SPENT FUEL SOLUTIONS INFORMATIONAL WEBINAR:

INTERNATIONAL BEST PRACTICES

Via Zoom

TRANSCRIPT OF MEETING

March 23, 2023

SPENT FUEL SOLUTIONS INFORMATIONAL WEBINAR:

INTERNATIONAL BEST PRACTICES

Transcript of video-recording meeting via Zoom commencing at 8 a.m., Thursday, March 23, 2023.

WEBINAR SPEAKERS:

CHRIS WAHL - (EXECUTIVE DIRECTOR OF SPENT FUEL SOLUTIONS)

CLAES THEGERSTRÖM – (OWNER OF THEGERSTRÖM CONSULTING AB AND FORMER PRESIDENT OF SWEDISH NUCLEAR FUEL AND WASTE MANAGEMENT CO.)

JIM DESMOND – (SUPERVISOR, SAN DIEGO COUNTY)

KATRINA FOLEY – (SUPERVISOR, ORANGE COUNTY)

LISA FRIZZELL – (VICE PRESIDENT OF COMMUNICATIONS FOR CANADA'S NUCLEAR WASTE MANAGEMENT ORGANIZATION)

MIKA POHJONEN – (MANAGING DIRECTOR OF POSIVA SOLUTIONS OY, IMPLEMENTER OF FINLAND'S ONKALO SPENT NUCLEAR FUEL REPOSITORY)

CHRIS WAHL: Good morning.

I want to be timely, so I'm going to get started.

Hello and and thank you to our panelists for joining us today and welcome to our first quarter webinar for Spent Fuel Solutions.

My name is Chris Wahl, I serve as the Executive Director for the coalition and I will also serve as the moderator for today.

We appreciate our attendees and our speakers taking the time to be here with folks.

We're about to learn about more spent fuel repositories that are being developed internationally, something that's near and dear to our heart as we tackle the question and the and the challenge here in California.

Our webinar's gonna begin with a brief presentation from our panelists, followed by a few questions.

If you do have a question, please leave it in the chat along with the name of the speaker you are addressing, and we'll do our best to get as many questions as possible.

Before we move into the presentation and the panel discussions, however, I'd like to recognize our coalition

cochairs Supervisor Jim Desmond.

Jim, you can take out a wave there.

Thank you so much.

And we have our newest, our newly minted cochair, Orange County Supervisor Katrina Foley, who we're pleased to have as well.

I believe she's just running a couple minutes late.

For those of you not in Southern California, we are experiencing rain, which is something that we don't get very often.

And so that tends to lead to a lot of problems on our roads.

But both the supervisors do represent the districts that include and are immediately adjacent to the San Onofre Nuclear Generating Station here in Southern California.

And their leadership is absolutely critical to our advocacy efforts as we look for that long-term solution.

I'm going to first turn it over to Supervisor Desmond.

He's going to say a few words about what we've been able to accomplish in the short time period that we've been formed, as well as some of the things that we're working on for the future.

Supervisor.

SUPERVISOR JIM DESMOND: Hey, Chris.

Well, thank you very much and I want to thank everybody for joining us.

When Spent Fuel Solutions launched two years ago, we knew that making an offsite storage and disposal a reality would, was going to take a great deal of time and effort.

And however we remain hopeful and focused and it's expanding our membership, raising awareness and educating the public about this very important issue.

So our coalition now we have over 250 members including local governments, elected officials, business and labor leaders, environmental non-government organizations, Native American leaders and and many more.

Today we have reason for optimism.

A consent-based siting process for federal consolidated interim storage facilities is in the early stages thanks to the U.S. Department of Energy.

I also want to thank the Representative Mike Levin, who formed a spent fuel solutions caucus in in Congress and his new cochair, Representative Chuck Fleischmann of Tennessee, you know, proof that we've got bipartisan champions in Congress, you know, supporting this effort.

But we still need to get more people's voices to be heard and to be part of this.

So I would encourage everyone to visit our website at Spent Fuel Solutions now and join us as a supporting member as today's speakers are going to show that spent fuel solutions are possible.

We just need to take a broad based coalition and of supporters to advocate and to get the voices heard with a unified voice to get spent nuclear fuel and proper storage facilities.

So thanks again for being here.

Thanks for your interest on this important topic.

Back to you, Chris.

CHRIS WAHL: Thank you Supervisor.

We really appreciate your support and all the support that we're receiving from the different elected officials and stakeholders throughout the region.

You know, I'm, I, I'd like to take a second and pat ourselves on the back.

We're, we're well over 200 members now strong.

And when we started, it was just a couple of us and Supervisor Desmond was a, was a true champion starting with us from the very beginning.

So thank you very much for your continued support.

It's crucial and one item that that we were able to do well out of the gate, which was a big accomplishment for us was that the County Boards of Supervisors both in

Orange and and and in San Diego unanimously supported participation in this organization, which has served as the foundation of the bedrock to what we've been doing today.

So I believe Supervisor Foley is still on her way.

And so what I thought I would do is I thought I would start on some of the introductions and hopefully she can say a few words perhaps after our first speaker.

So I'm pleased to introduce our panelists today.

During our last coalition webinar, we heard from the Department of Energy for those of you that are participating say you might remember about their first steps and moving forward with a consent based process siting for federal consolidated interim storage facilities and under the new administration there has been a lot of progress at the Department of Energy and we're excited to build on on that momentum as but but as we look at what we might do here in the United States, it's also helpful to look towards international best practices that are under way.

The Canadian, Swedish and Finnish programs have made a lot of progress and show that spent fuel solutions are possible and can provide valuable, useful lessons for the United States to to take advantage of.

Today we are very honored and pleased to present

three current and former representatives from these programs.

Lisa Frizzell, if Lisa, if you could wave to let folks know, there we go, is the Vice President of Communications for Canada's Nuclear Waste Management Organization, or NWMO.

She brings extensive experience in the energy sector and has been with NNWMO for more than 12 years.

Claes Thegerström, Claes, if you could raise your hand too.

Thank you so much sir, is the former president of the Swedish Nuclear Fuel and Waste Management Company and now owns Thegerström Consulting, providing his experience to other countries' spent fuel management programs.

As we know, this is a global issue and we're very excited to have Claes to be with us to, to share what he's been doing in, in Sweden.

And then Mika Pohjonen, if you could raise your hand, sir, thank you so much, serves as the Managing Director of Posiva Solutions Oy, I hope I got that right, I apologize if it didn't, the company implementing Finland's Onkalo spent nuclear fuel repository, the world's first repository for spent nuclear fuel.

Onkalo is expected to begin operating in 2025.

It's just right around the corner.

Ok, with those introductions, I'm gonna kick it off to Lisa.

Lisa Frizzell is gonna provide us an update on the current status of NWMO's efforts.

And when she's done speaking, hopefully the Supervisor Foley will be able to present a little bit as well.

So I'm gonna kick it over to you, Lisa. Thank you so much.

LISA FRIZZELL: Excellent.

Thank you.

Can you hear me ok?

CHRIS WAHL: Yes.

LISA FRIZZELL: Great, ok, thank you so much for inviting me to take part in this.

I always love talking about the the program we're implementing and and hearing from other countries as well.

I'm going to start with a little bit of background about my organization and the work we're doing and then I'll talk about the process to select a site for the project that we're implementing and some of the lessons we've learned along the way.

So first, by way of context, the NWMO is a not-for-profit organization and we were established to safely

manage Canada's used nuclear fuel for the long term.

Right now, like in a lot of places, that fuel is stored at licensed above ground facilities.

And while this approach is safe in the short to medium term, it's widely recognized that it's not appropriate over the very long term.

And I would say the need for a permanent storage solution for our used nuclear fuel has really been studied and discussed in Canada for decades.

There's a very long history and in fact just a small history lesson, in the 1980s, our program was leading in the world.

We may even have been ahead of Finland and Sweden.

I'm not sure, my colleagues might might argue with me there.

There was a company called Atomic Energy of Canada Limited that had fully developed the concept for deep geological disposal.

And in 1989, our government actually started an independent environmental assessment commission, which was called the Seaborn Panel.

And that commission worked for nearly 10 years studying every facet of the concept.

And in 1998, the panel concluded that from a technical perspective, safety of deep geological disposal

had been adequately demonstrated, but from a social perspective it had not.

So the concept had been had not been demonstrated to have the broad public support it would need, and it didn't move forward.

And Canada's program at that point was set back decades.

Now, the outcomes of that work led the Canadian government to pass the Nuclear Fuel Waste Act in 2002.

And that law required that the major owners and stewards of used nuclear fuel in Canada establish the NWMO where I work.

So that's how we were born.

And, and I would say the lessons that we learned from that progress or that process in the 80s continue to shape the way we do things today.

So, for example, the plan that we're implementing actually emerged through public dialogue.

The first thing we did when we were formed was spend three years talking to Canadians and Indigenous peoples about how they wanted to see used fuel managed.

And so the plan is really designed to reflect the values and priorities they identified as important.

The plan itself is known as Adaptive Phased Management or APM, and it's made up of both a technical

solution and also a phased and flexible implementation plan.

And both are equally important.

So the technical solution involves developing a deep geological repository to contain and isolate the used nuclear fuel.

And the implementation plan involves phased and adaptive decision making that's supported by public engagement and continuous learning every step of the way through the entire process.

So that gives you a bit of context for how we got here, but I know what you really want to hear about is our site selection process.

So how we're going about actually finding a place to put this repository.

And like the overall plan, the site selection process was designed through extensive public dialogue, this time over two years, and it reflects the ideas and the experience and the best advice that a broad cross section of the public who shared their thoughts came up with on what an open, transparent, fair, an inclusive process for making this decision needed to include.

So the process for selecting a site has always been collaborative and in many ways it's community led.

So for example, since we started the process, we've

been clear that the plan will only proceed in an area with informed and willing hosts, which means people in the area need to understand what it means to host a project like this and support having it located there.

And we've only ever worked in regions where a community voluntarily expressed interest in learning about the project and exploring their potential to host it.

So we launched the site selection process in 2010, and 22 communities raised their hands and said they wanted to be involved in the process.

So it was really extraordinary.

And now today, after gradually narrowing down, in a process that's been guided by increasingly intensive social and technical studies, we're focused on two potential siting areas.

Both are in the province of Ontario.

We're working in in really close cooperation with the municipal and Indigenous communities there and our goal is to select a single site by the end of 2024.

So for a company that thinks in geological time, I will say that's feeling very, very close.

We do have momentum and some of that I will say comes from tangible advances we've made in our technical program.

And that's important because we need to be able to demonstrate to Canadians, especially those living in the siting areas, that the plan is safe and achievable.

And in fact, in 2022, we issued confidence and safety reports for both of the potential sites that make it clear that based on all the technical study completed so far, we have confidence that either site can meet the technical requirements of the project.

And in fact, even before this work, the technical aspects of the concept have been demonstrated and accepted.

First, through the environmental assessment panel that I spoke about a moment ago and more recently through an environmental assessment on a repository for low and intermediate level waste that also did not proceed, but not for technical reasons.

It also didn't have social license.

So what we've come to understand is that while technical demonstrations are absolutely important, siting and ultimately constructing a deep geological repository isn't really a technical issue.

It's an emotional one, and it requires public support, and in particular, support from siting communities.

So our approach to consent-based siting really

means it's up to the communities themselves to decide the best way to define their willingness to host the repository, to decide whether they're ultimately willing to host it, and if so, how they will express that willingness.

And it also means the communities are actively engaged in helping to shape the kind of supportive and resilient partnerships that we're going to need to have in place in order to implement this project together over generations.

So in a way, our approach doesn't prioritize simply looking for a site that's safe from a technical perspective.

We're looking for a safe site that's also safe from a social perspective.

Yeah, and one without the other really isn't suitable.

And there's lots of things we've learned along the way.

I'll mention a couple that I think might be relevant insights for you in the U.S. as well.

One is that the success of Canada's plan can only happen with participation and support of Indigenous peoples.

So for example, we have an ongoing dialogue with

our very active Council of knowledge holders who continuously guide us on the latest thinking about Indigenous knowledge and how we can align it with our work.

By way of example, we regularly host Indigenous knowledge and Western science workshops where we really look to bring those ways of knowing and to dialogue on topics where both world views have knowledge to contribute.

So topics like water, rock, copper and so on.

And we've learned that drawing on knowledge from more than one worldview gives us more data and insights to work with.

So it's something we're proud of because it's the right thing to do, but we've also found it makes the work better.

And we've also embraced a commitment to reconciliation that I'm really proud to say has become embedded in the culture of our organization.

It's it's really part of our DNA.

So as part of our commitment to reconciliation, we released a reconciliation statement in 2018 that acknowledged the historic and ongoing injustices experienced by Indigenous peoples and really set us on the path towards reconciliation.

After that, we created a reconciliation policy and we use that as a foundation to put our words into action.

We've also seen that the success of the plan really requires that we support potential hosting communities and help them build capacity to fully examine the project so they can make an informed choice about their willingness to host it.

Because in our view, it, really a consent-based process needs a foundation of mutual understanding before a decision can be considered in good faith by either party.

So to that end, for years we've worked actively with local leadership, with community liaison committees that were set up to facilitate learning in their area, and with local residents to understand and address their questions as they consider what a project like this might mean for their community.

And one thing that we think has been really critical to the success of our consent-based siting process is what we call the Learn More approach.

So from the very beginning, we didn't ask the communities that expressed interest to definitively support the idea of siting the project in their area.

What we asked was for them to agree to develop a better understanding of the project, so to learn more.

And we signed Learn More agreements with those communities that provided them with the resources they needed to explore their interest in hosting the repository.

And that helped because they knew they weren't being asked to commit before they had a full understanding of the benefits and impacts.

And it gave us the space to work together with them to learn about how the project could fit in each area, not just from a technical perspective, but in a way that could enhance local well-being as the communities themselves defined it.

So now that we've narrowed the list to two and we're getting ready to make our siting decision next year, our engagement in these communities is really focused on explaining the technical aspects of Canada's plan where they have questions and really exploring some of the important socioeconomic impacts associated with the project.

And all of that continues to be shaped by the community.

So for example, our environmental baseline monitoring program was cocreated with communities.

So it's not going to just monitor the things we need to tick boxes for regulators, but also to understand

the environmental features is really important to the people who live in each siting area.

And over the last year, we've completed around 30 studies on topics communities defined as important to them in making these decisions.

So exploring impacts on things like jobs, infrastructure, services and local industries.

And as we've narrowed our focus, we've also built up local teams so we can really be present in the communities in a meaningful way.

And at the same time we're doing all that, of course, we're also at a stage where we're looking ahead because although site selection is the major milestone, that's not the end of our work.

With that, we'll launch into a very rigorous, open and transparent regulatory process that also provides a lot of opportunities for participation and engagement.

So that's the 30,000-foot view.

I will pause there, happy to hand it over to others to speak and and I look forward to hearing any questions any of that might raise for you.

CHRIS WAHL: Thank you, Lisa, that was super informative and we look forward to asking questions here in a moment.

Supervisor Foley, welcome, thank you for joining

us.

We've had the opportunity to introduce our distinguished panelists already as they've gotten started.

We just finished with Lisa.

She was first.

Claes Thegerström is going to go next.

Would you like to say a couple of words about the coalition and your involvement?

SUPERVISOR KATRINA FOLEY: Sure, thank you.

I'm Katrina Foley, I'm the newest Orange County supervisor here, and my district includes District 5, which includes the area I've taken over for Lisa Bartlett, who was the prior supervisor.

So thank you all for being here today, and I'm really pleased to be able to be part of this coalition.

I know that during the last coalition webinar there was presentations from the Department of Energy about their first steps in moving forward with a consent-based siting for federal consolidated interim storage facilities.

And as we embark on this consent-based process, it's helpful to look towards some of our international partners and the best practices that they have.

Thank you, Lisa, for your insights.

And I know that's something that the team here and the coalition is really interested in and the Canadian, Swedish and Finnish programs show that spent fuel solutions are possible and they provide useful lessons for us here in the United States.

So we appreciate your willingness to be able to talk to us and share your best practices and we hope that you'll continue to be a partner with us.

With us today, you know, we have some other partners from Sweden, and Finn, the Finland, and we are really just interested in learning more.

I know my team is just getting up to speed on all of this work that you all have been doing for a while.

And so we are looking forward to being an active member.

So thank you so much and thanks for all the work that you all are doing.

CHRIS WAHL: Thank you Supervisor Foley.

We are very pleased to have you as a part of our team and thank you again for your your support.

Ok, I'm going to turn it over to Claes Thegerström next.

Mr. Thegerström, thank you so much and we look forward to hearing from you as well.

CLAES THEGERSTRÖM: Thank you very much.

It's a pleasure to be able to speak to you.

And I think Jessica will help me with some slides.

So what I will focus on, of course, is on the journey to siting of the Swedish deep local repository for our spent nuclear fuel.

But maybe before that, if I can have the next one, please.

But the nuclear, Sweden, Sweden has been dependent upon nuclear energy for quite some long time.

And since the 1980s we have had about between 40 and 50% of our electricity from nuclear facilities.

Gradually, some reactors have been closed for political reasons or for economical reasons.

And at present we have six operating reactors and they have generated or will generate about 12,000 tons of spent fuel.

We also have since the 1980s deep repository or shallow repository with underground in the bedrock of the low-level waste.

And we have an interim storage facility for the spent nuclear fuel wet storage at when one of our nuclear sites and that's in operation since 1985.

And those facilities have of course been of great value in communication to the public, for instance, to bring them to to the facilities and to show, to show what

what it is all about.

At the time of introducing nuclear, commercial nuclear energy in Sweden, there was a big debate in Sweden about nuclear energy in the mid in the end of 70s and beginning of the 1980s.

And actually we had a referendum to phase out nuclear.

But government decided after the referendum to stick to the 12 reactors.

But there was a law created, several laws that has formed all the way up to now the basis for the responsibilities and the procedure to find a site and a method for deep geological disposal in Sweden.

So this is the concept called KBS-3 concept developed in Sweden, adopted by some other countries, maybe with modifications.

Finland, it's has been using or is using similar, similar concept, if I may have in the next one please.

And very important for also for our siting work has been that we have had large scale laboratories, research laboratories and also demonstration laboratories for the underground Äspö Hard Rock Laboratory for the canisters, both these facilities and the Bentonite laboratory in the Oskarshamn.

So I just wanted to remind that technical side of

the problem, it's important of course both for the future licensing you will see that and for the acceptance and communication possibilities.

The next slide will will show in some detail the very long process of siting the Swedish geological repository.

We actually have two parts of the siting.

I would say we had a first part which was not very goal-oriented, but was more a study process of the deep characteristics of Swedish bedrock.

We are basically having just crystalline bedrock and so we we don't have the choice between very different formations.

We made a set of of drillings to get better data and we also made overview studies and I will come back to the conclusions of those.

But it was only in the beginning of the 1990s that detailed process for the siting was laid down on proposal by SKB and accepted by the authorities and by by the government.

So the real siting process started in 1992 I would say and it ended up 2009 when we made the final choice for a site in Östhammar after both feasibility studies and site investigations.

And next, please, in the early phase there was a

lot of protests and and demonstration and discussion.

So actually that phase was done in a context with high, high debate about nuclear.

And also we're not having the option of of really involvement of stakeholders.

It was more like a top down process, which actually made the it necessary to have a time out of for the studies of of finding a site, but it gave a very good basis for understanding the Swedish bedrock.

May I have the next one, please?

So some of the early conclusions from the drillings, it's yes, if you press one, one and another one.

So yes, that's fine.

There were two basic conclusions presented.

First, that crystalline bedrock could be suitable for repository and most probably we could found suitable sites in many parts of the country, not everywhere, but in many parts.

And then a conclusion that local acceptance is really necessary to get through and the process we concluded must therefore be based on voluntary participation.

Based on that, next slide, please, we started the phase of feasibility studies, which were studies made in

conjunction and cooperation with local municipalities on a voluntary basis.

And we actually came up to eight feasibility studies.

The two ones in the north was made in a very a difficult social debate situation and actually after the first phase these municipalities left the process after having local referenda asking if SKB should be allowed to continue with the next phase and the answer was no.

All the other feasibility studies were made in municipalities where there were already nuclear installations or nuclear reactors or municipalities in neighboring new municipalities to such municipalities.

Next slide please.

After evaluation of of the feasibility studies, we ended up in site investigations, particular studies at two different sites, one in Laxemar at the nuclear area in Oskarshamn and one in Forsmark at the nuclear area and nuclear utility area in Östhammar.

And these site investigations went on from 2002 until 2009 when we were ready to evaluate the result of the site investigations and to make a choice, and next slide please.

This choice was quite easy to make actually, because we had local opinion was very favourable in both

these areas.

But the the bedrock characteristics at Forsmark made it significantly easier to construct and to operate and to show compliance with safety criteria than in Oskarshamn.

That's not to say that the site in Oskarshamn would not have been a possible site, but it would have been more costly and more complex to make a safe sufficient, sufficiently safe repository at that site.

So we announced our site selection.

This was a choice solely by SKB.

And actually this is a picture of myself in the middle, but the two mayors of the two of the two municipalities.

And only at this occasion could we reveal to the mayors which site had been chosen.

But as it came out, we needed to make the encapsulation plant in Oskarshamn and the repository in Fosmark.

That was our choice.

So they were both reasonably happy, even if the mayor of Östhammar was, maybe it came out the best way.

And next please, just to illustrate actually that this it was not a choice that created, you know, debate, negative debate.

It was both municipalities very happy and, and actually expressed that very clearly in local media and so on.

So it was kind of a competition to to get these facilities.

If we take the next one, you can see some of the opposite of the opinion all figures and you can see that there was a gradual increase of positive opinion during the site investigation phase and that has continued.

I think it's now a little bit over 80% in at the site and the area where we will have the repository.

That is of course a very strong factor for the siting.

So what is behind this result if I may have the next one?

Well, it's, it's, it's really a set of of, of communication and involvement of stakeholders in in many different ways.

Strong local presence, local meetings, both bigger meetings, but many small meetings with key stakeholders, with neighbors and so on.

And if I may have the next one, just to illustrate, we used our ship for transportation as an exhibition ship during summers.

So this is one example there on on just during

three days in a neighboring village to the site.

There were 4000 visitors coming to the ship to to see what we are doing and to meet people from SKB.

And another example we offered in in in Östhammar, every citizen to come with a bus for two day tour to go to the existing facilities in in Oskarshamn and to go and see the spent nuclear fuel for instance in mainframe storage facility underground at Oskarshamn.

So communication and stakeholder involvement was really a core activity of of the company and not only involving communication department, but all part of the company was involved in that.

Finally the licensing process in 2011, that is two years after site selection, we have put together all the documentation.

So we, we presented our license application for the deep repository and for the encapsulation plant.

So final repository in Fosmark and encapsulation plant in Oskarshamn, they they go together, these two licensing.

Licensing system is relatively complex in Sweden because that two major laws involved, Nuclear Activities Act and Environmental Code and and on on top of that, they even in interact between each other.

So that it was a long and and struggling process to

to get everything together and to answer all questions.

A lot of stakeholders used to the process of open, open hearings to put additional questions.

So not until 2018, after seven years, there was a clear response by the radiation protections, the Safety Authority and the Environmental Court and and what what was then missing was the decision by the government.

At that time the government had a minister of energy, anti-nuclear from an anti-nuclear party.

But that changed in 2021 and finally in 2021, SKB got the the green light from all instances that that were needed to get that.

So that was the story.

Now the planning is going on.

I've left SKB since many years, but I was I was operating as the CEO of the company until 2012.

So I had the pleasure to provide the license application and also to follow the licensing procedure until a few years ago.

To finish just a a few conclusions if I'm not taking too much time.

I think key issues that have helped this process is the clear responsibility that there was long term financing procedures and a long term plan with review of that plan.

RD&D facilities with international corporation not least with Finland because we as I said they adopted the KBS program and and we we interacted a lot with the Finnish program which was very, very useful, I think for both of us.

Communication a key activity and of course, one has to recognize finally we ended up in municipalities where the positive extent of long-term experience of nuclear facilities to nuclear reactors.

I, I've been asked to say a few words about France and and the U.K., but I think maybe I I should do that later if there is time.

I'm involved a little bit in those two countries at the moment.

CHRIS WAHL: We'll make sure that that you have a chance to do that.

Claes, thank you very much.

Super informative and congratulations for all the accomplishments that that's seemingly a lifetime's work.

So well, well, well done.

CLAES THEGERSTRÖM: Thank you.

CHRIS WAHL: Ok, I'm going to turn it over now to Mika Pohjonen to talk a little bit about what's going on in Finland.

Oh, Mika, I think you're on mute still, Sir.

Can anyone hear Mika?

I cannot.

No, we cannot hear you, Sir, still, I'm sorry.

I don't know if the mute is, Jess, is that possibly on our end or?

I don't think we've done anything like that, right?

JESSICA LUTERNAUER: I don't believe so, but I'll double check.

CHRIS WAHL: Thank you.

Appears to still be on.

The picture is certainly engaging.

I can't wait to hear more, but I think the mute is still on.

Claes do you want to talk a little bit about France as we sort through this technology?

CLAES THEGERSTRÖM: Yeah, yes.

I, I, I could do that.

CHRIS WAHL: Ok.

CLAES THEGERSTRÖM: Ok, so, so for France, I, I followed for a long time as a member of the National Commission to review the program.

I left the Commission a few years ago, but I still know what's happening.

But I was at the Commission for, I think, more than 20 years.

Just a few words.

I think some differences with maybe other countries in, in France, there was also a first phase of finding I think four sites and trying to get to the sites to do investigations and drillings, but failing to do so.

And actually that was by the end of the 1980s, beginning of 1990's, the government had to intervene and to stop that siting program.

Instead the issue of of nuclear waste disposal and storage very much came over to the parliament.

And there was a law defined by the parliament, it's named after a member of the parliament.

It's called Loi Bataille in 1991, which said that for 15 years in France that would be actually would not be allowed to dispose of high-level waste.

But it should be an extensive R&D program on three options, deep geological repository, long-term interim storage or long-term storage on surface on the surface and transportation of the of the elements.

And that program went on for the 15 years including then for the deep logical repository studies at three different sites with drillings and estimations.

And it ended up with a with a choice of the sites in Eastern France, in Meuse/Haute-Marne site normally called Bure, where at first it was decided to build an

underground research laboratories to study that formation, which is a clay formation, which quite different formation than from what we have in Finland and Sweden.

And in 2006, that is when the 15 years of the first law had had passed, the Parliament had a new debate and, and there was also public debate.

And the decision by the parliament was at that time that the deep logical repository was the option to pursue.

There was one additional requirement that, and that was that they, they, they focused a lot on that at at least at the beginning, the disposal must be reversible.

They didn't define what they meant by reversible, but reversibility was a major issue in the French debate, which was quite different from what we had in Sweden, for instance, and, and many other countries.

It's really the country where reversibility has been on top of the discussion.

A few years later there was a decision to start the, let's say the the more industrial focused part and development of the program.

And it was decided that the the site or the area of interest was the area around Bure with the clay formation and where there was this underground laboratory.

It was also said that the underground laboratory should not be transformed to a repository, but the repository could be adjacent, but they're not together with the underground laboratory.

And then there has been a detailed program to define where could they put the surface facilities, where can they put the underground facilities, more and more detail about the the design of the program.

It's also to mention that that first planned facility, the Cigéo as it's called now, it's not only for high-level waste, it's also for medium and long-lived waste.

So it's, it's a bigger facility for instance than what we are planning in Sweden and what what Finland is, is planning or, or we build.

So that now they they've defined by decision once again by government and and the Parliament that Cigéo should be built.

The application has been I think recently given and licensing will go on until at least 2027.

And then one other particular part of this is that it will, once it's been constructed, that will be a pilot part of the repository.

And it will be a period, I think of 10 years of pilot operation of the disposal facility until there is a

review of the experiences of that.

And then plan is of course, to want to regular operation.

CHRIS WAHL: Claes, I, I'm going to interrupt you.

I, I believe if that's OK.

I believe that Mika is now on.

CLAES THEGERSTRÖM: Absolutely.

CHRIS WAHL: Pardon me.

So I want to make sure that we give him a chance to, to present and then still have questions.

Is that ok, Claes, if we allow him to?

CLAES THEGERSTRÖM: Yeah, yes.

CHRIS WAHL: Fabulous.

So Mika, are you able to yeah, I'm sorry.

I'm so sorry.

I our, our technical team is saying perhaps if you log off and log back in and connect with audio as it says there on that first button can join with computer audio.

Maybe if you could try that and we'll be patient and see if that works.

I apologize for any kind of technology snafu.

So give me a thumbs up.

Is that your plan to log off and log back in?

Ok, great.

So in the meantime, just real quick one question

Lisa for you that we do have that the panelists was interested in was that what are some unexpected challenges you encountered or you have encountered to date and and how did you overcome them in your efforts in Canada?

LISA FRIZZELL: Oh, that's a big question.

I think, I think as with, I'm not sure I'd say unexpected challenges, I think we've gotten a lot of insights from working with communities and really taking our cues from them.

So, you know, our engagement program, the studies we've done, the information that we've shared has, you know, really been shaped so much by communities themselves.

So there are certainly things that we've done in a different order than we would have anticipated.

There are things where we needed to provide more information because it it turned out to be a a significant area of interest for the community.

I would say it's been very rewarding to kind of work towards the concept of partnership with communities.

And you know, that really requires that we be adaptive and, and change based on what communities are telling us and, and what's happening in the world around us.

So to give you just a couple of tangible examples, I think originally when we launched the site selection process, we thought that once we selected a site, we would probably need to share a lot of information about transportation, how we would move the used fuel to the site.

And what we heard very early in the process was that was actually an area of pretty big interest for communities.

And so we brought the engagement on that topic forward significantly.

And we've done a lot of work as a result to engage, to answer questions and even to develop draft planning frameworks to kind of test that we are really considering all the things that are important to Canadians and thinking about this kind of plan.

And the other thing that's happening very much as we speak is there's a lot of discussion now with climate change about new nuclear and small modular reactors and other types of fuel.

So that's something that sparked a lot of opportunity for discussion about kind of the long-term plan and and how we may need to adjust for different volumes and types of used nuclear fuels.

So that's something we're engaged in very

significantly right now as we speak.

And I'm sure there will be other things over time that that also change.

I think one of the things we really recognized and one of the reasons we call it adaptive phase management is we're implementing this project over generations.

So it's inevitable that things will change.

And we've built into the process the ability to be flexible and adapt to new science, new Indigenous knowledge, and changing societal expectations.

CHRIS WAHL: Thank you.

That's that's that's great.

Great answer.

Supervisor Foley, I see that you have your hand raised.

You'd like to say something.

Sorry, I think you're on mute.

KATRINA FOLEY: I had a couple questions for Claes and Lisa and newly engaged in this issue.

So I mean, if you had to say, what is the number one issue with regards to the transportation concerns?

What was that in the communities where you were traveling through?

LISA FRIZZELL: So I can maybe jump in and Claes, certainly feel free to add your perspective.

I mean, I think with a lot of as with a lot of discussion about anything, nuclear, safety often comes to the the top of the list.

People rightly want to understand, you know, if there's a risk, how are we ensuring that this is safe?

What's the track record here?

And, you know, what steps will be taken to ensure that workers and the public and people driving on the highways or riding the rails or living in communities that are being traveled through are not at risk.

So I would say that's, that's one of the big areas where we spend a lot of time discussing, you know, things like, you know, the fact that there is a, a very robust safety record for transportation around the world.

There's never been over 50 or 60 years of doing this, an incident that's caused harm as a result of of radiation.

There's certainly have been conventional accidents, but the robustness, the strength of the containers and the oversight and the processes to ensure safety have always ensured that even in that case, people are safe.

And, and also understanding things like the, the traffic, how it will be transported and what, what measures are in place to, to make sure the infrastructure is, is sound where we're transporting that as well.

Those are a few of the main topics.

CHRIS WAHL: Thank you Lisa, thank you very much.

Mika, can we see if, can you, can you try again and see?

Yeah, so just still not working.

We're going to send you a dial in number now so that maybe you could do a dial in with a telephone, but we can still see your slideshow.

And, and we're terribly sorry for this technology snafu.

In the meantime, because I know we have that'll take a second and that's being sent to you right now as we speak, Mika.

There was did you want to comment too as well, Claes, on on the supervisor's question or, or one of them?

CLAES THEGERSTRÖM: Yes, very quickly about transportation.

In our case actually we ended up with you know these facilities on the coast and the transportation could be solely by by the ship that has been used already since mid of 1980.

So, so there was very little discussion about transportation of of the spent nuclear fuel.

It was kind of continuing with, with the operations

that had already been been in line for many long time.

There was some discussion, on the contrary, on, you know, land transportation for the construction of the facilities, where will the excavated rock be taken?

How many lorries will come and pass my, my house and things like that, that we, we've had to deal with and, and try to answer all the questions.

KATRINA FOLEY: So in terms of the communities, the, the newspaper article that showed that the deputy mayor was, you know, crying at the excitement of having the siting.

Help us understand, like why so excited?

Because of the funding that's going to come into their community, or what's the reason?

CLAES THEGERSTRÖM: Partly, of course, that the it was seen as as mean very good investment and bringing bringing welfare to the to the local community.

But I also think that was a big part of, let's say it might sound special, but actually about pride to be part of a, of a big and exciting project, which is a national need.

But the solution is local.

And this lady had been working with this project as a member of the community partnership for maybe 20 years.

So she and many others were very engaged in in

being part of this.

And they were proud of their municipality that they had, they had put a lot of critical questions.

They had pushed SKB to, to, to make a good job.

And, and I think that's why, if I may interpret what was behind that was also an important part of it.

KATRINA FOLEY: Well, that's great insight.

Thank you for sharing that.

CHRIS WAHL: Thank you supervisor for the question.

Ok, Jess, do we have any update on on Mika and and his ability to communicate with us now?

JESSICA LUTERNAUER: I'm not sure he, Mika, do you want to try unmuting?

We're hoping he can use a dial in.

CHRIS WAHL: Yeah.

Supervisor Desmond, you have a question or comment.

JIM DESMOND: Thank you very much.

This has been very, very interesting perspectives and and to hear some success stories.

Claes, you'd mentioned a couple of shallower repositories for less reactive material and did those also get placed near current nuclear facilities or were they what, what was any differences that you learned through that process of the, the shallower repository sites?

CLAES THEGERSTRÖM: The, the, the shallow repository is actually also at the Forsmark site, but it was, it was sited already in the very beginning of the 1980s and it was put in operation 1988.

It was the the, at that time the decision process did to a less degree involved the general public or opposition groups and so on.

So it was a what was at that time a classical decision by the operator, SKB, the the majority of the local community council and with the support of the government.

And there were some opposition, some groups of people protesting during the process, but not, not very much.

But it was a good experience.

And and it was also, as I said, one of those facilities where we could bring people go down in the tunnels and and see a facility that is underground, even if it was just, you know, at the depth of 50 to 100 meter and not 500, 600 meters.

JIM DESMOND: And then I guess for Lisa has Canada, I I know you're in the in the process right now, but his do you have shallow repositories now or any I, I I missed that if you had any repositories at this point in time?

LISA FRIZZELL: Yeah.

So right now for all of the used fuel is stored at licensed facilities by the reactor sites In interim storage.

So that's that's really where it's all stored today.

There are, there is a project underway that involves and I'm I'm not kind of in a position to get into a lot of the details.

I think it's primarily for low level waste by another organization right now and that's going through a regulatory process.

But for the used fuel, it's all like I say safely stored at interim storage until the repository is ready for operation.

And at that point, we'll start moving it into the repository.

There's no interim step between those two things.

JIM DESMOND: All right, thank you.

CHRIS WAHL: Thank you, Supervisor.

KATRINA FOLEY: Yes, we do have a question that I actually think is a good question too.

Can we ask the question now since we're sort of waiting?

CHRIS WAHL: Yeah, sure.

Of course.

Is this the question from Dwight Warden that you were referring to?

KATRINA FOLEY: Yeah, I think that's a good question.

CRHIS WAHL: Great minds think alike.

I was just about to ask that.

So do you want to do you want to ask that?

It would seem to me that that would be more apropos for Claes, given he's a little for they were a little further along.

But but go ahead please.

KATRINA FOLEY: If a community says yes to being a site, what kind of ongoing support can they expect if things go wrong?

That's the question.

CLAES THEGERSTRÖM: It may be difficult question because it it depends of course, a lot what what what goes wrong and what, why and all that.

But in general terms, I mean the responsibility is with the operator and and of course of the constructor in each case, SKB would be the constructor of the facilities.

And then to operate them, which I mean, operation is for several decades and then closure probably by the end of the century.

And, and everything that happens during that time.

Basically, if I simplify a little bit, should not be the responsibility of the of the municipality or should not, they should not have to, to spend their effort to, to clear out that, that clearly the operator and the authorities and the national government if, if it's a big thing.

So they've been very pertinent to to, you know, in in their agreement, they I mean, they had a veto right before government could make the final decision that it will be at Forsmark and and the green light to start constructing which which will happen in a few years.

The municipalities have written a list of requirements that they have that they can follow the program very closely and related to your question, that they are not the ones responsible and in particular not responsible of the closure, of the closure.

It's with the state, with the government.

CHRIS WAHL: Thank you, Claes.

Yeah, I think we've got Mika live.

So again, I apologize now.

So we are at the conclusion of our time period, but what I'm going to do is for those folks that are able to and willing to stay, stay on, I'd like to give Mika a chance to present.

So Jess, maybe we could pull up the slides so he can see it, so we can see those while he's speaking.

And you can ask us to advance the slides as you go along, Mika, if you can't see them.

But then again, I want to thank everybody for participating if you do have to leave.

I know both the supervisors have very busy schedules and we appreciate their time.

So we completely understand if if they're not able to stay on.

But you're certainly welcome if you can.

So for everyone that can stay on a little bit longer, I'm going to turn it over to Mika.

Thank you.

MIKA POHJONEN: Ok thank you.

Can you hear me now?

CHRIS WAHL: Yes, Sir.

MIKA POHJONEN: Yeah.

Very good.

So I will use only 10 minutes of your time.

Sorry for this technical hassle.

I don't really know where it where it came from.

I was booting and entering and reentering and so on.

But now we are here.

Posiva Oy is a private company which is which is which is responsible for final disposal of its owners, two private companies, Teollisuuden Voima Plc, operating all nuclear power plants and Fortum Plc, which is publicly listed company.

We have 90 employees.

We buy approximately 100 person years per year, external, external, expert level staff expertise, and then we have 150 construction workers since on our side from contractors since 12 2019 when we started the intensive phase of the construction.

So turnover is 116 million per per year which is of course cost for our owner subsidiary possible solution sales to expertise of the final disposal.

I represent that company and I we we are having having projects for in some 15 countries at the moment to advise our our clients based on our experience.

So next slide please.

So this is our home island in Southwestern Finland.

We have three power units there, two times 900 megawatts and one one 1600 megawatts in the newest, Olkiluoto three.

Next to the power plants to the left we have interim storage for spent fuel and then in the upper right corner we do have underground repository for low

and intermediate waste that has been operative since 1992.

If we jump to the foreground, this is the Onkalo area which is our our area.

Now the bit older picture you see, you see in the in the middle you see a construction site of the encapsulation plant for spent fuel and then then couple of other buildings.

They are hosting building and and ventilation building.

We, if I very shortly, look back at history, we selected our site.

You can still keep the previous slide please.

So we selected our site in in 1999.

We got the first, first permit, which is the most important decision in principle in 2001.

So I don't go back to those site selection histories in 90s, 80s and 90s.

Then we submitted our application for construction license after constructing Onkalo, which is our research facility, but will be part of the final disposal facility.

So it's not a separate laboratory.

After constructing that and developing, developing our concept for 10 years, we submitted a license for

construction permit in 2012.

We got the permit in 2015 and since then we have been constructing our final disposal facility.

We also have been preparing our operation license application which we submitted in the end of 2021.

You can go the next slide or in fact you can skip the next slide because the KBS concept was was already shown, shown in SKB presentation.

So this is how our encapsulation plant looked last May when it was ready.

Now all the fencing and and installation of of main equipment has been finished and it will go to main main tests starting starting next week.

So, this is a year-old picture, but this is how it looks, looks like.

Then you can take the next slide.

Please see that in the upper left corner you see a final disposal hole and above that, the drilling machine for those holes.

And you see you can come down to the left side, there's a final disposal tunnel, some ventilation equipment or ventilation channels.

Then you see the see the canister installation machine in the lowest picture in the in the left side and the canister receiving station in the main main picture

and and the cross-section of Olkiluoto you see you see on the lower right corner.

We have now finished excavations last summer a year ago.

So everything is is now excavated and we will continue after five, six years when we get the first five tunnels full and backfilled.

You can take the next slide please.

As I mentioned we submitted operating licence application, it's 17,000 pages of e-documents, interrelated e-documents.

So as whereas we submitted our construction licence application using a van and hundreds of folders.

Now this was just giving the password.

So of course we have printed out some summary reports, but this is an e-document and we estimate it's of course not in our hands, but we estimate based on our experience and, and and discussions with our authorities, also others from our nuclear radiation authority that the handling would maybe take three years and we could get the permit by the end of 24.

And after getting the permits, we are then ready for, ready for operation and we plan to start final disposal in, in some, somewhere in 25, maybe mid-25.

I think that was my last slide.

Thank you for your patience.

CHRIS WAHL: Thank you, Sir.

We really appreciate your thank you for your patience.

I'm sorry that we had such a difficulty in technology.

So I, I think I'm going to wrap it up at this point.

We had a few more questions, but what I would recommend and suggest is if anybody has subsequent questions, they could send them to our website or to Jessica or me or any anybody affiliated with the coalition.

We have, today's webinar will be posted on our website, spentfuelsolutions.com where you can also sign up to receive notifications about future events and other important updates and in the progress that we're making.

I'd like to thank our supervisors, Supervisors Desmond and Foley for joining us again, thank you very much, really appreciate your support.

And thank all of our panelists, Lisa and Claes and Mika, thank you so much for your expert commentary and and feedback.

I see Supervisor Foley, would you like to make a closing remark or two?

KATRINA FOLEY: Sure.

And I just hope that we can post it on our social media also so we can all share.

Just really learning a lot here.

Thank our speakers for joining us here and helping to educate us about your successes.

So we really appreciate it.

CHRIS WAHL: Thank you.

And Supervisor Desmond, would you like to make a closing remark or two?

Nope, all good.

Ok, great.

Thank you, everybody for your time, patience, fascinating topics and great information.

It gives us hope that we can accomplish the same in the United States here.

So thank you very much, everybody.

Have a wonderful Thursday and we'll talk to you next time.

Bye now.

CLAES THEGERSTRÖM: Thank you.

Thank you.