So now we do like the Canadian approximation, whatever it is, is 60 fractions, right? But it was tested to be the same as 50 grade. So that's a -- it's still the basis again, is not biology. It's really empiricism, right?

KATHLEEN DROTAR: Yeah.

DR. TORRES-ROCA: But that's before your time too.

KATHLEEN DROTAR: Oh, thank you.

DR. TORRES-ROCA: I've read all those papers and I know for a fact that that's before all of our time.

MARK SEDDON: How many other centers are doing

research in this area?

DR. TORRES-ROCA: So it's a good question. So, so obviously, the main hub is Moffitt, but Cleveland Clinic is involved with my, my colleague, Jacob Scott over there. And then there are centers that have been doing analyses of RSI. So there's a group in Hong Kong that has done probably the largest RSI analysis, triple negative, in all of breast cancer, over a thousand patients. And then there's a group in -- sorry. That's in Korea. In South Korea, of course.

And then there's a, there's a group in Hong Kong, you know -- I don't want to make any political statements, but you know, it doesn't take me a lot to do that -- but there's a group in Hong Kong that just tested RSI in samples of Phase III clinical trial in nasopharynx. I think the paper is coming out and the results were really good.

There are -- there is one grouping Manchester that has been in England that has been looking at RSI in bladder and prostate cancer. The data in bladder is mixed. They had one study that was positive; one study that is probably is a bit more powerful that was negative. And then, then they have data in prostate cancer that apparently is

good, but hasn't been published yet.

And, and then there are, and then there are other groups that I know are publishing. There's a Chinese group and there's a, in Sweden as well that has published about this and University of Kansas is also. So there's a lot of people. And my Italian friends as well. So there's lots of people involved in this.

MARK SEDDON: Very good.

NICHOLAS PLAXTON: I had a question.

DR. TORRES-ROCA: Yeah.

NICHOLAS PLAXTON: I can see how you would capture the people that are just underneath the regular dose. Are you using it at all to decrease the dose that you're giving?

DR. TORRES-ROCA: Well, so that's obviously one of the big uses is that, you know, is to decrease the dose. But I think most physicians will be scared of doing that, right? And they will -- are required, they will need to trust this and then I'm pretty sure that decreasing the dose will have a higher scientific hurdle, right? So it will require a probably, at least a good Phase II randomized trial, right? But you know, that's something that we can anticipate in the future. But there's a lot

of opportunity for optimization just in the range, right? And so we can -- that's what we aim to, you know, get started, right, is that in that range and there are a lot of clinical decisions that we make that sometimes are like, well, I don't know. We'll give them.

I already show you that the decisions we make about physical dose, they don't matter, right? Because physical dose doesn't predict the outcome of patients, right? Even if we do more or less. You know, in the normal whatever decision making we did, to justify a little bit more, a little bit less had no impact on the outcome, but it was really that biological impact.

But, yeah, I mean, there is a lot of interest in dose deescalation. In oral pharynx cancer, HPV. So uniform dose deescalation was shown to be a failure already. And actually, I didn't show that, but we actually, we did a genomic clinical trial design of their design and we predicted it was not going to work, but we did it before the results came out. But it's going to -- we didn't publish it, so anyway.

But there's also opportunities sort of in breast cancer, like triple negative breast cancer is

one disease that it's kind of odd, generally speaking. And the standard, the guidelines, the standard radiotherapy guidelines is you treat those patients with, you know, sort of whole breast radiation. Then you give them a boost to sort of the tumor bed. And so that's a, you know, and that's sort of standard. But we have found that if you're sensitive to radiation, then you don't need the boost. Those patients do extremely well with just standard dose and that is actually one of the trials we're doing at Moffitt, is just eliminating the boost. And we predict that about 50 percent of triple negative breast cancer don't need the boost. And again, that's not like a crazy, we changed the world kind of thing, but you've got to start somewhere to get some of these things, you know, lined up, right?

And then, but then we also, you know, but there are other subsets of patients that actually need more than the boost. And we're actually designing a dose escalation trial, GARD directed dose escalation trial that's actually going to be a Phase II that's going to be run by the NRG. So that's still in the political, you know, discussions. It's been proposed and it's going through committee and

committee. But it hasn't been rejected yet, so maybe, maybe in a year, we'll get it running again. We'll see how it goes.

But, yeah, I mean it's a -- so there's opportunities for, you know, sort of both. But, you know, I mean, the sarcoma, the sarcoma results are very persuasive. I almost like, I actually ran the calculations for the PI, like three years ago. And I sort of forget about the trial, because I said there's no way we're going to improve sarcoma response rates three fold. But I designed it and I completely forgot. And then, like, you know, three, four months ago, he said, hey, do you remember those calculations you run for me? And I'm like, no. And then he showed me, look. And I'm like, oh, yeah. And then, look, it's lining up exactly as these calculations and I was like, no, no, no, it was wrong. Do it again. Show me the data. And it's lining up, right?

And that's really the most persuasive of all the data because it's the idea that you can actually develop a testable hypothesis. And even, even if it doesn't work, at least you're going to learn something. Which is what I always say, you know, maybe there are better ways. I'm sure there are

better ways than this, but, you know, there's no way that what we're currently doing should suffice with what we know today, right?

That's a prescription approach that was developed in the 1930's. Very smart in the 1930's. Not so much in the 2020s. That's my view.

MARK SEDDON: All right.

DR. TORRES-ROCA: All right.

JAMES FUTCH: I'll talk to you after. All right. Thank you.

MARK SEDDON: Thank you, Doctor.

(Applause)

DR. TORRES-ROCA: All right.

MARK SEDDON: I think we have Camilla doing the machine.

CAMILLA GUY: Yes. So thank you, everyone. I'm going to be giving the machine updates instead of Lisa Gavathas could not be here today. She's the new environmental administrator --

CLARK ELDREDGE: Interim.

CAMILLA GUY: Interim, I'm sorry. It's not official yet. Soon, hopefully. But, yes.

So in terms -- I'm going to just start with the quarterly reports for all of the payments overall. So the first quarter, we had to start slightly later

than expected because all the renewals were not sent out due to processing from a third party that we were using.

CLARK ELDREDGE: What is this?

CAMILLA GUY: That was next.

JAMES FUTCH: What you're talking about is the data from the E-payment system or overall?

CAMILLA GUY: Yeah.

JAMES FUTCH: Just E-payments.

CAMILLA GUY: Yeah, I was going to mention it in the second quarter, because it posted initially in February.

CLARK ELDREDGE: Oh, you're talking about the actual --

CAMILLA GUY: I'm going by quarter.

CLARK ELDREDGE: Quarter, okay.

JAMES FUTCH: Okay. You said you were doing a quarterly report, didn't you? We'll be quiet.

CLARK ELDREDGE: Never mind us. Just say renewals went out late this year.

CAMILLA GUY: Renewals went out late this year, so no -- payments weren't really coming in as much, but inspections were being done.

We ranged about 1242 inspections out of the 2000 that were supposed to be and that just rolled

over into the next quarter. Second quarter we did receive a lot of more paper checks than expected, so we ranged about $2,402,000 in total. And overall, like in compliance, that was like 89.8 percent, so I'm happy about that. Where -- because I deal with enforcement violations; things like that. That's less stress for me in facilities overall.

And then ranging into the third quarter, when we had the online payment system posted where you can actually pay, not just look at what fees you owe and things like that. That we showed -- James showed that last meeting for everyone, that showed that fees are going to be posted up there. Payments are coming soon.

Well, in February, February 20th, it finally, like, launched. It did have a credit card fee of like two --

CLARK ELDREDGE: Two-and-a-half percent.

CAMILLA GUY: Two-and-a-half percent charge if you wanted to pay with card or you can still mail in a check. A lot of people are happy about that that were late. So that was good. And overall, I e-mailed you, there were 802 total transactions for payment and 952 revenue items. Some people owed a little bit more or their previous years never paid

or say e-mailed a check. The mail system is not efficient. Even if you mailed it, it's not on you or us if we receive it because it gets lost. Things get lost in the mail. As long as the checks weren't cleared, that's all that matters to me.

And in total, that was $97,501.02, and that's including the convenient fees as well.

And overall for the third quarter, we -- which is from January to March, that's an 80.9 percent in compliance. We're still trying to play catch up because during the renewal season, it was a lot of going back and forth, printing; things like that, so a lot of inspections were not entered but they were completed, thankfully.

And I have an example for the online payment system. This person is not in compliance. They have a violation of fees due for years, okay? But I just wanted to show overall, even it tracks -- it updates within a two-day turnaround time to update in the system. You can do e-check or credit card and pay like that. So that's just a brief example.

And overall, for the online system, there is no bulk pay. So say you have multiple facilities, like, HCA, Baptist, those type of hospitals, larger facilities, unfortunately, you're going to have to

go through each and every JR number and pay each one individually. That may change soon. But for billing purposes, if you want to pay online, it might be easier just to send in a check and break it down like that.

And you can view your machines in total and make edits by still filling in the 007, that is not electrically, but in the future, we hope to have it done. That is still pending, if possible. We thank technology, James' team for getting all this in play overall. We were the test dummy for materials possibly next. So they've had less of processing on their end as well.

That is all for payments and things like that. Am I missing anything?

CLARK ELDREDGE: There was something in there, but it slipped out of my head.

CAMILLA GUY: It can come back later. For enforcement purposes, I've had three medical events since we last met and one overexposure. The overexposure was they did a weighted dose. Thankfully, it was rectified. There's no issue with the physician.

The medical events, the first one was a wrong patient plan. It was caught immediately, but with

it being the wrong patient plan, it's still a medical event. It shouldn't have happened. We're working on that.

I've had an overexposure with a pediatric patient. It was more so for their reproductive organ. It was supposed to be protected and was not, so that is under investigation as well.

And then the last one, a saline leak happened during, for a mammo treatment and they're investigating why the balloon, itself, leaked. Everything, I have all written statements of what occurred on their end. It's now on the back end of finding out what happened and why.

And next, for mammo, the FDA rule for breast density law is going to be in effect in September, what changes, and at the same time, the state rule will expire the same day.

That is all I have for mammo. Nothing new. No medical events, thankfully, outside of that.

And we lost Clark as bureau chief. We have Lisa Gavathas as interim and we are hunting for a AF2 specialist, Regulation 2 specialist, and we have interviews next week for environmental consulting. We have two people interviewing for that. So hopefully, we will have a full staff. Yeah. We're

catching up, Kevin.

Other than that, in total, I have 20,842 facilities. 285 of them are new facilities. So we are receiving, people are registering like they're supposed to. And say they're not in -- we've caught somewhere, they are on the materials side. And inspectors let us know, hey, they are having change as well. They help them register them. So I'm thankful for the inspectors, what they're doing as well in catching things.

Overall, that's all I have. That's all I have. Are there any questions or concerns? Okay.

MARK SEDDON: Thank you, Camilla. Now it's James.

CAMILLA GUY: Do you want the clicker? Pass it down. Thank you.

JAMES FUTCH: Just a second, everybody.

MARK SEDDON: What's your timeframe right now on investigation?

CAMILLA GUY: Other than the wrong patient plan, I've been doing about a two-month turn around time. Once I get everything in, look it over, go back and forth with getting additional information that I need and then writing letters of if it's approved or we consider to go further.

The overexposure that -- the wrong patient plan, sorry, they, unfortunately, went bankrupt and were bought out and lost their RSO. So it was going back and forth trying to, trying to contact them so I can get updates and have everything changed also in their system. You have to have an RSO. You need to tell us within seven days. If you don't, that's a problem because every, um, seven days, you need to review all your reports and if you have no RSO, who is checking that if you're still running your machines entry patient, so --

MARK SEDDON: Yeah.

CAMILLA GUY: Okay. All right. Thank you.

JAMES FUTCH: Okay. Technology section updates. I will start with the vacancies. Programmer analyst has been vacant for eight or nine months or so. We have a candidate identified as going through the human resource process and hopefully have them employed by the end of May. So then we can start working on projects like E-payments and successors to E-payments.

We also have a vacancy in our administrative section, the person who does the travel, the purchasing, the laser registrations. That position is also vacant. It's gone through a couple

advertisements, not a whole lot of takers. So hopefully, we'll see some good news in the coming, coming months.

Let's see what else we have here. Oops. Not that, that's for sure. This is troubling when you touch your touch screen. Let's see.

CAMILLA GUY: Do you want to borrow the mouse?

JAMES FUTCH: That's okay. It is the time of year again when we're doing our annual CE approver report to the American Registry of Radiologic Technologists. We continue to be functioning as a CE approval state. I think having just been reauthorized last year for five years, which is a magical term for those of us in, in the retirement drop system, we -- the questions look to be the same as before, so we shouldn't have any difficulties supplying the necessary information to keep the national folks happy.

We have been informed that the Department of Health's website is going to be updated and from the scale -- I don't know how much of this we've shared internally, but it sounds like a pretty significant overhaul. I think it's, by the amount of outside contractor involvement that we've seen through the web section of our, of our central Department of

Health, it may look very different. And we have, just this past couple days, finished an evaluation of all of our Bureau of Radiation Control page assets and determined which ones we're jettisoning and which ones we're taking to the new website.

Actually, that proved to be somewhat useful because there was a lot of unlinked, old versions of Kevin's red guides and Clark's old information notices and things like that, which people like Adam probably still had links to from ten years ago.

ADAM WEAVER: Yep. You can still find them sometimes.

JAMES FUTCH: Why is Adam applying on an application that's not been approved for ten years to use? That's why. So some little house cleaning that's going to happen there. That's a good thing. We're not able to really even tell you remotely what the new site will look like at this point.

CLARK ELDREDGE: I probably shouldn't say this in public, but you see certain flashy sites these days that really don't tell you much, and I've got a fear that that's what we're going to go to. Because the actual current site is very functional. It provides information in a very effective manner. And we need to be providing information in an

effective manner rather than a lot of scrolling graphics and glitz, you know.

JAMES FUTCH: Next topic -- no questions on that.

Council vacancies. We have two members whose terms are expiring in the month of May. And we've gotten the materials from them -- that's Dr. Plaxton and Dr. Cognetta, who couldn't be here today. We've gotten the materials from them that we need to submit for consideration by the State's Attorney General's office to reauthorize for another term. Thank you very much, Dr. Plaxton, for wanting to participate. And the same for Dr. Cognetta.

We have three positions that are vacant, which is kind of timely because Mark was the, the basic machine operator position, which has been vacant since Mark was in it. It's very hard to fill that position. There's only 3500 or so basic machine operators in Florida. It can be filled by a physician who employs a basic machine operator, but that's -- we've gone through Florida Medical Association and the PA society and gotten no responses.

So we're going to see if Mark's got the interest. You've heard this before. We're going to

have a conversation.

The radiologist assistant position, same story. If anybody knows of a radiologist assistant that would like to serve out of the 36 active folks that are out of the State of Florida, three of whom used to be in the position, we'd be more than happy to listen to that. Anybody who wants to apply for that position, you can go to the council page and click on the application and submit yourself, if you're in that position.

And I should have explained, that's a member of the public position. Dr. Cognetta is in one of those. We have another one, that one we actually have very good prospective candidate in a name and an application, and that package is almost ready to, to submit through Clark and have him take a look at it. And that lady is a nurse practitioner currently with the University of Florida who has expressed a desire and seems to be a good candidate, from my perspective anyway.

So anyway, to sum it up, if you know of an RA, let us know.

Enforcement data. Let me pop over here for a second. This is a summary of, in this case, since July 1st, this is information on enforcement cases,

investigations. Cases active, we had 68 as of July 1st, the beginning of this fiscal year. Last July. Since then, through really yesterday, we've opened 44 new cases; closed 55.

When I say we, this is through my office, some from Kevin, some from Clark. These get submitted into the Division of Medical Quality Assurances system for evaluation and then prosecution. So current cases as of today is 57 cases. That's actually 50 individual Rad Techs; three employers. And the balance of that is people having more than one case open against them. So that's why it's 57.

And this is a breakdown for what it looks like in terms of type of infraction in no particular order. The licensure fraud from -- when folks come through, this is one of the professions that is not fingerprinted. So you report what you want to report. And what happens is sometimes people don't tell us about crimes that are in their past. And then they go to work at a hospital or other facility that's licensed by AHCA, the Agency for Health Care Administration. And the background screening that they do at the facility shows a crime and then it goes to AHCA and we have to do this whole, grant an exemption to the person so they can continue working

in that profession if we, if we feel they don't present a threat to public health and safety.

And honestly, sometimes people, you know, it's, it's things that happened 20 years ago. Maybe they forgot to tell us, I don't know. But we, we routinely will submit them to MqA to evaluate for possible discipline because technically, they committed a fraud in obtaining a license without telling us because they have to answer yes or no to background history offenses. So long way to go for three cases out of the fiscal year that we're in right now.

The next three are just straight discipline, convicted for a crime against a person. Conviction of a some other type crime. The category 11 there, those are the ones that have been acted against by the national registry. And then because of that, they violate one of the discipline standards in the Florida Statutes that says, being acted against by a national registry or another state jurisdiction. And then we have to evaluate whether or not to take the same action against them.

The next couple are the unlicensed activities that are reported either by our inspectors or sometimes straight to MqA by fellow employees,

disgruntle ex-spouses, who knows. And that's where the three employer cases are and the six operator cases.

The next one is final order non-compliance. So you've come through one of these others, you've been through prosecution, you've been found to, to need discipline. It's been imposed by the department and you're supposed to do certain things. Sometimes it's a fine, sometimes it's something else and you have failed to do that.

So this is coming back again for another round through the legal system on our side to make them do what they were supposed to have done the first time. So they're in non-compliance with their final order.

And then the largest category, of course, is unprofessional conduct. It's the largest category, but because it's pretty much everything including the kitchen sink that you may have done in the course of your practice, that is actionable. So you committed some sort of a sexual -- doesn't necessarily have to be one that resulted in the legal system. Maybe the facility fired you for unjustified touching in such a way that the department also feels that needs to be disciplined.

Falsified records in the profession, surprise

surprise, six different ways to either steal drugs, in the next category. Be working while impaired with drugs. Have been referred to the department's impaired practitioner provider because of your impairment and you have now not complied with their recommendations for treatment or withdrawal from practice. So 12 of those in the fiscal year.

And then just every other kind of unprofessional conduct. Eleven of those. And then I love it when Kelly puts two down, however many it is, unknown. I usually attribute these to, hey, this just came in. We're still trying to figure out exactly what this is, you know, and properly categorize it. Otherwise, it will go into other after unknown.

But trust me, there has to be a statute some place or we can't take discipline against them.

Any questions about the enforcement situation?

CAMILLA GUY: For the impaired program that they have --

JAMES FUTCH: Right.

CAMILLA GUY: -- how do they, like they -- does each facility have their own processing, where their nurses --

JAMES FUTCH: They certainly do. When it

leaves the facilities level, and either the person self-reports -- there's two organizations. One is just for nurses, we call it IPN, Intervention Project for Nurses. And the other one you see here is Professional Recovery Network, that's PRN, for the other professions. The statutes that these operate underneath say basically, if you self-report, the facility does something, maybe fires you for some impairment, you can self-report to one of those organizations and by law, we can't take any action against you. In fact, they will not tell us that somebody is with them as long as they're in compliance.

CAMILLA GUY: Okay.

JAMES FUTCH: So they'll do an evaluation with an addiction physician. He'll say alcohol abuse, you know, whatever it is, et cetera. And then they'll come up with a plan of action, contract they have to sign. It usually involves monitoring for a period of five years, drug testing. And if it's a really bad case, then they require you to attend not just outpatient, but perhaps inpatient care.

It's a very costly thing and people sometimes also don't comply because they can't afford it anymore.

Any other questions on that? All right. Enforcement data, what's next? Let's see. Oh. Legislative updates.

So the legislative session just happened and there are a number of bills that came out that affect a variety of professions in many different ways. And the way I'm going to handle this one today is, the Department's Division of Medical Quality Assurance, has a website here at this address, which I will show you. This is it. If you didn't know about it, it's an excellent place to go and find out what's going to affect your particular profession or all professions if you're licensed by the Department of Health. And you can actually search it. You can go back to previous years and say when did that -- how did that get started, and you know, what effect did it have.

These are the House and the Senate bills. In order to get to this site -- let me just show you one of them. Controlled substances sounds interesting. That's a pretty short one. It will show you a little short snippet about the summary of the bill's effect. It will give you a direct link back to the legislative sites to find out more information, and will tell you the effective date,

it tells you a little more information.

Oh, yeah, this was a huge bill. I think this particular one was one of the ones that the Senate president was very much in favor of this year because it had some very meaningful things to -- in health care.

So you can see the summary. This one is quite extensive. It talks about limited licensure for recent graduate assistants, et cetera, et cetera, et cetera. I'm not going to go into that. It's not our area, but I wanted to show you this site.

The process here is that not all the bills that passed both houses of the Legislature have made it to here yet, and that's because the way the process works is, it hasn't necessarily been signed by the officers and presented to the Governor yet and so certain clocks haven't started ticking yet. When that happens, he can either veto it or allow it to become law without his signature. Once it becomes law, either with his signature or without it, then MqA will put it on this page.

And so, for example, if you were -- let's see. I think this is the page here. This is a list from the Governor's website that shows all of the bills -- and I know you can't see that, but trust

me, it shows all the bills and various dates about when they were presented and Governor's date to act on it; what the outcome was. The ones in red were the ones that were vetoed.

So once it gets presented, it will end up here and then they'll end up on the MqA website.

So there are two bills that are of general interest to many professions, and one of those that's not yet here and it's not yet on the other site, if you go back to the legislative site, you will see -- let's see. Senate bill, bill actions. Okay.

This Senate bill, this is the Senate site. And this page shows you the history of what happened to this particular bill all the way through; various other tabs if you want information about it.

But what I wanted to show you about it is at the very end here where it says ordered, enrolled here, that means it passed both of the chambers and it's on its pathway now to go through the rest to the Governor's office, eventually.

This line right here that says signed by the officers and presented to the Governor, this is the part that hasn't happened to these other two bills that I wanted to mention. One of them is this one

here: Senate Bill 1600, and the other one is this one here, this is House Bill 975.

This particular one implements -- right now in Florida, there are not required fingerprinting for all professions. In fact, it's relatively few professions. You know, doctors; people such as that. This particular bill implements it as the subject, you can see there, that's the legislative summary. And a subset of this information, perhaps all information, will be when this finally gets through to the MqA site through the Governor and through the MqA site, this is where they'll build that from which you'll see on the MqA site.

But this bill implements required background screening, which means fingerprinting, for a lot more professions. So your facilities that employ, for example, medical physicists right here, medical physicists are in there, opticians, physical therapists, et cetera, et cetera. This will be coming, coming to those as well.

The Rad Techs are not in this. This is, this is another one that -- this is one that affects the ability to become licensed in Florida through endorsement. They don't list the professions here, but this one also has a great deal -- a large number

of professions, and the Rad Techs are not in this one, either. And I think that's where I'll leave it.

Any questions about --

CLARK ELDREDGE: The Rad Techs were originally in this one.

JAMES FUTCH: Yes.

KATHLEEN DROTAR: One of the reasons we're not included in that is because the radiologic technologists that we have already have statutes for endorsement.

CLARK ELDREDGE: There were actually -- the bill actually eliminated all endorsement options. It just made a standard one for everybody to, quote unquote, simplify it. The problem with that, Rad Techs, now, okay. But, yes, there were, there were concerns about how it was --

KATHLEEN DROTAR: It would have affected all of our graduate students because that's how they enrolled. It was a requirement for employment for a number of, for like three out of the four years prior, that was a, you know, a glitch. Anyway, it's not there, so we were happy.

JAMES FUTCH: So that's, I believe, all I have unless I've forgotten something. Anybody tell me?

MARK SEDDON: I have a question.

JAMES FUTCH: Go ahead.

MARK SEDDON: So I know we brought up before in the past, fluoroscopy for speech-language pathologists, and we can't say it's something that's under consideration as far as how we work around that. It's also come up recently, actually it may be timely since we are considering adding a nurse practitioner to the council. I know we have the, twenty years ago was that PAs were given sort of an exemption for fluoroscopy when you had the -- was it about twenty years ago we had the whole thing with the courts and Attorney General involved. Do you remember that?

JAMES FUTCH: I don't.

MARK SEDDON: You don't? It wasn't you. It was a conflict between supervision where a PA or the person who works underneath the radiologist was allowed to do everything they can do by the Board of Medicine but yet regulations from the department says only practitioners can do fluoroscopy. There was actually a court ruling.

JAMES FUTCH: Yeah. Actually, let's move on to new business. I think Kathy had something to --

MARK SEDDON: Sure. I'll wait.

JAMES FUTCH: No, no, it's fine. No more questions about the technology stuff.

So from my perspective, and you may have been a court case but from my perspective, the PAs and the nurse practitioners, when I first started, we were not considered to be underneath Chapter 468's exemption, if you will. That applies to doctors, in terms of yes, you can use x-ray, if you are a physician without having to be licensed as a technologist psychologist. But in going through inspections where we would find people, PAs, nurse practitioners, we would, we would site and this percolated up through the two societies. Mostly the PAs society.

And the lawyers at the time, looked at our definition of licensed practitioner, which was, you know, like a paragraph long and noticed that there was, in addition to a list of allopathic physician, osteopathic physician, chiropractic physician, et cetera, et cetera, et cetera, the very end of that definition said or someone who is otherwise authorized by law to practice medicine.

And they looked at it and said, well, you've just listed all of the people who are actually authorized by law to practice medicine in a variety

different disciplines of medicine. And what does that mean? What does those who are otherwise authorized by law to practice medicine. And they said, oh, let's ask the Board of Medicine, and let's ask the Board of Nursing.

And we asked it in the context of working for radiologists. And what the boards respectively said was, yeah, that means PAs and that means nurse practitioners.

Now, that's the 30,000 word summary of what was a multi-year process whereby somebody tried to go to the Legislature and got the Legislature to try to define things differently and they were not able to secure any sponsors, I guess, to do that.

They, themselves, went to us and asked us to make that clarification; make that determination. And we said, by us I mean the Department of Health. And we said at the time -- Clark wasn't there yet, but we said, we can't interpret statutes. We're sorry. If it's a regulation, yeah, but we don't interpret statutes. We're not allowed to do that.

Those particular folks who -- well, it's more involved than that. But that's how we came to the place where to this day, if you go in and an inspector sees the physician assistant performing

fluoroscopy, we don't cite for that. If they see a nurse practitioner, they probably won't. But they may ask does your written protocol cover that. And honestly, we haven't kept up with all the ways that nurse practitioners have changed since 2000 or whenever that was, 2004. They may not have written protocols anymore. I don't know.

We used to encourage them to put x-ray on the written protocol if their protocol physician wanted them to do what it was they were doing. Of course, now we have the, what do we call, the autonomous nurse practitioners. So we're not going to cite for that.

That's how that came to be. But you see that there was a, there was a statutory hook --

MARK SEDDON: Right.

JAMES FUTCH: -- that appeared to, I mean, logical common sense, what else could that mean? I mean, we couldn't -- could you all think of what else that might mean? Otherwise authorized by law to practice medicine. You just listed all the people that practiced medicine. That was pretty obvious.

I think it would be, let's just say, if speech-language pathologists would somehow end up in

that definition, then clearly, the outcome would be the same.

I will also say that as we know, one opens -- well, that's a -- that's above my pay grade and it requires more money than my pay grade to have that happen. And sometimes, when you ask for a statute to be open for one purpose, a whole lot of stuff comes in. It has other effects, you know.

But in terms of the speech-language pathologists, I mean we have council meetings coming up if -- I don't know how to make it happen. It seems logical from my perspective that they know quite a bit about how to do the swallowing study and what they want to see and all the rest of it.

I'm not a practicing tech. You guys are, one's a medical physicist so you know far more about it. if I could make it so, I would probably do so if the council were to vote on that at some point in the future. But even if they were, it's not going to change anything because of the way the law is written.

Now alternatively, you know, some professions, in their practice acts, they get things put in there that says something to the effect of notwithstanding the effect of any other statute to the contrary,

yes, we can use x-rays for swallowing studies. That's how dentists are able to administer x-rays and dental hygienists are able to administer x-ray. Notwithstanding the clause in those statutes. Sometimes it's a little more direct than that. It will say, notwithstanding Chapter 468 part four to the contrary. That's how that works.

MARK SEDDON: Okay.

JAMES FUTCH: Yeah.

MARK SEDDON: All right. Thank you.

Any new business then I guess. Kathy.

KATHLEEN DROTAR: So if you remember a couple of years ago, the council recommended that the Department of Health adopt the plastic standards, the ASRT practice standards for the standards that were to apply to technologists in Florida.

Since that time, there have been a few changes and --

JAMES FUTCH: You mean the radiologist assistant.

KATHLEEN DROTAR: The radiologist assistant changes have been updated and some of the requirements for the registry have also changed.

So what we've -- what I wanted to put out was, if the council wanted to look at the new standards

and apply them to the, to the -- what is it, our regulations.

JAMES FUTCH: Yeah. So when it comes to radiologist assistants, this was a nationwide push by AART in many states several years ago -- 2005 or 6.

KATHLEEN DROTAR: 2010.

JAMES FUTCH: Maybe a little bit later. And in Florida, it was a major project for the Florida radiologic society. Dr. Peterson is not here. Dr. Scheckman is not here. Those are the two members who are here because of FRS nominations in the past.

When that came in, in 2005, because there was -- a radiologist assistant is a physician extended. It's not one based on the Board of Medicine, it's not one based on the Board of Nursing, but it is a physician extender for the radiologist, which is why FRS was supportive of it.

The -- I'll spare you all the history of it. For a long time because of reimbursement, perhaps other issues, it maybe wasn't as popular as we -- as everybody thought it would be.

Nevertheless, when it became law back then, the statute was written so basically, it was kind of

hard coded. You come in by endorsement with a national license from AART as a radiologist assistant and the scope -- I forget the exact wording, but the scope of practice is, is that to which the AART -- I think it was ACR and one other group, might have been ASRT, have agreed to for the profession.

So we had to kind of cobble some stuff together, and it was a brand new profession, and AART came out with a very detailed, specific practice standard. I mean, one you could actually read and figure out what you were able to do. Unlike most of them, which are somewhat amorphous, kind of allowed to have some wiggle room and interpretation.

And not only was it specific in terms of, like down to the duty, this particular kind of fluoroscopic procedure, it gave a level of supervision which was personal, general or direct for each individual procedures.

Since then, I think the industry or at least, ASRT and AART, have moved to a more generalized, more typical practice standard, which talks about an overall level of supervision. I forget. I haven't read it in a long time. It's either general or

general as decided by the, you know, the supervising radiologist. Kind of like, kind of like the PA. Yes, the PA can do these things with the appropriate training and skill and supervision as provided by the supervising physician.

So we've -- I've always been open to changing that. But what has, what has delayed it is the practice standard at the national level was, was combined together. So you have a practice standard which has general duties for all the different medical modalities, so for the radiographer and the radiologist assistant, et cetera, et cetera, even the therapist. This is the general duties and then here's the specific things that the radiologist, for example, can do.

So that, getting that implemented and replacing the current one, what I really need to make this work, is a practice standard specific to the radiologist assistants. So we can say, okay, we're not touching any of the other professions. They've got their own practice standards. We're going to just touch this one and replace it with this.

It will probably still be a two-year process, maybe three or four if it's Kevin's rules, but it's doable and it's worth starting, and I'm fully

supportive of it and I'm sure Clark would be, too.

But what's happened recently is that Kathy believes she can actually get this, this kind of specific document that we need --

KATHLEEN DROTAR: Yes.

JAMES FUTCH: -- which should make it a lot easier.

KATHLEEN DROTAR: I'll be happy to get that. And just to, FYI too, the radiologist assistant is an AART, who then has a Bachelor's degree and post Bachelor's level for the RA. And last year, we had 37 in Florida. I don't know what the number is this year, but it was 37 last year. It was the most of any state in the United States.

JAMES FUTCH: We just went through talking to MqA. I'm sorry. We're over time. We just went through, we actually got a brand new one, like last week or the week before. I think we're up to 38 now, whatever it is. And he actually got licensed with the wrong, wrong length of time.

KATHLEEN DROTAR: Yeah.

JAMES FUTCH: Supposed to match him up to his current RT license. Somehow he had one license that's renewing in the even years and one license renewing on the odd number years instead of having

them at the same time, but they're fixing that.

KATHLEEN DROTAR: Good.

JAMES FUTCH: That's it for my perspective. So I very much thank you for working on that. And that will be great if we can, if we could do that.

KATHLEEN DROTAR: I'll get it to you this week.

MARK SEDDON: All right. I think we're at -- almost out of time. We need to pick a date for next meeting. So let's look at the calendar in the back here. Do you know what we're targeting?

JAMES FUTCH: Usually we go middle of September, I think. Second or third week of September. Something like that.

CAMILLA GUY: I shoot for September.

MARK SEDDON: Last week of September?

JAMES FUTCH: It's always usually, nine times out of ten it's May and September. Once in a while we have to push it to October, but we try and stay in the second and third week of September.

MARK SEDDON: Does anybody have any issues with the second or third week of September?

KATHLEEN DROTAR: No, not now.

MARK SEDDON: Not right now.

JAMES FUTCH: Well, that's the point. We plan ahead. Now usually -- so if we say -- I don't know.

This is the council deciding where you all want to meet. We've been doing Tampa for a number of years. We used to go back and forth. Everybody seem comfortable with Tampa? We traditionally pick a Tuesday or Thursday. So if we look at the second week, we're talking the 10th or the 12th. Does anybody have any specific reason to pick one or the other? Any college-related stuff, any society meeting related stuff?

ADAM WEAVER: I don't know football schedules yet.

JAMES FUTCH: Don't know the football schedule yet?

WILLIAM ATHERTON: I like the 12th better only because it's a Thursday.

JAMES FUTCH: Does somebody want to make a motion?

MARK SEDDON: Do you want a motion for September 12 as a --

WILLIAM ATHERTON: I move the 12th, yeah.

KATHLEEN DROTAR: Second.

MARK SEDDON: All in favor?

ALL: Aye.

MARK SEDDON: All right. There we go. September 12 is the targeted date for the second

meeting of the year.

All right. If there are no more questions, comments or any other business for the council, then we'll go ahead and adjourn.

(Proceedings concluded at 3:10 p.m.)

CERTIFICATE OF OATH

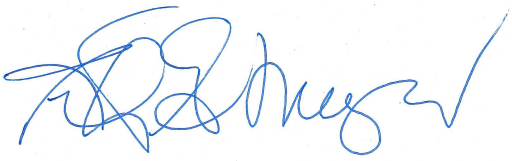
STATE OF FLORIDA:

COUNTY OF ORANGE:

I, RITA G. MEYER, RDR, CRR, CRC, do hereby certify that I was authorized to and did stenographically report the foregoing proceedings; and that the foregoing transcript is a true and correct record of my stenographic notes.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties, attorneys or counsel connected with the action, nor am I financially interested in the outcome of the action.

DATED this 31st day of May, 2024.



RITA G. MEYER, RDR, CRR, CRC