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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

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EXTENDED STORAGE AND WASTE CONFIDENCE WEBINAR

+ + + + +

WEDNESDAY,

DECEMBER 14, 2011

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The webinar was convened at 2:00 p.m.,
Lisa Janairo, The Council of State Governments,
Midwestern Office, presiding.

PRESENT:

LISA JANAIRO, The Council of State Governments,
Midwestern Office

CHRISTIAN JACOBS, NRC, Office of Nuclear Material
Safety and Safeguards

CHRISTINE PINEDA, NRC, Office of Nuclear Material
Safety and Safeguards

JAMES RUBENSTONE, NRC, Office of Nuclear Material
Safety and Safeguards

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

(2:00 p.m.)

MS. JANAIRO: And the recording will be available on the NRC's public meetings page later this month. GoToWebinar will also have the recording archived on its website, and you will all receive the link to that recording and a followup message that will go out this week.

Second, to reduce the possibility of feedback or other external noise, all lines are in listen-only mode right now, and they will stay that way during the presentations.

The speaker will answer questions after all the presentations are complete. We will take questions in the order received. You have two options for asking questions. You can submit them using the GoToWebinar questions panel, or you can raise your hand and we will unmute your line.

Please identify yourself when you ask your questions. If you accidentally click on the button to raise your hand, just click it again and it will turn off. If you do ask a question or make a public comment, please refrain from using a speakerphone to help ensure high audio quality.

And, finally, after the webinar, a brief

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1 survey will pop up. Please take the time to fill out
2 the survey, so that we can get feedback to help the
3 NRC improve future webinars.

4 I will turn the floor over now to Chris
5 Jacobs of the NRC to explain the purpose of today's
6 webinar and to introduce our speaker.

7 MR. JACOBS: All right. Thank you, Lisa.
8 Welcome everyone again, and also those who are just
9 joining us today. My name is Christian Jacobs. I am
10 the project manager for the NRC on extended storage
11 and transportation.

12 One quick reminder -- please let us know
13 now, or at any time during the presentations, if you
14 are having difficulty hearing us. You can do this by
15 raising a hand or sending us a chat message.

16 Similar to yesterday's webinar, we have
17 set aside time in the agenda for Q&As after the
18 presentations have been completed.

19 First, I want to once again thank Lisa
20 Janairo from The Council of State Governments,
21 Midwestern Office, for all of her assistance in
22 helping the NRC set up these webinars. I also want to
23 thank again those members from state governments and
24 from the public who are participating in this webinar
25 with us today.

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1 The purpose of these two webinar sessions
2 -- yesterday and today -- is to inform all of you
3 about the NRC's plans/activities on technical and
4 regulatory issues related to extended storage and
5 transportation, or EST, of spent nuclear fuel and on
6 plans to develop a draft environmental impact
7 statement for an update of the NRC's waste confidence
8 decision and rule.

9 We had three recent public meetings in
10 September and October regarding these two subjects --
11 EST and waste confidence. Today's session provides us
12 another opportunity to share this information with
13 those of you who were unable to participate in the
14 previous meetings.

15 Yesterday we primarily focused on the
16 waste confidence activities, but today we will
17 concentrate more on the EST activities. And one
18 followup from yesterday, there was a question about
19 notes from the meeting. We don't provide notes of
20 these meetings, but we do provide a meeting summary.
21 And that will be posted on our website within 30 days
22 from the date of this webinar. We most likely will
23 have it out in the next couple weeks.

24 Now, I would like to introduce Dr. James
25 Rubenstone, who is a branch chief in the Office of

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1 Nuclear Material Safety and Safeguards. Jim will be
2 your speaker and presenter today. I will turn the mic
3 over to Jim.

4 DR. RUBENSTONE: Thank you, Chris. And
5 thank you to Lisa and to The Council on State
6 Governments for allowing NRC to use this media forum
7 -- webinar -- to reach a greater share of the public
8 to talk about our plans for extended storage and
9 transportation, and, as we discussed yesterday, work
10 towards a possible update of the waste confidence rule
11 and decision.

12 As Chris noted, we have had some public
13 meetings before, and this is a followup. The same
14 material that we presented at those meetings is what
15 we are using here.

16 I will begin with the same slides that I
17 used yesterday, and I apologize for those who are
18 hearing them a second time. But I wanted to make sure
19 that everyone got the same story on both days.

20 To start with, I will talk a little bit
21 about general plans to -- by NRC to ensure the
22 continued, safe, and secure storage and transportation
23 of spent nuclear fuel.

24 We are in a state now where there are
25 uncertainties in the national policy, and some things

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1 do remain constant. The Federal Government still has
2 the ultimate responsibility for commercial spent
3 nuclear fuel used to make electricity. And as the
4 national policy goes through this period of change
5 until a clear path emerges, the extended storage of
6 used or spent fuel is probably going to be in our
7 future.

8 NRC's mission, as it says here, remains
9 the same -- protection of public health and safety and
10 promoting common defense and security and protecting
11 the environment. As NRC moves into this new phase, we
12 are trying to take a systems level approach to
13 everything that happens in the back end of the fuel
14 cycle -- the back end being the state of the fuel once
15 it leaves the power reactors.

16 We want to make sure that we can continue
17 to ensure safety as the policy evolves, as I said, and
18 we will provide any information we can to the actual
19 decisionmakers, which include our own Commission as
20 well as other parts of the government.

21 We are trying to do this in an integrated
22 fashion. We are working to look at all of the aspects
23 of the back end of the fuel cycle, which includes
24 onsite storage, possible storage at other sites,
25 potentially reprocessing if that becomes part of the

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1 U.S. national policy, and then ultimately geologic
2 disposal of the fuel. Geologic disposal is still seen
3 as the ultimate end.

4 We are trying to work together with all
5 parties who are interested in this. In the U.S., that
6 includes primarily our NRC licensees, the utilities
7 that have produced the fuel and own it now, the
8 vendors of the storage systems, as well as other
9 interested local and national public interest groups,
10 members of the public, and of course state government.

11 Internationally, we are working with our
12 colleagues in other countries who are facing similar
13 issues with extended storage and other forms of dry
14 storage. Some of those are already -- been doing it
15 for some time and have some experience. Other
16 countries are about to embark on this and are -- we
17 are helping them along the way, and we are learning
18 together.

19 We want to engage the stakeholders as
20 often as possible to make sure all issues are
21 considered. How can we involve stakeholders? We are
22 actively seeking input and feedback, and this webinar
23 is one of the tools we are using now and hope to be
24 using more in the future.

25 We want to encourage interested parties to

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1 stay involved as these things proceed. We are
2 basically in the early stages, which I will talk about
3 in a minute, of putting our plans together. So we
4 want to get the plans out there, so people can see
5 what NRC is planning and give us some useful input.
6 And I think this is -- this webinar is one of our new
7 web-based tools that we will be using more in the
8 future.

9 We also are setting up -- and these should
10 be available very shortly -- an email address for the
11 extended storage program and an email address for the
12 waste confidence program, which we will use to reach
13 out to people to let them know, as our work proceeds
14 and what reports of meetings are coming up, and to
15 seek input and even specific comments on certain
16 reports as we develop.

17 So that's the introduction, and we can
18 move to the overview. This part gets a little more
19 specific about the two projects we have going now --
20 the update to the waste confidence decision and our
21 work on the technical issues related to extended
22 storage and transportation, which is the main focus of
23 today's webinar.

24 These are complementary initiatives. They
25 are going in parallel, and we are trying to use

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1 information from each side to inform the other.
2 Starting with waste confidence, which was discussed in
3 some detail yesterday, this is a generic determination
4 that NRC issues in order to provide a basis for
5 continuing licensing of nuclear powerplants and
6 basically sets aside the question of disposal and
7 ultimate path of the waste from the individual reviews
8 of the license renewals.

9 The waste confidence decision is not
10 specific to any given site. It is not for a specific
11 licensing review or licensing decision. It was most
12 recently updated about one year ago, in December of
13 2010, where the Commission stated that they have
14 confidence that the waste can be safely and securely
15 stored for 60 years beyond the life -- the licensed
16 life of a facility.

17 At the same time they issued that
18 decision, that directed the staff to prepare a long-
19 term update for life beyond 60 years plus the life of
20 the facility, and at the same time prepare an
21 environmental impact statement to look at what
22 potential impacts would come about from that extended
23 storage period.

24 So the EIS that we talked about yesterday,
25 the waste confidence decision, and a possible change

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1 to the rule is what we are rolling up as our waste
2 confidence project.

3 In conjunction with that, we are looking
4 at technical issues related to extended storage and
5 transportation. And these involve a number of areas,
6 which I will talk about in a little more detail in the
7 next set of slides.

8 Our goal there is to fully understand the
9 potential impacts of extended storage in terms of
10 material degradation and other things that may impact
11 the safety functions of the storage system, so that we
12 can ensure that storage continues in a safe and secure
13 manner, and that any transportation that is related
14 can also be done in a safe and secure manner.

15 By definition, storage is an interim
16 solution. Any place where things are being stored
17 they will need to be transported from that, at least
18 one time and maybe multiple times if there are
19 consolidated storage facilities, before things reach
20 their ultimate end in a disposal repository, or in
21 some reprocessing.

22 And the activities we are doing under the
23 extended storage and transportation program begin with
24 technical investigations, but they are directed to
25 possible changes in our regulations and the guidance

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1 we provide. And of course we want to engage
2 stakeholders on both these initiatives.

3 Here are some of the commonalities. Both
4 the waste confidence and the extended storage program
5 focus on commercial spent nuclear fuel, and they both
6 focus on dry storage over long periods. Fuel, when it
7 comes out of the reactors, is stored wet in spent fuel
8 pools for some period of time until it has
9 sufficiently cooled down to be able to be moved into a
10 dry storage system.

11 Both the waste confidence and the EST
12 programs deal with the same type of systems, the same
13 type of physical processes and effects that can happen
14 within them, so essentially the same types of
15 technical information.

16 Where they diverge is in the actual use
17 that we put these -- this information to. Under the
18 waste confidence, we are focusing on environmental
19 impacts as broadly defined in the terms of the
20 National Environmental Policy Act.

21 These are impacts to the various
22 components of the environment -- land use, air
23 quality, potential radiation doses to the public, to
24 workers, and transportation-related issues. It is a
25 broad scope, it is defined well under NEPA, and we

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1 will do that in a general fashion by using
2 representative analyses.

3 And Christine talked about -- Christine
4 Pineda, one of my colleagues, talked about this in
5 some detail yesterday on the webinar, about how we
6 were intending to approach this.

7 We are developing now a report which lays
8 out some of the assumptions and scenarios that we
9 expect to use as we move into developing an
10 environmental impact statement and the formal NEPA
11 process for that. This report should be issued for
12 public comment some time within the next two weeks to
13 a month, and we will certainly alert everyone who is
14 on this webcast by our new email system that we are
15 now into public comments and we are actively seeking
16 your comments on this report.

17 The extended storage and transportation
18 initiative focuses on the technical basis that we are
19 going to use in any future licensing actions, and with
20 a clear focus on the performance of various components
21 to do their safety functions. And it will support our
22 current regulations, any changes in regulations,
23 guidance, and future reviews of applications as we
24 move into longer-term periods of storage.

25 I think most people are familiar with dry

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1 cask storage systems. This is one example of a
2 canister-based system. There are also systems in use
3 that have a more integrated overpack and canister
4 together. The main goal of these is to provide a
5 place for spent fuel to be stored dry in an inert
6 atmosphere away from the pools.

7 There is currently about 1,500 loaded
8 casks in the U.S. system, and there are independent
9 spent fuel storage installations in I think 33 states
10 at this point.

11 Almost all of these are at existing
12 powerplant sites, including some decommissioned sites
13 where the reactors have now been shut down and in many
14 places disassembled.

15 As it shows here, there is basically two
16 general designs, either a vertical or a horizontal
17 layout, as you can see in the two right-hand
18 photographs, the upper one being the vertical where
19 there is a canister with a concrete overpack placed on
20 top of it, and the bottom photo shows a horizontal
21 where the canister is slid into this large concrete
22 structure.

23 Now, as I said, there is a number of
24 different designs used from primarily three vendors in
25 the U.S.

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1 Opportunities for engagement -- this
2 project will be going on for several years and several
3 phases, and I will talk about the phases in the EST in
4 a minute. Our efforts right now are to define the
5 tasks and develop our plans and schedules, and we are
6 reaching sort of the end of our initial planning
7 stage. Things are coming together, and I will talk
8 about the EST plans. Christine spoke of the waste
9 confidence plans yesterday.

10 We have draft reports coming out in each.

11 I mentioned the waste confidence report. We have a
12 similar report that focuses on the extended storage
13 technical areas and where we feel are the highest
14 priority areas for future technical work, and with
15 some relative prioritization about how NRC views each
16 of those areas.

17 That report is lagging a bit behind the
18 waste confidence report, but we hope to have that out
19 for public comment within a month or so. And, again,
20 we will notify people when that is out and actively
21 welcome your comments on that report.

22 The NEPA process that we will follow for
23 the waste confidence work is also designed to have
24 several opportunities for clear public engagement,
25 beginning with the public scoping process which is the

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1 first formal NEPA step as we develop the EIS.

2 We expect to have more public meetings.
3 We expect to have more webinars. We are seeking the
4 best ways to continue productive interaction.

5 There was a suggestion yesterday during
6 our waste confidence discussion that we have another
7 webinar some time during the comment period for the
8 waste confidence first report that I am talking about.

9 We are seriously considering that, and it looks like
10 we will be able to do that. And we will get more
11 information out about the date for that as it becomes
12 more set.

13 So I am going to move into the last part
14 of the discussion here, which is a little more detail
15 about how we are going to go about getting the
16 regulatory and technical bases together for our
17 extended storage and transportation program.

18 Just as way of background, here is a
19 picture of the foreground of one of these vertical
20 canister systems. As I said, these dry cask storage
21 systems are in use in 33 states now at a number of
22 powerplants. They were first introduced a little over
23 20 years ago.

24 The setups at the powerplants are what we
25 refer to as independent spent fuel storage

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1 installations. That's shortened to ISFSI. So if I
2 use that term, that's what I'm referring to.

3 NRC issues licenses for these independent
4 spent fuel storage installations, and also provides
5 certification of the cask systems for storage and
6 transportation. These are done under two parts of our
7 Code of Federal Regulations. 10 CFR Part 72 covers
8 storage systems, and 10 CFR Part 71 is for the
9 transportation.

10 There was a recent update just in this
11 past year to Part 72 that allows for longer periods
12 for the certificates and the licenses. Originally,
13 these were 20-year periods. They are now 40 years on
14 renewals.

15 The focus of course is on the safety
16 functions of the system, and what we will talk about
17 today is all of the safety-related areas that we will
18 be working on. Security is also an important part of
19 this. We are not going to talk about that
20 specifically right now. Security for these facilities
21 is covered under 10 CFR Part 73, and there is an
22 ongoing rulemaking right now to enhance some of those
23 regulations.

24 There will be work on the security aspects
25 of extended storage that will lag a little bit behind

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1 some of the technical work on safety. We want to
2 complete the initial rulemaking and look at ways that
3 you may need to enhance that, if necessary, for
4 extended periods.

5 So as I mentioned before, potentially we
6 could be changing the regulations, depending on what
7 we find from the technical aspect, and guidance that
8 we provide to our applicants as to what staff will be
9 looking for when they do reviews.

10 One of these things we could do at this
11 time is improve some of the integration of the
12 regulations for the entire back end of the fuel cycle,
13 and there has been suggestions that we could have
14 better integration between the storage and
15 transportation aspects.

16 We do need a clear technical basis for any
17 changes we make, so we are looking at developing that
18 basis now.

19 There is another initiative going on at
20 NRC within the spent fuel storage area looking at our
21 current licensing process, for ways to improve that
22 and have more efficient and effective ways of carrying
23 out that process.

24 There was a public meeting on that in
25 July, and that is, as I said, an ongoing activity, and

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1 there will be more news to that as it comes out.

2 We are certainly looking at risk-informing
3 our regulatory approaches. By "risk-informing," I
4 mean we want to keep the attention on those areas that
5 have the greatest significance for performance and of
6 course safety.

7 Here is the approach we plan to be taking.

8 Broadly, there is three steps. Initially, we will be
9 looking at the technical basis, identifying what
10 issues are associated with long-term storage, and
11 perform the necessary research on those technical
12 issues.

13 Now, NRC will be doing some of this
14 research itself as needed, but we also expect that
15 industry and other parties, including the Department
16 of Energy, will be involved and will be gathering
17 information as well.

18 We will also be identifying what revisions
19 we need to the regulatory framework, and then, as
20 appropriate, make any revisions to the regulations
21 through our regular rulemaking process, revise
22 guidance, or develop new guides that of course keep
23 our staff capabilities at the level they need to do
24 effective review.

25 Our plans break out into three phases.

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1 The first phase, as I said, is identifying the issues.

2 We are close to the end of that initial phase, and
3 the report that I mentioned will have those issues
4 identified and laid out with some prioritization to
5 them.

6 The next phase would be to perform that
7 research. And again, as I said, NRC will be doing
8 some of the research, but industry, Department of
9 Energy, and some academic groups are also involved in
10 some of that research that we will be evaluating and
11 using as needed.

12 And then, the last phase would be any
13 changes that are needed to the framework.

14 Here are some rough timelines, and these
15 of course depend on how things progress and the
16 availability of resources at NRC. As you can see, in
17 2011 to 2012, we are closing out this issue
18 identification phase, and we will be developing a plan
19 called the regulatory program plan here to lay out how
20 we will be proceeding over the next several years.

21 As we pull that plan together, and we have
22 the technical issues identified, we will be beginning
23 the issue resolution phase and going through a
24 regulatory issue identification process also in 2012,
25 the following year, to look at areas of the

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1 regulations that may possibly be impacted by any new
2 information that we have for the extended storage and
3 transportation questions.

4 In the regulatory, technical, and issue
5 resolution phase, we will have a series of reports
6 probably put out periodically as research draws to a
7 close. That is the long leg of this exercise lasting
8 over several years. At that end of that, we will
9 develop a regulatory basis document which will be used
10 to support any potential rulemaking or revisions to
11 guidance.

12 And, again, these are just how we see the
13 timelines emerging right now, certainly subject to
14 change on something that is going out here for several
15 years.

16 The technical issues that we are working
17 on right now, we are looking at these systems, and I
18 am going to talk in a minute about a few potential
19 issues. We have broken the system down into their
20 components and looked at their individual component
21 safety functions and how they operate together to
22 provide a safe means of storing fuel.

23 This is an example of a canistering
24 system. As I mentioned, some designs have a more
25 integrated canistering cask, and similar issues apply

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1 to all. Primarily, the safety functions for all of
2 the systems can be broken out into a few simple
3 categories -- containment, confinement, keeping the
4 fuel inside as originally loaded, control of
5 criticality to ensure that there are no inadvertent
6 criticality events within these containers, shielding
7 to make sure that the radiation doses at the outside
8 of the systems are low enough that there is no hazard
9 to the public or to workers.

10 And retrievability is part of our policy
11 right now, that fuel should be able to be retrieved
12 from these canister systems at the assembly level.

13 How we get there -- there are a number of
14 structural, mechanical materials, thermal
15 considerations that are done in the reviews to
16 demonstrate that these safety functions can be met.

17 Here is one example of a potential
18 technical issue that we are looking at, and that is
19 the behavior of the cladding on the fuel over long
20 periods of time. Reactor fuel in lightwater reactors
21 is uranium oxide that is enclosed in a zirconium alloy
22 cladding. There are a number of different types of
23 cladding in use today.

24 The primary safety functions are
25 confinement, to keep all the fission products of the

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1 fuel confined within the cladding in the physical
2 integrity of the fuel and the assemblies, more
3 retrievability, and that also provides geometry
4 control for criticality. It is easier to analyze
5 potential criticality when you know specifically the
6 geometry the fuel is in.

7 Some of the technical challenges that we
8 will be facing over long periods of time is higher
9 burnup fuels, which is the growing trend within the
10 nuclear industry, effects of temperature, both higher
11 temperatures on the cladding and then, as the fuel
12 cools over long periods of times, if those lower
13 temperatures have impacts on the cladding behavior.
14 There is a number of cladding types in use. There may
15 be new ones being introduced.

16 And then, an ongoing challenge in all of
17 these dry storage systems is if there are ways to
18 monitor or image or in some other way gain information
19 on the state of the fuel within a sealed canister
20 without having to reopen the canisters.

21 Another prime example of a technical issue
22 has to do with the integrity of the canister. The
23 canister of course has obvious confinement function to
24 keep the fuel assemblies within and providing an
25 additional barrier if there are cladding failure

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1 issues, and also to provide criticality control in
2 that the canister is the primary moderator exclusion
3 that keeps water from entering and coming in contact
4 with the fuel.

5 Some of the technical challenges are all
6 materials issues, primarily long-time -- long-term
7 corrosion of the canisters, especially in more
8 challenging environments, properties of some of the
9 internal material like the fuel assemblies and the
10 baskets that hold them in place, some neutron absorber
11 aging-related materials inside the canister, and of
12 course the question of monitoring a sealed canister to
13 understand how it is behaving, both internally and the
14 state of the canister itself.

15 A third example goes to the overpack. The
16 overpack provides important safety functions and
17 shielding, and to optimize heat transfer. These
18 systems, as I said, are dry. They depend on natural
19 convection of the air around them to carry heat away.

20 The overpack, as you can see on the right-
21 hand side, it is not immediately in pack, but these
22 have air vents for natural circulation of air to keep
23 the heat away, which keeps the relative temperature of
24 the canister sufficiently low, so that other materials
25 issues don't arise.

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1 Some of the technical challenges of course
2 are long-term degradation of the response to any
3 natural events or external disruption. The overpack
4 has one advantage in that it is relatively easy to
5 inspect and monitor compared to the canisters inside
6 or the interiors of the canisters. So that makes that
7 much -- that issue a little bit easier to deal with,
8 but it still requires a rigorous inspection protocol
9 to make sure you are catching issues before they
10 become problematic.

11 Our current framework, as I mentioned, are
12 renewable term licenses. There is an initial license
13 for the facility and for the canister system itself.
14 These are renewable at 40-year intervals. There is no
15 limit in the current regulation to the number of times
16 a license can be renewed, but each license renewal
17 needs to come in with an aging management plan, which
18 is an important aspect of our regulatory framework.

19 The aging management plan describes how
20 the materials may have degraded or will degrade over
21 the license period, and what potential impacts that
22 would have on safety, what sorts of monitoring,
23 maintenance, and corrective actions can be taken to
24 mitigate those problems.

25 As I said, right now there is no term

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1 limit on the number of renewals, but certainly the
2 aging management plan is the key to justify a renewal.

3 And NRC will review these very carefully and make
4 sure that the aging management plan is adequate for
5 the next renewal period and certainly reflecting the
6 period that has passed before.

7 We have not done the rigorous regulatory
8 analysis yet. That is on track to happen beginning
9 this year. But some regulatory issues that may come
10 up involve things like integration between the
11 different states of the pack-in, storage,
12 transportation, and potential disposal, how the
13 regulations fit together, so we are not making things
14 more challenging in one area by making them easier in
15 another.

16 Certainly, the long-term integrity of the
17 cladding and the interior internals of the canisters
18 have implications for the retrievability function that
19 we now would like to preserve. So that is one of the
20 potential regulatory issues to deal with that.

21 And, as always, financial assurance is an
22 important consideration, especially in facilities
23 where you have moved into decommissioning and there is
24 not an active powerplant at the site. It is important
25 to make sure that there is assurance that things can

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1 be maintained by the licensee in a safe and secure
2 manner.

3 So, as I said before, stakeholder
4 engagement is an important part of this process. We
5 will be providing periodic updates to the Commission,
6 which will be available to the public, as we move
7 forward through this program. We will be issuing a
8 number of reports for comment, and certainly the first
9 one, as I mentioned, for the EST program is the
10 identification of the technical issues and
11 prioritization.

12 We are building in this report on previous
13 work that was done by the Department of Energy, the
14 Nuclear Waste Technical Review Board, the Electric
15 Power Research Institute. Several other groups have
16 looked at some of these issues.

17 We are taking those reports, pulling them
18 together, looking at the state of the knowledge of the
19 various issues and the importance for the safety
20 functions as we go forward, to develop our own NRC
21 prioritization. So that first report will be coming
22 out in the near future, and there will be subsequent
23 reports as we move forward on the technical issue
24 resolution.

25 We are working with industry and the

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1 Department of Energy in a number of ways. There is a
2 program run by Electric Power Research Institute,
3 which is promoting collaboration, and NRC is involved
4 with that.

5 We will also be having regular meetings.
6 I don't know if they would happen annually, but
7 certainly on a regular basis we will be getting out to
8 discuss these issues with the public and with industry
9 and all of the participants in workshops to work
10 through the technical issues. So we certainly
11 encourage people to stay involved with this, and we
12 will use our email list as best we can to keep you
13 updated as these things are coming up.

14 So in summary, even as things change in
15 the national environment, assuring continued safe and
16 secure storage of spent fuel is NRC's main goal in
17 this area. We are preparing to develop a regulatory
18 framework to support that and coordinate the technical
19 work among ourselves, among the other interested
20 parties doing the work, and with the environmental
21 impact analysis that we are doing to support the waste
22 confidence.

23 And there will be opportunities, as we go
24 forward, for stakeholder input through public
25 meetings, workshops, draft reports, and more webinars.

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1 So I thank you very much for your
2 attention, and we can open it up for questions now.

3 MS. JANAIRO: Okay. Great. Thank you
4 very much. If anyone has a question or would like
5 clarification, please raise your hands, and I will
6 unmute your line so you can your question. Another
7 option is to type the question in the questions pane
8 in your webinar console.

9 We have a hand raised. Rick Moore, we
10 will go to you first. Hold on, Rick. Try again.
11 Sorry.

12 MR. MOORE: Can you hear me okay?

13 MS. JANAIRO: Yes.

14 MR. MOORE: Okay. You mentioned several
15 times integration is an important thing that you are
16 looking at, particularly between storage and
17 transportation. And as I understand it, there are
18 several of these canister systems currently in use
19 that the canister is probably not suitable for
20 transportation.

21 So what I'm wondering is, as you look at
22 the issues of integrity of cladding over time, it
23 seems like the longer the cladding is subject to the
24 heat and stress, et cetera, that it becomes -- that it
25 is actually brittle. You really wouldn't want to have

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1 to recask your fuel in order to transport.

2 But if there is no initiative to make sure
3 that the fuel is canistered when it is put into dry
4 storage in canisters that are suitable for
5 transportation and potentially disposal, then you are
6 going to have to rehandle the fuel and recontainer at
7 some unknown future time.

8 Is that one of the regulatory issues you
9 are going to look at is to try to develop a way to
10 come up with a standardized canister requirement that
11 is suitable for at least transportation as well as the
12 dry storage?

13 DR. RUBENSTONE: I think this is both a
14 regulatory and a technical issue. It is my
15 understanding that, although not all existing storage
16 canisters are certified right now for transportation,
17 they are potentially certifiable, and there is not --
18 we haven't identified any that we don't think could be
19 certified for transportation. But we have to look at
20 it on a case-by-case basis.

21 Certainly, it is in our best interest that
22 we don't find ourselves in a situation where you are
23 forced to repackage something just to transport it,
24 and that is a prime area that we are looking at.

25 One of the goals of this, as I said about

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1 the integration, is to take a hard look at the process
2 that we are using now and see if there are ways to
3 better improve it, so that you are not left with
4 questions about whether a canister, you know, is
5 suitable for transportation.

6 Certainly, when things are loaded into
7 canisters now, any fuel that is classified as damaged
8 is canned within the canister. And other initiatives
9 are looking at canning different types of fuel as
10 necessary. You don't want to impose this unless it is
11 needed for safety.

12 But I agree with you that the idea of
13 minimizing the amount of handling is a good thing.

14 MS. JANAIRO: Do you have a followup?

15 MR. MOORE: Yes, another related question
16 if you will, is it mentioned that very high
17 temperatures are the enemy of the cladding in the
18 canister, et cetera. Is there any standard
19 requirement today on the thermal loading that is
20 allowed to go into a dry cask storage system? And are
21 you perhaps looking at the need to maybe extend the
22 wet cooling longer in order to reduce the thermal
23 loading on the canisters, since we are going much
24 longer term than originally thought?

25 DR. RUBENSTONE: There are limits, maximum

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1 temperature limits now for loading. And in some
2 sense, yes, very high temperatures are the enemy. But
3 it is not just high temperatures that you have to
4 worry about. As you go to longer terms, things cool
5 down and there are some issues that can arise at lower
6 temperatures as well.

7 Part of the loading issue has to do with
8 the burnup of the fuel. Lower burnup fuels cool off
9 sooner, basically, in wet storage compared to high
10 burnup fuels to reach the same thermal output.
11 Utilities now I believe balance, as they load
12 canisters, mix older, colder fuel with some younger,
13 warmer fuel to keep the thermal limits -- temperature
14 limits for the interior of the canister.

15 Some of the issues that have come up with
16 the cladding, which we are still looking into, are the
17 potential for some brittle ductile -- or ductile to
18 brittle transitions even at lower temperatures. So
19 when you are looking at for extended storage out over
20 several decades or more, some of the lower temperature
21 issues actually come in.

22 MS. JANAIRO: Okay. Thank you, Rick. We
23 will go next to Pat Dostie, and then we will go -- we
24 will turn to some of the written questions. And, Tim
25 Runyon, I also have you in the queue. But next we

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1 will go to Pat. Go ahead.

2 Well, Pat, try again. You're unmuted.
3 All right. We will come back to Pat. We will go to
4 Tim Runyon for his question. Tim, you're on.

5 All right. We will go to a written
6 question. I have a question from Christopher Amaro,
7 and the question is, "Does the NRC support the idea of
8 one or more consolidated interim dry cask storage
9 sites in the near future, as recommended in the Blue
10 Ribbon Commission on America's Nuclear Future draft
11 report?"

12 DR. RUBENSTONE: The NRC doesn't take
13 positions on those recommendations at this point. One
14 of our goals is to be able to safely regulate any
15 decision that comes forward. I should point out that
16 there has -- NRC did a license review and granted a
17 license to a -- what is effectively a consolidated dry
18 storage facility several years ago, which has not been
19 exercised yet, but the licensing action was part of
20 the record and the license exists. This is the
21 private fuel storage site that was proposed in Utah.

22 So we do have a process whereby we think
23 we can review and reach a decision on a consolidated
24 facility, but whether this exists is a matter of
25 policy --

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1 MS. JANAIRO: Okay. We will try again to
2 go to our two people who have their hands raised. I
3 don't know if it's a problem with the voice over IP or
4 what, but we will try again. Patrick Dostie from
5 Maine? Pat, if you're asking a question, no one can
6 hear you. It must be your microphone. Try typing
7 your question instead.

8 We will try Tim Runyon. Tim, you're on.

9 MR. RUNYON: I'm typing.

10 MS. JANAIRO: I can hear you.

11 MR. RUNYON: Can you?

12 MS. JANAIRO: Yes. You can try your audio
13 instead.

14 MR. RUNYON: Oh, okay. You can hear me
15 now?

16 MS. JANAIRO: Yes. Go ahead.

17 MR. RUNYON: Okay. I'm wondering about a
18 lot seems -- a lot of emphasis seems to be put on
19 cladding performance, and, you know, cladding
20 performance is something that we don't have a lot of
21 information on.

22 I know that even for fuel stored at the
23 Zion plant here in Illinois the cladding was all
24 right, but the fuel baskets and the bundles themselves
25 had to be reinforced before they could be moved

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1 around.

2 I'm wondering, you know, about the wisdom
3 of trying to evaluate cladding inside a container 120
4 to 300 years down the road. And if we are not going
5 to get ourselves, you know, immediately back into the
6 quagmire of no evidence of our study showed this and
7 your study showed that, if there isn't -- you know,
8 inside a closed container that's -- to me, it is like
9 a faith-based initiative or something, because, you
10 know, you are not really going to have a way of
11 evaluating it. Why wouldn't we look at some things
12 different or evaluate the outside container instead?
13 Focus on that.

14 DR. RUBENSTONE: Yeah. I'm sorry if I
15 gave the impression that cladding is the only thing we
16 are looking at. It is just one of several things, and
17 certainly the canister itself and the behavior of that
18 is very important.

19 But we do think that we can get some
20 insights from some laboratory work and other studies
21 on the behavior of cladding over the long term. And
22 the key in that is understanding the physical state of
23 it.

24 There are issues about hydrides which form
25 during irradiation and how they -- and they reran it,

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1 and then how those behave over a different temperature
2 range, from the very high temperatures in the reactor
3 down through the initial out-of-reactor temperatures,
4 and then as they cool down.

5 So I agree that it is challenging. I
6 agree that there are a number of issues that we need
7 to pursue in parallel. And certainly the cladding is
8 one, the performance of the container -- the canister
9 is very important, and then other aspects, like you
10 say, things like the fuel baskets, the assembly
11 structures, neutron absorbers, other shielding
12 materials. We are not eliminating any of them. I
13 just tried to give a couple of examples.

14 MS. JANAIRO: Tim, did you have a
15 followup?

16 MR. RUNYON: No, I'm still trying to
17 figure out how you can hear me.

18 (Laughter.)

19 MS. JANAIRO: Rest assured, we can. Okay.
20 I'm putting you back on mute.

21 Let's try Patrick Dostie one more time.
22 Patrick, go ahead, please.

23 Well, that's not working. So, Pat, if you
24 have a question, please type it in the questions pane.

25 If anyone else has questions, please

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1 either raise your hand or type your question in the
2 questions pane. It is okay to ask questions about
3 today's topic, but also, if you were a participant in
4 yesterday's webinar on waste confidence, there is --
5 we can raise a question on that topic, if something
6 has come up.

7 I see Jane Beetem has raised her hand.
8 So, Jane, we will go to you. Jane, I don't know if
9 you have a microphone on your computer, but you are
10 using voice over IP, so you need to make sure that
11 your sound settings include a microphone. If you
12 don't have that setup, go ahead and type your question
13 and we will read it for everybody.

14 Want to try again? Okay. Jane, go ahead
15 and type your question and we will take it that way.

16 I had a question about -- well, I guess
17 this could go for either waste confidence or extended
18 storage. It seems to me that the communities that
19 have the nuclear plants will take a big interest in
20 this. One of the themes that came up quite often at
21 the Blue Ribbon Commission workshop we had here in the
22 midwest was that the powerplant communities are happy
23 to have the operating powerplants. But after it shuts
24 down and they are left with the spent fuel for perhaps
25 generations, it is no longer such an advantage in the

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1 community.

2 So I'm wondering, to what extent will the
3 NRC reach out specifically to these powerplant
4 communities to get stakeholder inputs? And also, on
5 the subject of extended storage, will anything be done
6 to look at the specific conditions at each plant? And
7 I'm thinking along the lines of the difference
8 between, for instance, extended storage in Arizona
9 versus extended storage at one of the many plants that
10 are located on the shores of the Great Lakes.

11 DR. RUBENSTONE: Yeah, I can answer that I
12 think, Lisa. Certainly, the decommissioned plant
13 sites have unique challenges, not the least of which
14 is that once you have proceeded through
15 decommissioning, if there is still onsite storage,
16 that part of the site can't be released because of the
17 security considerations and the safety concerns. And
18 I think those communities would prefer to have the
19 site available.

20 There are also issues regarding the amount
21 of facilities that are still available for handling
22 fuel at a fully decommissioned site. There is not a
23 lot of infrastructure that is available besides to
24 load the fuel for transportation. So those are in
25 fact, yes, several unique aspects, and we recognize

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1 that we need to address those specifically. And we
2 will be doing our best to reach out to those sites as
3 well.

4 There are a number of existing ones, and
5 certainly as time goes forward there will be
6 additional decommissioned sites that need
7 consideration.

8 The second question was the differences of
9 the various sites. There is two ways we are looking
10 at that. On the extended storage question, from the
11 technical aspect, there are certainly very site-
12 specific things we need to worry about. Under the
13 current framework, each site gets its individual
14 review, and they have to deal with their specific
15 local conditions.

16 One example is different parts of the
17 country have different levels of seismic risk.
18 Certainly, the analysis that is done for these
19 interdependent spent fuel storage installations, say
20 on the west coast, are different than the seismic
21 analyses that are done in other parts of the country,
22 although we did prove recently that there are parts of
23 the country that, even though they don't have frequent
24 earthquakes, they still have earthquakes.

25 From the technical point of view, on

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1 extended storage there are a couple of issues that
2 have come up, especially on the canister aging --
3 material aging issues of the canister. There are some
4 conditions that can arise in salt water environments
5 near sea coasts, and where deposition of salt on the
6 canister may lead to different corrosion mechanisms
7 that need to be examined in detail.

8 We are looking at that specifically,
9 others. In more industrial areas, the air pollution
10 effects have to be considered. And certainly climate
11 effects in general, like you said, you difference
12 between Arizona and, say, Great Lakes or Florida in
13 terms of just general climatic impacts. So we are
14 looking at these sites specifically.

15 As Christine discussed yesterday in the
16 waste confidence, as we go forward trying to generate
17 an environmental impact statement to support the waste
18 confidence decision -- and we will be doing some
19 generalized analyses, but we have a number of
20 scenarios and composite sites that we are putting
21 together to make sure that we capture the
22 environmental impacts, not necessarily at every single
23 individual site, but sort of groups of sites.

24 So we will be considering, you know,
25 coastal sites versus inland sites, what sort of

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1 different impacts they might have, sites in highly
2 populated areas, relatively highly populated areas as
3 opposed to less highly populated areas.

4 Another way the impacts may be different,
5 sites that are, you know, close to transportation
6 networks as opposed to distant from transportation
7 networks. So we will be doing a number of scenarios
8 and a number of variations within those scenarios to
9 try to capture the full range of environmental
10 impacts.

11 MS. JANAIRO: Okay. Thank you. I have a
12 written question from Jane Beetem from Missouri. Her
13 question is, "The photos showed the cladding decay,
14 but how does NRC propose to place a camera or similar
15 device in a canister that will be able to document
16 cladding conditions over the very long term without
17 replacing the camera battery? It seems that opening
18 the canister to replace the battery may not be the
19 best option."

20 DR. RUBENSTONE: I would agree that
21 opening a canister to replace the battery is not a
22 good option. There is a couple of things we can do.
23 One example -- there already is a demonstration cask
24 of fuel that was in storage for about 12 years and was
25 opened and examined in some detail the materials

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1 inside. And that was opened about 10 years ago and
2 essentially showed no change in the condition.

3 So samples were taken; they were analyzed
4 in the laboratory. That canister was closed up again,
5 and it is still sitting. And it may be reopened again
6 as part of a demonstration program.

7 There are plans by the Department of
8 Energy, which are just now coming together, to set up
9 another cask demonstration program where there would
10 be a heavily instrumented and monitored cask with
11 higher burnup fuels set up that then could be
12 periodically reopened and examined as we go forward.

13 Those photos that we showed of the
14 cladding are not the kind of photos one would get if
15 they just looked at the assemblies within the
16 canister. Those are lab photos from experiments that
17 were done and then taken apart to look at the details
18 of how the cladding behaves. So we will be doing
19 additional experimental work, by NRC, by Department of
20 Energy, and other groups to examine things under
21 specific conditions that we expect to happen within
22 the canister.

23 There are monitoring techniques that we
24 are looking at. Some of them are remote sensing type,
25 actually, that may give you some idea of how the

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1 material is behaving within the canister, although
2 these are pretty challenging conditions to monitor
3 under. And these techniques are in the development
4 stage, but I know that DOE is working on that
5 specifically and we are looking at that as well.

6 So, yes, opening a canister is not a small
7 exercise. You need specific facilities in order to do
8 that, but we are trying to set it up so that we get
9 the best information we can in order to have a strong,
10 equitable basis for any regulatory decision.

11 MS. JANAIRO: Okay. We have another
12 written question, and then we will go to the folks who
13 have their hands raised. I'm sorry, Chris, was that
14 you?

15 MR. JACOBS: Yeah. Lisa, one other thing.
16 I don't -- I think I heard also about the decay rate
17 inside the canisters and the energy produced inside
18 the canister possibly being looked at to produce the
19 energy to power the camera inside the canister. So
20 that is something else that is also a possibility down
21 the road, or recharging the battery or whatever, where
22 you wouldn't have to open the canister up.

23 DR. RUBENSTONE: There are a number of
24 things examined. And, again, a canister -- a camera
25 by itself is not necessarily within the canister

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1 exactly what you are looking for. The key things that
2 we want to get the information on, and some things --
3 we have models that can tell us about -- the
4 temperatures within the canister at various stages and
5 on the outside of the canister, the behavior of the
6 cladding.

7 Again, some of these things you can't --
8 you can't really tell just by visual examination. So
9 it's important to be able to have laboratory
10 experiments or analog studies that can give you some
11 information on how these things behave over time.

12 And as I said, the behavior of the
13 cladding, in particular in high burnup fuel, is of
14 high interest because how it behaves at higher
15 temperatures and how that ages down to lower
16 temperatures is particularly important to keep the
17 integrity over long periods of storage and through
18 transportation.

19 MS. JANAIRO: Okay. The next written
20 question we have comes from Sandra Threatt in South
21 Carolina. "With an upcoming public information
22 meeting for a new reactor site in our state, can we
23 expect NRC to address extended storage issues at this
24 and other new reactor sites?"

25 DR. RUBENSTONE: I can't commit that we

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1 will have full discussions of extended storage at the
2 new reactor siting meetings. I can make an effort to
3 make sure that the people there are aware of the
4 issues and can bring that up.

5 Part of the purpose of the waste
6 confidence decision is to keep the storage and backfit
7 issues dealt with on this -- in this framework as
8 opposed to revisiting generic issues at each reactor
9 site. I can understand the concern of the community
10 that when you are buying into a new reactor you are
11 buying into the whole package of everything that goes
12 with it.

13 Certainly, I would -- as I said, I will
14 make sure that, from my point of view, the people who
15 are attending those meetings from the NRC are aware
16 that these concerns exist, and that they -- you know,
17 they can draw on what we are doing within the extended
18 storage and transportation program to help inform the
19 communities.

20 MS. JANAIRO: Okay. And Jane or Sandra,
21 if you have a followup to your questions, go ahead and
22 type those.

23 In the meantime, we will go back to Rick
24 Moore. Rick?

25 MR. MOORE: Yes, thank you. A number of

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1 years ago, like decades ago, NRC prepared a report
2 that is euphemistically called the "Modal Study." It
3 had a NUREG number. I don't remember what it was.
4 But at any rate, that study was basically used to
5 analyze the impacts of the system on transportation to
6 a severe accident and reached the conclusion that both
7 criticality and containment were adequate for the cask
8 systems that they evaluated in that study.

9 And then, recently the NRC has been
10 looking at the possibility of performing a formal
11 study. I'm wondering if -- first, if there is any
12 thought about going back and revisiting the modal
13 study and reevaluating the response that was predicted
14 from that work based on cladding and canisters and
15 baskets, et cetera, that have perhaps degraded over
16 time because of the extended storage.

17 And then, the second part of the question
18 is, if you look at the package performance study in
19 the future, would you consider looking at the material
20 that is degraded because of extended storage as part
21 of that study?

22 DR. RUBENSTONE: I think those are both
23 good suggestions. We are looking at, within the
24 broader transportation initiative, as part of this
25 extended storage and transportation, the question of

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1 how potentially degraded older materials are going to
2 behave in transportation accidents.

3 And the study that you referred to I think
4 was the nominal accident scenario and the behavior of
5 the canister or cask system to withstand a nominal
6 nine-meter drop I think, and behavior of the cladding
7 in that condition.

8 So, yes, we will be including that as part
9 of our work -- the conditions that could happen during
10 normal transportation and during the transportation
11 accidents as far as how that -- how the older,
12 potentially degraded from aging material will behave
13 in that.

14 And, yes, the two key things in any
15 accident analysis for transport of spent fuel are
16 containment and prevention of criticality events.

17 The package performance study has been
18 discussed for some years. And as that evolves, I
19 don't think it is in -- there is a specific date or
20 experimental design in hand right now. But including
21 aspects of degraded materials I think is important, if
22 that goes forward or when it goes forward.

23 So, yeah, I think we are on -- we are
24 keeping in mind all of these issues. And, yes, the --
25 our previous work on storage would need to be relooked

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1 at in case any of the material properties have in fact
2 gone downhill.

3 MS. JANAIRO: Okay. Rick, do you have a
4 followup?

5 MR. MOORE: Yeah, a quick followup. If
6 you look at those issues, would you consider having to
7 look at the regulatory framework for licensing cask
8 systems, given what you find, i.e. the drop test, the
9 fire test, emergency test, whether those accurately --
10 or would still be adequate to evaluate a new cask
11 system with potentially degraded canister assemblies,
12 baskets, et cetera?

13 DR. RUBENSTONE: Yes, that's exactly what
14 we would be doing. And the regulatory framework --
15 once we have the technical bases, make sure that the
16 regulatory framework adequately captures it.

17 It was just pointed out to me by some of
18 -- one of my colleagues here that that is NUREG-6672
19 is the modal study, and that it, yes, in fact is being
20 looked at right now for update.

21 So, yes, you need to make sure that the
22 regulatory -- current regulatory framework, any
23 changes that you would want to make can be
24 accommodated, and we have the technical basis for
25 that.

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1 MR. MOORE: Thank you.

2 MS. JANAIRO: Thank you, Rick.

3 Okay. We will turn to Ralph Best now to
4 ask your question.

5 MR. BEST: Hi. Can you hear me, Lisa?

6 MS. JANAIRO: Yes, we can.

7 MR. BEST: Okay, good. My question -- I
8 wrote my question, but the question has to do with the
9 confidence -- the waste confidence investigations that
10 will be ongoing and whether or not those
11 investigations will consider loss of institutional
12 controls as one of the future scenarios.

13 DR. RUBENSTONE: I am going to ask
14 Christine Pineda, who is our project manager for the
15 waste confidence, if she can answer that for you. She
16 is just getting online here.

17 MS. PINEDA: Okay. I just need to unmute
18 myself there.

19 Okay. I'm not sure if you were in
20 attendance at yesterday's webinar, but one of the main
21 assumptions we have for the environmental impact
22 statement for the long-term waste confidence update is
23 the maintenance of -- or the continued regulatory
24 infrastructure or regulatory program that storage of
25 spent nuclear fuel and high-level waste would continue

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1 under a fully regulated program similar to the program
2 that we have today. And that any developments that
3 are needed down the road to accommodate aging
4 phenomena or other issues would be incorporated into
5 the regulatory structure.

6 And we -- the term "institutional
7 controls" I think is used more in the context of a
8 disposal site where you develop a disposal site and
9 place the waste, and then there is a period of time
10 where there is a certain amount of monitoring, and
11 then at some point the site is -- there is no more
12 monitoring, and so then there is -- it is the end of
13 that period.

14 But this isn't the same -- this -- we are
15 not assuming this would be the same situation. We are
16 assuming it is storage, just as it is today. So we
17 are not looking at a total loss. For example, DOE in
18 their Yucca Mountain analysis looked at a loss of
19 institutional control -- of institutional controls,
20 and we are not looking at that.

21 MS. JANAIRO: Ralph, do you have a
22 followup?

23 MR. BEST: Well, I was going to mention
24 that the Yucca Mountain EIS did consider the no-action
25 alternatives in which ultimately institutional

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1 controls might be lost, and evaluated the impacts of
2 losses of those controls.

3 That would help I think in some way to
4 address the question Cort Richardson asked yesterday
5 about whether or not the actions to investigate waste
6 confidence and, in essence, might create a situation
7 where there is sufficient confidence to take no action
8 as far as long-term disposal.

9 So the alternative of course is to
10 investigate what actions -- what consequences might
11 arise if there were, over the long term, a loss of
12 institutional controls as a way to help to emphasize
13 the importance of disposal action.

14 MS. PINEDA: Well, just to clarify
15 regarding the EIS. The no-action alternative for the
16 NRC for this EIS, because the EIS is for a long-term
17 update of the waste confidence rule, so the no-action
18 alternative is not to update the rule.

19 And so what we are doing is we have four
20 storage scenarios that we are proposing to analyze the
21 impacts for extended storage, but we are not proposing
22 any of those actions.

23 Our proposed action is really -- is to
24 update the rule, if our EIS analysis shows that we
25 can, for example, make a statement that spent fuel or

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1 high-level waste can be stored beyond -- you know, for
2 some period beyond the current 60 years past license
3 life. So that is what our proposed action/no-action
4 alternatives would be.

5 Also, I think for -- this situation is
6 different from Yucca Mountain in that we are -- we are
7 looking at a limited -- although it is extended
8 storage, it is a limited period that we are looking at
9 -- a couple hundred years versus I think DOE's
10 analysis -- they had two different -- or two different
11 sub-analysis I guess -- analyses of the -- their no-
12 action alternative of just leaving it in place. And
13 literally they just left it there, and it was parallel
14 to their analysis of disposal in a repository.

15 So I think it went out to like a million
16 years or something. And we are just not looking at
17 that kind of timeframe, and I think -- and we have
18 made the assumption that controls would be -- would
19 remain in place for the couple of hundred years that
20 we are looking at.

21 MS. JANAIRO: Ralph, did you have anything
22 more to add to that?

23 MR. BEST: I think we have discussed it
24 sufficiently. I understood -- I do understand that
25 the EIS the NRC would prepare, the no-action would be

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1 the action of not changing the regulation. So, but I
2 just wanted to raise the issue, since we are
3 discussing long term, and far into the future where no
4 one can really know whether other situations were
5 being considered.

6 I think we have addressed it. Thank you.

7 MS. JANAIRO: That was a good point, and
8 thank you for raising that.

9 Christine, I was going to ask if you would
10 be able to pull up your slides from yesterday to show
11 what the four possible actions are that you are
12 considering.

13 And in the meantime, while you are doing
14 that, I will read a question -- a followup from Jane
15 Beetem, so that she can get an answer. "How would you
16 estimate the amount of time NRC plans to spend on
17 studying the cladding compared to the amount of time
18 to be spent on studying the ability of the canister to
19 contain radioactivity should the cladding fail in some
20 manner?"

21 DR. RUBENSTONE: I don't know if I can
22 give an estimate as to how much effort we are going to
23 put in each area. I know that, as our report is
24 developing, canister issues have risen to the top of
25 the list of things that we want to start working on

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1 right off.

2 There are cladding-related issues that are
3 in that category, mostly related to behavior of high
4 burnup fuel. So I can't tell you that one is so many
5 hours and another is so many other hours. They are
6 both in the high interest category, along with a
7 couple of other areas which have come out. And I
8 don't have the details of that report right in front
9 of me, but that will be coming out as a report for
10 comment very soon.

11 And NRC of course is going to put our
12 resources into place where we think we can get the
13 most efficient return on what we need to do. And we
14 are not ready to -- we are certainly not going to
15 change regulations if we don't feel we have a strong
16 technical basis for how we are going forward.

17 MS. JANAIRO: Okay. Thank you.

18 And thank you, Christine, for putting your
19 slide up. I had a question -- and I apologize if you
20 addressed this yesterday, Christine -- but is the NRC
21 going to be looking at the relative cost of each of
22 these scenarios as well as safety implications?

23 MS. PINEDA: We are going to be looking at
24 the costs of long-term storage. It is not going to be
25 a very detailed type of cost-benefit analysis, but we

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1 are going to be -- costs are one of the impacts, and
2 we are going to be doing a general assessment of the
3 costs of long-term storage.

4 So, for example, one thing I mentioned
5 yesterday is if you look at spent fuel or waste being
6 stored for a couple hundred years on a pad, at what
7 point might you need to repackage that fuel? Or would
8 you need to? And, if so, how often?

9 And of course that really factors into --
10 that really affects the costs. And other things that
11 affect the cost is just the -- is the ongoing
12 monitoring and the maintenance, the yearly maintenance
13 costs, and also I think security would affect costs.

14 So we are also going to be looking at
15 costs to a certain degree, but we are not doing a
16 highly detailed cost analysis.

17 MS. JANAIRO: Okay. Thank you.

18 If anyone else has questions, please
19 either type them in the questions pane -- oh, I see --
20 I see one. Here is a question from Jay Jones. "Can
21 you elaborate on the extended storage collaboration
22 project, an effort sponsored by the Electric Power
23 Research Institute, that is being currently conducted
24 with international partners?"

25 I'm sorry, Jim. Can you go again, please?

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1 DR. RUBENSTONE: Yes, I just need to get
2 unmuted. I can say a few words about that. That is
3 being organized by, as you said, EPRI, the Electric
4 Power Research Institute. It is a collaboration that
5 involves industry in the U.S., the Department of
6 Energy, EPRI.

7 NRC is involved as -- to provide input for
8 what the areas of concern are, and international
9 partners, which include informally a number of
10 national programs, and some interest by the
11 International Atomic Energy Agency, which has several
12 programs going on extended storage issues.

13 The goal of this is to coordinate
14 individual efforts to make sure that we don't
15 duplicate or miss areas. EPRI has issued a couple of
16 reports on that project including their technical
17 issues report.

18 It -- all I can really say about it is
19 that it is a good effort to keep industry focused on
20 the areas that they need to be focused on and
21 encourage people to work together to share data and
22 information, so that we get the technical information
23 as efficiently and effectively as we can.

24 Can I -- is there more you need to know at
25 this stage? It is just getting going.

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1 MS. JANAIRO: Jay has a followup. Go
2 ahead and type that, Jay, or we can try -- we can try
3 having you unmute your line. Raise your hand if you'd
4 like me to do that.

5 I will follow up -- and this may be
6 related -- Jim, you had mentioned that DOE was
7 conducting or planning to conduct another cask
8 demonstration project, and I don't mean to put you on
9 the spot to answer questions about another agency's
10 activities, but can you share a little bit more
11 information on that?

12 And perhaps if there is someone from the
13 Department of Energy with knowledge of that program,
14 please raise your hand, so we can unmute you and you
15 can share what information you have.

16 DR. RUBENSTONE: Yeah, I would certainly
17 defer to any DOE person who is on the line to do it.
18 My understanding is that this is still in the early
19 planning stages. DOE had been part of the effort --
20 as I said, the earlier demonstration project, which
21 NRC was involved in about 10 years ago, was opening
22 canisters or casks which were stored at the Idaho
23 National Laboratory, which is a DOE facility in Idaho.

24 And DOE has indicated that they would be
25 -- they are looking at planning and potentially

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1 supporting a similar demonstration project again
2 focused on high burnup fuel, which is one of the major
3 question areas going forward on how, if at all, high
4 burnup fuel would behave differently than the low
5 burnup fuels that were in the first demo project.

6 It is still within the planning stages,
7 and I don't think they have made any decisions. They
8 need to develop better defined goals and what sorts of
9 information we would try to gain from that, what sorts
10 of instrumentation could be added to the projects.

11 There are some regulatory concerns about
12 where it would take place, how the fuel would be
13 loaded, where it would come from, etcetera. So there
14 is a number of details that need to be worked out on
15 this, so we are still a few years away from getting
16 going on it. But they have expressed interest in
17 potentially supporting this, given -- if the resources
18 are available and they see as a relatively high
19 priority item for them.

20 And, again, if anyone from DOE is on the
21 line and wants to help out, I am glad to yield to
22 them.

23 MS. JANAIRO: Well, I don't see anyone
24 raising a hand, but perhaps they will soon.

25 Does anyone have any other questions about

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1 either today's topic, extended storage, or the topic
2 of yesterday's webinar which was waste confidence?
3 Oh, I see -- I do see Steve O'Connor raising a hand.
4 Steve, you need to type in the audio PIN that I just
5 sent you.

6 Okay. Never mind, Steve. Steve has
7 relayed a question through the questions panel. He
8 does not have a microphone on his computer. So he
9 says, "The Office of Nuclear Energy has the lead. We
10 are providing support as needed."

11 I don't know if we have anybody from DOE's
12 Office of Nuclear Energy on the line. If we do,
13 please raise your hand now.

14 And last call for any questions from any
15 of the participants on today's webinar before we turn
16 it back over to Chris Jacobs to wrap us up.

17 (No response.)

18 All right. Chris, we will go back to you.

19 MR. JACOBS: Okay. Well, thank you, Lisa.
20 Actually, I am going to give it over to Jim to wrap
21 up for today's session.

22 DR. RUBENSTONE: Thanks, Chris. And
23 thanks to all of the participants, and to Lisa and The
24 Council of State Governments for sponsoring this.

25 I would just like to wrap up -- to

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1 summarize some of the questions we got. I think there
2 were a number of very good questions -- questions
3 regarding integration of transportation and storage
4 and concerns about existing canisters and their
5 ability to be transported without additional fuel
6 handling, concerns about temperature limits and how
7 those are used in determining how we load,
8 consideration of the emphasis on the cladding
9 performance. And I hope I cleared that up, that we
10 are -- cladding is just one of the many areas we are
11 looking at. Canister performance is important.

12 Concerns about how one could monitor
13 inside a closed canister, which I agree is a
14 challenge. Potential for a consolidated dry storage
15 site -- that came from the BRC Commission.

16 I should just note that we are carefully
17 following the draft recommendations and the final
18 recommendations from the Blue Ribbon Commission, which
19 will be coming out I think in January -- their final
20 report. And NRC is looking at how that might affect
21 our programs.

22 Questions about extended storage at new
23 reactor sites, about revisiting the modal study on
24 transportation accidents, NUREG-6672, a question about
25 the waste confidence, and some of the assumptions

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1 within that and what the no-action alternative would
2 be. Again, cladding in the canister and a little bit
3 of discussion about the EPRI-led collaborative program
4 and the cask demonstration project.

5 So we got a very good discussion. And,
6 again, thanks to everyone. I hope you found this
7 webinar format useful, and I hope that you continue to
8 stay involved with us as we move forward.

9 Again, anyone who registered for this
10 webinar, we have your email address and we will add
11 you to our mailing list. And you should be getting an
12 email in the near future from our new email outreach
13 system for both waste confidence and the extended
14 storage and transportation program. So we would
15 appreciate it if you would use those, and we are going
16 to use those as our main way to reach out to people.

17 As noted yesterday, we may in fact be
18 doing another webinar with Lisa, potentially in late
19 January when the waste confidence paper is out, in the
20 public comment period to walk people through that, if
21 that would -- is seen as something that would be
22 beneficial.

23 So, again, thanks to everyone who
24 participated. Thanks to our hosts. And we will see
25 you on the next webinar or public meeting.

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1 MS. JANAIRO: Thank you, everyone. This
2 concludes our webinar. Have a great week.

3 (Whereupon, the webinar was concluded.)
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