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UNITED STATES NUCLEAR REGULATORY COMMISSION

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INDEPENDENT SPENT FUEL STORAGE

INSTALLATION (ISFSI)INSPECTION ENHANCEMENT

INITIATIVE RECOMMENDATIONS

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CATEGORY 3 PUBLIC MEETING

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MONDAY

MARCH 9, 2020

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The Category 3 Meeting convened at the U.S. Nuclear Regulatory Commission, 11555 Rockville Pike, Room 06D02, Rockville, Maryland, at 1:00 p.m., Jeremy Tapp, presiding.

NRC PRESENT

JEREMY TAPP, NMSS

MARLONE DAVIS, NMSS

DARRELL DUNN, NMSS

ANDREA KOCK, NMSS

ALAYNA PEARSON, NMSS

CHRIS REGAN, NMSS

TOMEKA TERRY, NMSS

ALSO PRESENT

DIANE D'ARRIGO, Nuclear Information and Resource Service*

JACK DESANDO, Exelon**

ANDREA JENNETTA**

MICHAEL KEEGAN*

ANTHONY LESHINSKIE**

KAYLENE WALKER*

* present via teleconference

** present via Skype webinar

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

1:02 p.m.

THE OPERATOR: Welcome and thank you for standing by. At this time, all participants are in a listen only mode until the question and answer session of today's conference. At that time you may press *1 on your phone to ask a question.

I would now like to turn the conference over to Mr. Jeremy Tapp. Thank you, you may begin.

MR. TAPP: All right, thank you. And good afternoon, and good morning to those in the west.

My name is Jeremy Tapp. I'm a Storage and Transportation Inspector in the Inspection Oversight Branch here at the NRC.

I want to welcome everyone attending this public meeting today on NRC's Independent Spent Fuel Storage Installation Inspection Program Enhancement Initiative.

I'll just ask really quick, for those on the Skype, just to type in and make sure, give us verification that you can see the slide in your screen. Just make sure everything is working.

Public participation is actively sought in this meeting. And we will be taking any comments and questions after the NRC presentation. With the

remainder of the meeting time reserved for public feedback.

The NRC has long recognized the importance of a positive nuclear safety culture. And we expect that all individuals and organizations performing or overseeing regulated activities involving nuclear materials should take the necessary steps to promote a positive safety culture.

You can find NRC's safety culture policy statement on our public website. And we encourage everyone to raise safety concerns.

And we will promptly review and appropriately resolve those concerns. And also provide timely feedback as appropriate.

A summary of the meeting will be prepared by NRC Staff and will be placed in ADAMS. NRC's electronic document management system where it will be publicly available.

If a document is presented by any party, it will become part of the meeting record and will become publicly available. Unless it contains proprietary or sensitive security information and should be withheld from public disclosure under 10 CFR 2.390.

The meeting summary will include a general

meeting outline and synopsis of the comments and questions received at the meeting. And our goal is to have the meeting summary completed within 30 working days after the meeting.

Although we intend to have an open dialogue today, please note that there will be no regulatory commitments made during this meeting.

I'd also like to ask that each of you please send me an email to let me know that you participated in the meeting. My email is the one on the public meeting notice, and is jeremy.tapp@nrc.gov. And this would be so that we could have a, as complete of an attendance record as possible.

I think first we would go around the room here at NRC for introductions. And then I will turn the meeting over to Andrea Kock for opening remarks.

MR. DAVIS: All right. Here in the room is Marlone Davis. I'm the Senior Storage and Transportation Safety Inspector.

MR. REGAN: Christopher Regan, Deputy Director, Division of Fuel Management.

MS. KOCK: Andrea Kock, Director of the Division of Fuel Management.

MS. TERRY: Tomeka Terry, Project Manager in IOB.

MS. PEARSON: Alayna Pearson, I'm the Acting Chief for the Inspection Oversight Branch.

MR. DUNN: Darrell Dunn, Senior Materials Engineer.

MR. TAPP: Okay thanks everyone for that. So, Andrea Kock, go ahead.

MS. KOCK: Jeremy thanks for giving me a few minutes just to open up. I'm going to really brief so that we can get to the presentation and then open it up for questions. Which is the most important part of the meeting.

I wanted to thank everybody for participating. Can those on the Skype hear us?

MR. TAPP: It's right there above those. It's right here. Just click right here.

MS. KOCK: Okay, we'll go ahead. What you'll hear today in the presentation that Jeremy is going to give is about the culmination of about a year's worth of work between the NRC staff and its takeholders to develop recommendations to enhance the ISFSI inspection program.

The intent of this review, if you step back to last spring, was to take a holistic review of our program to ensure that we're focusing on the issues that are most safety significant and an ensure

a comprehensive and consistent program.

We hadn't done such a holistic review in about the last 20 years, and so last spring we decided it was time to step back and incorporate the 30 years of operational experience that we've had with the ISFSI program. And that was the purpose of our review.

A little bit about how we got here. What you'll hear today is that there is a working group that was put together at the NRC that was made up of staff members from each of the regions that inspect ISFSI, as well as folks from our headquarters and our operator reactor office. We wanted to get that broad spectrum of views.

They followed a very objective process that included looking at qualitative information, as well as quantitative risk information. As I mentioned, they looked at operating experience over the last 30 years. And the subject matter expertise of the group that was put together.

I will say there was a diverse set of views. We've heard over the last year views ranging from, we shouldn't make any changes at all to our inspection program to views that we shouldn't be inspecting ISFSIs at all. So that is a pretty diverse

set of views.

We considered all of those views moving forward. And you'll hear today what the working group came up with in listening to those views.

We did have several public engagements over the last year on these issues so that we can fully consider all of the views and understand them. I just wanted to thank you for your engagement over the last year on these issues.

I think what you'll hear from Jeremy is that there are areas of the inspection program where we're recommending additional inspection focus. And those would be on the areas that are more risk-significant.

And there are other areas of our inspection program where the working group is recommending that we reduce our inspection focus. And those are on the areas that are less significant.

What you're going to hear is the working groups final set of recommendations. We wanted to touch base with you because at the last public meeting there was still a few different recommendations being considered by the working group.

And the working group now has come together with one recommendation. Although the agency

has not made a final decision on how we will move forward. What you're going to hear from Jeremy today is the working group's proposal to management.

What we would like to hear from you are any major areas of omission or interests that you have. I would like to answer any questions you have on the proposed recommendations.

We will consider any feedback that we hear during today's webinar. With that, I'm going to turn it back to Jeremy to move along with the presentation.

MR. TAPP: Thanks, Andrea. Appreciate the opening remarks.

So, good afternoon again. As Andrea just stated, the purpose of this presentation is to provide an overview of the independent spent fuel storage installation, or the ISFSI inspection program enhanced initiative. Including the proposed recommendations.

Next slide. I'll start first with a brief background on how this initiative was started.

Over the past number of years we've, like Andrea said, received some feedback to provide a more risk-informed ISFSI inspection program performed out of the NRC's four regional offices.

And in September 2018, the NRC received a recommendation from nuclear energy institute, or NEI,

for ISFSI inspections. It's part of the larger operating reactor oversight program, or ROP enhancement recommendations letter.

So ultimately, in response to all the feedback received, the NRC Staff initiated a review to enhance the ISFSI inspection program in June of 2019.

Next slide. The ISFSI inspection enhancement working group was created with subject matter experts representing all four regional offices. That included specially trained and qualified ISFSI inspectors and a reactor resident inspector.

Also, NRC headquarter staff was represented with individuals from the Office of Nuclear Material Safety and Safeguards, or NMSS. And the Office of Nuclear Reactor Regulation.

The primary objective of the team was to evaluate and enhance the existing ISFSI inspection program by developing a clear, more risk-informed comprehensive and consistent approach to ISFSI inspections that focuses on those areas most important to safety.

And that's really the key message that I want to emphasize here with this slide, is that the working group strives to focus the program on those areas most important to safety to ensure the

reasonable assurance of adequate protection.

This initiative incorporated our best practices learned from implementation of the current program and evaluates stakeholder recommendations to enhance and improve the NRC's oversight of ISFSIs.

And the ultimate goal of enhanced program is to improve the effectiveness, the efficiency and the consistency of ISFSI inspections.

Next slide. The ISFSI enhancement team focused on areas of responsibility out of the regions for ISFSI operational safety.

And these areas include the first full bullets on this slide. Which includes onsite construction, such as the ISFSI storage pad and concrete storage overpacks, dry runs or pre-operational inspections, which are performed before the first time a licensee loads fuel into a canister or switches canister designs, initial in routine canister loadings, and routine monitoring of dry casks stored on the ISFSI pad.

The team did not review transportation inspections, vendor inspections of dry cask and transportation vendors performed out of headquarters, aging management inspections, as that is part of a separate effort that is current ongoing, or security

inspections of ISFSIs. As well as were not part of the feedback received from internal and external stakeholders.

Next slide. As part of the effort of the working group to have a more risk-informed program, they considered information from all available resources. This included numerical estimates from probabilistic models, qualitative analyses from probabilistic models, subject matter expertise, operating experience, which includes more than 30 years of inspection and industry experience, and the use of applicable data from other program areas.

Five safety focus areas, or risk-significant areas, were identified for inclusion for the inspection oversight program. Which are occupational and public exposure, fuel damage, confinement or canister integrity and impact to operating plant operations.

These focus areas are structured as a performance expectation and address those areas of greatest safety significance for a dry cask storage program. The occupational and public exposure safety focus areas encompass the direct impact of dry cask operations on workers and the public.

The fuel management and confinement

canister integrity safety focused areas are those that encompass radiological barriers to workers in the public and the impact to plant operation safety focus area encompasses activities. And they impact site operations and risk metrics for operating reactors and the NRC's safety goal policy for operating reactors.

Next slide. The working group applied the risk insights to the review of the ISFSI inspection program. And that methodology was used to determine recommendations for the frequency of performing ISFSI inspections and the level of effort involved in each type of inspection.

In addition, the working group assessed the qualification and training requirements of inspectors performing these inspections to develop recommendations for enhancement in this area. And overall, when the working group developed these recommendations, it was all looked at and performed through the lens of these five safety focused areas just discussed on the previous slide.

Next slide please. So what was the methodology that the working group used to develop the recommendations and apply risk insights to the overall ISFSI inspection program.

There was an objective process and a

holistic approach that would implement a more risk-informed performance based inspection program by ranking the relative risk of dry cask storage loading activities based on radiation dose to workers and the public, the likelihood of occurrence and consequences of postulated accidents and events and the defense-in-depth assumptions made by licensees and safety analyses.

Probabilistic model results were taken into account from both the ISFSI pilot PRA, probabilistic risk analysis, and a material systems risk analysis.

Operation experience was used in the past 30 years of ISFSI operations. And subject matter expertise was utilized from those on the team and others that were consulted during the groups work.

Operating experience and subject matter expertise were used during the line-by-line review performed on the inspection procedures in order to risk-inform and develop the level of effort to perform them.

One item that was developed as part of this all of the above approach that I wanted to specifically point out was the risk prioritization tool that includes all key activities or processes

subject to inspection and then rates them based on risk-significance.

This tool was developed by ranking the risk of each inspection activity included in all the ISFSI inspection procedures according to the five safety focus areas just discussed. And this tool will be very useful in focusing the inspection effort on the most risk-significant activities and ensuring consistency.

Next slide. Here we wanted to point out up front some of the key considerations during development of the proposed recommendations.

As I stated before, one of the primary objectives of the working group was to focus ISFSI inspections on those areas most important to safety. Which would result in an increased inspection effort for those risk-significant areas and any proposed decreases in inspection effort would be in areas of inspection overlap with other inspection programs and in low risk-significant activities.

By focusing more effort in a risk-significant areas, will allow for greater flexibility in observing and assessing those operations. In addition, stakeholder feedback was considered during the assessment process and will be discussed in more

detail later in this presentation.

Next slide. Next I'll go through the working group proposed recommendations. For inspection of frequencies, the recommendation of the triennial frequency for routine or recurring inspections or those performed after the construction, pre-operational and initial voting inspections.

One of the benefits of the triennial cycle frequency is the flexibility it provides in timing the inspection with loading operations and the option to perform multiple shorter duration inspections over the triennial cycle.

This recommendation was informed by operating experience and subject matter expertise by a review of inspection results from inspections completed both every two years and every three years. As is currently allowed by the program.

The results did not show an increase of issues or violations for those inspections completed on a three year periodicity versus the typical two year frequency.

It's also informed by inspection frequencies from similar materials facilities such as irradiators and fixed radiographic installations.

Irradiator systems and fixed radiographic

installations share characteristics of dry cask storage operations and storage strength and in some operations.

The self-shielded irradiators are similar in concept to dry cask storage systems and passive storage on the ISFSI storage pad.

And fixed radiographic installations and other types of irradiators, including pool irradiators, compare in concept to the dry cask storage loading and unloading operations.

An assigned priority number was given to each type of inspection denoting the average number of years between inspections.

A Priority 2 is given to the fixed radiographic installation and other irradiators. Meaning that the licensee is generally inspected on a two year frequency.

A Priority 5 is given to self-shielded irradiators, meaning that the licensee is generally inspected on a five year frequency.

And since ISFSI inspections are performed during, mainly during voting operations whenever possible, they align more closely with the irradiators and fixed radiographic installations inspected on a two year frequency that include the inspection of

operational activities and not just passive storage and monitoring.

When combining these comparisons of ISFSI to byproduct material systems with risk insights, based on the passive nature of safety systems of ISFSIs, previous inspection results and the need for flexibility and the program to time installations with loading operations, our working group recommended a triennial inspection frequency.

The working group also evaluated operational experience associated with reactor sites performing extended ISFSIs loading campaigns. And these campaigns typically occur after operating reactors are permanently shut down with the intent to completely offload the spent fuel pool to an ISFSI.

The working group determined that additional oversight was necessary during these loading campaigns. And that's due to the significant increase in the number of canister loadings compared to the normal loading campaign.

And the additional oversight provides the opportunity for timely evaluation of operational and programmatic activities at decommissioning facilities where staffing is usually reduced. The working group recommends that the frequency of these inspections by

raised from the current when required, to quarterly throughout the extended offloading campaign. And once complete, return to the triennial frequency.

Next slide. For the qualification and training of ISFSI inspectors to allow for flexibility and efficiency in the implementation of the ISFSI inspection program, the working group recommends establishing a cross-qualification program for reactor inspectors already fully qualified under the process for reactor resident inspectors or engineering inspectors. Which will ensure qualification of ISFSI inspectors regardless of the position of the individual completing the inspection.

In other words, the recommendation is not who does an inspection, only the inspector is qualified for the inspection being performed.

The working group recommends that ISFSI inspectors that are not already qualified under the operating reactor inspectors process continue to be qualified using the formal qualification process currently established and defined in the NMSS qualification program for regional ISFSI inspectors.

In recognition that some reactor resident inspectors who have some qualifications in certain aspects of the ISFSI inspection program currently

complete ISFSI inspections of only fuel loading campaigns, though working group developed, as part of the cross-qualification program, a new partial qualified concept that streamlines the qualification and training process for those reactor inspectors already fully qualified and only perform those inspections.

This provides an efficiency to enable staff who will only perform these limited inspections to have the requisite expertise and the training that aligns with the activities inspected and supplements the training, qualification and experience those fully qualified reactor inspectors have already retained.

The partial qualification requirements include a combination of formal training courses, individual study and on the job training activities. And these requirements focus on those areas of most risk-significant ISFSI operations that require specialized knowledge of information specific to ISFSI loadings.

These areas include, but are not limited to, fuel selection and loading, heavy loads, welding, nondestructive examination, and canister drying and backfill.

In addition to the partial qualification

process, the cross-qualification program details the requirements for qualification to conduct the full spectrum of ISFSI inspections for already qualified reactor inspectors.

The additional requirements for conducting construction and pre-operational inspections focus on those areas with most risk-significance to those ISFSI activities and require specialized knowledge. These areas include, but are not limited to, health physics, concrete construction and ISFSI pad design.

Next slide. And for the level of effort for routine loadings and monitoring inspections, the team performed a line-by-line review of the applicable inspection procedure and determined the hours needed for each of the risk-significant inspection activities.

Informed by risk insights, some specific examples of risk-significant areas that were identified by the working group include the control of heavy loads and fuel selection. Also, to reduce unnecessary inspection effort while maintaining safety, the working group strive to minimize areas of inspection program overlap.

Overlap was identified mostly for ISFSIs that are co-located with the reactor because some

aspects of the program are included in the inspection procedures for the reactor oversight or decommissioning inspection programs.

The programs identified with overlap included, but not limited to, radiation protection, problem identification and resolution, security and safeguards and emergency preparedness.

The working group adjusted the scope of these program areas to appropriately focus on ISFSI specific activities rather than larger, programmatic adequacy.

So as you can see on the slide, the recommended level of effort for routine loading inspections is 96 hours every triennial frequency, plus an additional ten hours allocated as needed for follow-up of any issues between onsite inspections.

The working group also recommends the same inspection level of effort for extended loading campaigns as the routine loading inspections but at a quarterly frequency. Which represents an overall increase of level effort for those inspections.

The level of effort of 24 hours for routine monitoring inspections performed at both ISFSIs co-located at operating reactors and at away from reactor facility is not proposed to change from

the current inspection program.

The next slide. For prior to use ISFSI inspections, the inspection procedures performed include reviews of pre-operational testing, 10 CFR 72.212 evaluations and the ISFSI storage pad.

Operational experience, subject matter expertise and actual resource expenditure data was used by the working group to risk-informed the recommended level of effort associated with the prior to use inspection procedures.

The working group recognized that the level of effort for each of these procedures could very significantly, for each reactor side, based upon the combination of the dry cask storage design, the reactor site parameters and the requirements for any modifications to the reactor facility to implement the ISFSI operations.

Based on this variability, a line-by-line review of these IPs, or inspection procedures, to develop a standard level of effort would not be practical. And for this reason the working group used historical expenditure data and adjusted a level of effort for some procedures based on further risk-informing inspection requirements to ensure appropriate focus on the most safety significant

aspects as well as efficiency and consistency.

So a general license is required, under the 10 CFR 72.212, to perform site specific evaluations to demonstrate that a dry cask storage system approve, by a certificate of compliance, is suitable for use at a 10 CFR Part 50 reactor site.

Both 10 CFR 72.212 evaluation inspections and pre-operational testing inspections set the baseline for safe ISFSI operations and contain a large amount of risk-significant reviews. As such, a greater level of effort was determined to be needed, and appropriate, as indicated by historical data and was recommended.

For the 10 CFR 72.212 evaluation inspections, the recommendation is an average level in effort of 160 hours for each new licensee. And for pre-operational testing inspections, the working group recommends that the average level of effort be 200 hours per inspection.

Both the pre-operational testing and the 10 CFR 72.212 evaluation inspections include more and higher risk-significant activities to inspect as compared to the ISFSI storage pad inspection and therefore a greater level of effort was determined to be appropriate and was recommended.

For the ISFSI storage pad inspections, the working group recommends that the level be maintained at 120 hours for each new licensee or sites building new dry cask storage systems or switching to those. And overall, this represents about an 18 percent increase in inspection level of effort for pre-operational inspections.

So to summarize, the proposed enhancements to the program reflect an increase in inspection for activities that are most important to safety and a decreased in inspection for certain other activities, such as those already inspected by other inspection programs.

In addition, the recommended enhancements provide greater flexibility to perform inspections during more risk-significant operations and observe those operations in the field.

Next slide. So I'll quickly go through some of the additional areas that were considered by the team.

Recommendations were also provided in a number of additional areas for follow on efforts. These included assessment of the spent nuclear fuel transport and consolidated interim storage facility inspection areas to provide recommendations for

enhancement of inspection readiness.

Also included is the assessment of potentially forming a center of expertise for ISFSI oversight activities. And essentially this would be to create one location that all ISFSI oversight activities would be performed from.

And lastly, the team recommended development of a routine assessment of the ISFSI inspection program, which would help to ensure continued effectiveness, efficiency and consistency moving forward.

Next slide. All right, so how did we get to this point. First, the working group issued an initial assessment and recommendation memo on October 2nd of last year.

Stakeholder feedback was solicited from both internal and external stakeholders and was a key consideration in development of the current proposed recommendations.

Many public engagements, including ROP public meetings, any focused ISFSI enhancement initiative public meeting on December 2nd, 2019, as well as a presentation at the DSFM REG CON in King of Prussia, Pennsylvania in September 2019 to reach out to stakeholders in additional geographic areas.

The result is the updated proposed recommendations discussed today and referenced with the ADAMS accession number in the last bullet of this slide. And a link is also provided in today's public meeting notice.

Next slide. So next steps. As Andrea mentioned, a decision has not been made at this time. And NRC, in the near future, will be making a final decision on the recommendations and communicate that decision with the tasking memo planned to be publicly available around the March 30th time frame.

After the new inspection program documents will be planned to be updated based on the final decision, during the remainder of calendar year 2020, with the planned implementation of the new inspection program at the start of Calendar Year 2021.

And with that, my planned remarks are completed. So, I think the remainder of the time frame here we have open for comments and discussion and any questions from those participating.

First off I think, if you want to, we can go to those on the Skype, and see if anyone has any questions.

I think probably the easiest way is to let us know in the comment box if you have a question, and

we can open up the line if you would like to speak or we could take any questions from the comment box as well.

THE OPERATOR: Okay. If you would like to ask a question on the phone line, please dial *1, unmute your phone and record your name clearly when prompted.

If you would like to withdraw a question, press *2.

Mr. Tapp, this is the conference operator. Would you like to take a question on the phone line?

MR. TAPP: That would be fine. Sure.

THE OPERATOR: Okay. The first question comes from Mr. Michael Keegan. Your line is now open.

MR. KEEGAN: Hello, this is Michael Keegan with Don't Waste Michigan. Can you hear me?

MR. TAPP: Yes.

MR. KEEGAN: Yes, thank you. Could you tell me if there were to be a sudden failure, how long would that occur?

Would that be something that would start slowly and you see it coming?

I'm concerned about the lack of inspections that there could be the failure of a cask and, so, could you tell me how long it would take for

a cask to fail, if it does fail? So that's my first question.

MR. TAPP: Darrell down here can kind of speak about cask issues and possible, potential failure mechanisms.

MR. DUNN: Okay, so, if we're talking about a welded stainless-steel canister, which is the majority of the systems that we have in use at ISFSI sites here in the U.S., those canisters, there only plausible mechanism for failure is chloride induced stress corrosion cracking. And that's a very long process that takes, it's a slow process.

It takes many years to develop that environment for the canister to cool. And the crack propagation rate, once the environment can actually form, are pretty slow. So the time frame for that failure to occur is decades.

Given that we have the requirement for aging management programs for these systems once they go through a renewal, and for any system we've approved thus far, that's after 20 years, those inspection programs are typically five to ten year frequency. So that's more than adequate to detect the localized corrosion and stress corrosion cracking process prior to the failure of a canister.

MR. KEEGAN: Are you counting on leaking before breaking, is that --

MR. DUNN: Oh, it will definitely leak before --

MR. KEEGAN: How do you --

MR. DUNN: It will definitely leak before it breaks.

MR. KEEGAN: How do you inspect a welded cask? If its welded shut, how do you inspect it?

MR. DUNN: So the inspection systems for welded canisters are described in the, either the license of the COC, aging management program. They're typically done by remote inspection methods.

MR. KEEGAN: What are plans for mitigation of an accident if one occurred? And how long would it take for the mitigation to occur?

MR. DUNN: So, if there is a issue with any type of spent fuel storage system where there is an aging effect that could potentially affect a safety related function of that system, then that is put into the licensee's corrective actions program. And they have a process to deal with those types of issues.

MR. KEEGAN: But once it fails, what is your mitigation plan once it fails?

MR. DUNN: So the corrective action

program is designed to preclude failure. So there would be a actions taken before the canister lost a safety significant function, such as confinement, to prevent that from happening.

MR. KEEGAN: Okay. Well let me just comment that I'm appalled that the Agency is torn between keeping the same amount of inspection in place, which is nil or none, and reducing it.

I mean, the NRC soon will be a data free zone. I mean, the consequences of a Class 1 event are catastrophic. Beyond, I mean, a catechism.

And yet you're going to go years without inspecting these? Inspect maybe one of a whole lot. Inspect one at a sister plant somewhere else or if it's a similar cask.

You are actively engaging in a methodology that is going to bring about criminal negligence. You are aiding and abating a criminally negligent situation.

I would alter to the no vote standards and principles, and you are conveying crimes against humanity and future generations. You should be doing additional inspections, not less inspections.

So those are my comments. And we just have scratched the surface. I thank you.

MR. DAVIS: This is Marlone Davis, I'm a senior safety inspector for storage and transportation.

I just want to also add to Darrell Dunn's reply. There is continuous monitoring that goes along in-between those inspections.

So we do monitor on a daily basis, any releases that come from those ISFSI sites. So I just want to just provide that perspective also that there is continuous monitoring.

MS. KOCK: This is Andrea Kock. Just one additional piece of information.

The NRC has an event response program in place as part of our oversight program. And if there is an event at any of our facilities we also have the ability to respond immediately.

The event response program is not one that we change. Or that are in proposed changes being made as a result of the working groups effort.

MR. TAPP: The only, this is Jeremy Tapp again, the only thing I will clarify is to make sure it's clear, is that for the routine inspections that are performed, it's at each site. This is not just one site and then we just choose everyone.

So, each site inspected on this frequency,

we're not using companies that have multiple sites. We're not just inspecting one of those multiple sites over this frequency, it's every site at this frequency.

Okay, next question. Anything else on the line?

THE OPERATOR: Great. It looks like the next question is from Ms. Diane. Your line is now open.

MS. D'ARRIGO: Hi. Diane D'Arrigo, nuclear information and resource service. Following up from the previous conversation, I know you mentioned the aging management program and another, a few other programs that deal with various issues as they come up, and you have a very specific focus on the ISFSIs.

Having dealt with the long-term management program it's pretty vague. So, with regards to having radioactive wastes at sites in the longer term, 40, 60, 100, 200 years, even if the canisters are super new, there is going to be a point where they need to be, the materials need to be re-containerized.

So, what is the plan for that? Or is that completely going to be left up to future generations to deal with?

I mean, if the fuel pools are gone, have you looked at the possibility of remote handled dry cells, or how you would do the kind of Russian Doll thing that I've heard some companies talk about.

MR. DUNN: Okay, this is Darrell Dunn again. So, I think there is some confusion about the continued storage of rulemaking that was done. In that rulemaking there was an assumption made that the ISFSIs would be essentially completely replaced and the fuel reloaded into new canisters, approximately every 100 years.

But that document also states that there is really, may never need to be a reason to do that. That was done in that environmental impact statement to account for the environmental impacts of that needing to occur.

We have not required the construction or operation or design for a dry transfer facility. There is, at present, no need to have anything like that at any operating ISFSI in the U.S.

The Russian Doll concept that people refer to, there actually have been systems that have, or at least one that I know of, that has been built. It is on an ISFSI site. It will likely never be used, but it was a requirement by the state, it was not a

requirement by the NRC.

It is a possibility, if there was ever a need to have some type of mitigation, that is a potential possibility that could be used for either that system or for other systems. But at the present time there is no need or no requirement by the NRC to have those things available.

MS. D'ARRIGO: Well, you heard what I said, I wasn't talking about the present time, I was talking about 40, 60, 100, 200 years. And so the question is, do we just let the question then deal with the issue if and when it happens rather than planning for it at this point?

I know in the, well, I'll let you answer that. Go ahead.

MR. DUNN: Well, it's certainly going to have to be someone who's going to be responsible for that ISFSI at that time, which is going to be the owner of that fuel, at that location.

And they will have to have staff available to continue to do the aging management programs, to identify the needs, if there are any, for any corrective action that would take place. Either a mitigation process or if, in the extreme case, some other type of mitigation action to repair or mitigate

a damaged canister.

MS. D'ARRIGO: But they don't have to make arrangements for it now as part of getting a license for now?

MR. DUNN: No. What they have to have now is a corrective action program that has the capability to deal with problems as they come up.

MS. D'ARRIGO: And financially, how is that funded?

You're assuming that down the pike whoever owns it can afford it? Is that the assumption?

MS. KOCK: Let me try. This is Andrea Kock. So, as part of a decommissioning funding plan that power reactors have for decommission funds, part of that is, are set aside for management of spent fuels. We do require licensees to have funding to manage the spent fuel.

If you need more information about all of the assumptions that go into that, we'll have to get you one of our financial experts.

MS. D'ARRIGO: Who would that be? Yes, we're interested in how it's going to be funded.

MS. KOCK: We can do a takeaway on that and if you want to put your email address in the comments on the Skype, we can have one of our

financial experts get back to you.

MS. D'ARRIGO: I wasn't able to access my computer at work, so I'm on the phone and I'm using the slides that were provided. So I just email somebody?

MS. KOCK: Sure. You can email Jeremy Tapp.

MR. TAPP: Yes. I have your email from our, we've had a few emails back and forth I believe, so.

MS. D'ARRIGO: Yes.

MR. TAPP: Yes, so you can send that --

MS. D'ARRIGO: Okay. So you can go ahead and send me who can answer the economic questions then?

MS. KOCK: Sure. Yes, we can do that, Diane.

MS. D'ARRIGO: Thank you.

MR. TAPP: Okay, any other questions on the bridge line?

THE OPERATOR: Actually, no further questions on the phone line at this time.

MR. TAPP: Okay, thank you. We do have some questions on Skype, so I'll get to those. I'll go ahead and read them for those on the phone.

This question is from Andrea Jennetta. I hopefully I get your name pronunciation correct.

The question is, Jeremy said inspection hours would increase by 18 percent. Is that for pre-operational activities at new ISFSIs?

And the answer to that is correct. Yes for new ISFSIs. And also, it would be increased for those sites that may decide to switch designs in the future to one that's not already loaded at that site.

And so here, by what one percent will inspection hours decrease for existing ISFSIs and routine loading campaigns. So for the existing ISFSIs and loading campaigns, the estimate is approximately around that same value, around that 18 to 20 percent decrease.

In the initial working group report, it was a footnote stating that there was conservative assumptions made for the total hours for inspection.

And so I think that the number there that was being looked at was around the 46 percent decrease. But using a more realistic number of actual inspections performed and the level of effort in frequency, it came out to more around the 18 to 20 percent decrease.

And one thing just to point out and keep

in mind is that it's a relatively small program. So any changes might have a relatively large impact on the percentage of reduction. So I just want to make sure that's clear as well.

Anything else to add to that or, okay.

This next question comes from Anthony. And I'm going to butcher your last name, Leshinskie.

Can you summarize key changes for an ISFSI pad already fully loaded with fuel? Many of the changes appear to be focused on ISFSI construction and fuel loading oversight.

So, for the routine monitoring inspections, there was no changes to the scope of the inspection, those will stay the same. As well as for the away from reactor facilities where there is no loadings occurring.

The only small change is in the inspection frequency which could, before was, every two years, not to exceed three years. And currently moving to a triennial frequency for those inspections.

Another question from Anthony. Since this effort is recommending an increase in inspections during ISFSI construction, do you expect to require any supplemental inspections for ISFSIs that have recently completed construction and have just started

storage operations?

So, the increase for those inspections were more to bring in line the estimated resources to what the actual expenditure was in the past. Many times, due to the high number of risk-significant activities needed to be performed for pre-operational testing and for the 10 CFR 72.212 evaluations, the inspection teams would expend more than the average or the estimated number of hours from the current inspection program.

So, a lot of that was actually bringing the estimations in line with what has typically been seen over the past number of years, what is necessary to ensure that the licensee is ready to load during those pre-operational inspections.

Also, it focuses the changes in the level of effort really are to focus on those risk-significant activities moving forward and what the actual hours we believe are required to ensure an adequate program moving forward.

Question from Jack Desando, from Exelon. It says, Slide 11 addresses routine inspections and shows a reduction of hours from 132 to 96 hours every three. It also implies that this reduction will be accomplished by a focused on risk-significant

inspection activities.

Will risk be informed by operating experience?

As an example, the slide shows welding as risk-significant, and based on your experience with your cask welding programs, would you still consider this as risk-significant?

So yes. When performing the inspection we always use both risk and also operating experience or a performance-based inspection.

So if there had been times in the past or it's been a good program or an adequate program that the NRC has reviewed in the past, that would definitely inform our inspection effort on risk-significant activities moving forward.

We want to make sure we do put our eyes on those risk-significant activities, but we take, yes, operating experience and previous history and current performance into account when performing that inspection activity.

MS. KOCK: I think he was asking about welding, is it risk-significant.

MR. TAPP: Right. So, would you still consider it, this as a risk-significant. So, the welding operation is considered risk-significant since

it provides the confinement moving forward for passive storage for the duration. So, yes, we would still consider this a risk-significant activity.

The amount of inspection effort would be, again, like I said, based on operating experience and performance by each licensee.

So we're not going to say it was going to be this exact amount hours at every facility, there is flexibility built in for each inspection that's performed based on each licensee's past performance and current operating history. And experience.

I have another question from Andrea. Can you provide a brief explanation of what 10 CFR 72.212 requires utilities to do? So, in ISFSIs there is a general license that's given to all nuclear operating reactor licensees.

And this general license is able to be used after the performance of the 10 CFR 72.212 evaluation. And in demonstration through dry runs as part of the certificate of compliance that they're ready to load.

And that regulation in 10 CFR 72.212, there is a number of activities and evaluations the licensee has to perform. And mainly it's to determine the reactor site parameters are bounded by the general

license, sorry, by the certificate of compliance for the cask design they choose to load.

And really what that means is that they want to make sure, because the cask systems are approved for general use.

You're not taking into account specific criteria from the reactor site, such as the earthquake parameters, external events like tornado, wind, loadings. Those sorts of things play into how safe is the cask design at your specific reactor.

So what those licensees have to do is evaluate and make sure that they are bounded by the evaluation performed by the cask vendor to say that, yes, this will be safe at our site because the earthquake that they evaluated is greater than the one at our site. It will be bounded and showed that it will be safe.

I hope that is a brief enough explanation for that.

Another piece of that, that I'll just mention, is that they have to also review their operating reactor programmatic areas. Such as quality assurance, emergency preparedness, radiation protection, to ensure that those programs now encompass ISFSI operations and activities so that they

adequately perform in ISFSI operations under all the programs that are used to control it to ensure safe operations and storage.

Okay, I don't see any more questions right now on Skype. Is there any additional questions on the phone line?

THE OPERATOR: There is one.

MR. TAPP: Go ahead.

THE OPERATOR: It looks like the name is Kaylene Walker. Your line is now open.

MS. WALKER: Hello. Good morning. Can you hear me?

MR. TAPP: Yes.

MS. WALKER: Okay, great. Let's see, I feel that fuel damage is in the purview of this recommendation. I'm wondering, what is the method of inspecting fuel before it gets canisterized?

Is there dipping method or cameras or you just go on the data from when it comes out of the plant or what's the process?

MR. DAVIS: Ms. Walker, this is Marlone Davis. I'm a senior storage transportation safety inspector.

So, as required in our inspection procedures, the inspectors are required to take a look

at how the licensee determine to load fuel into the canister. That could mean many ways in inspecting that fuel before it's entered into the canister.

It could be a simple visual, it could be a ultrasonic test, that they would do a UT, normally what we call it. But they're supposed to videotape or record all of the inspection activities prior to placing those particular fuel assemblies in the canister.

So there is a number of methods that they can use in order to perform that inspection. Which we don't specifically require one over the other, it just depends on what the licensee deemed appropriate in order to make sure that they don't have any damaged fuel or any fuel leakers prior to that being loaded into the canister.

And if so, they're required to load those particular, if they do identify fuel leakers or damaged fuels, into damaged fuel cans. So hopefully that would answer your questions as there are a number of methods that they can use in order to inspect prior to entering the canister.

MS. WALKER: Now, once the canister is loaded, you don't really have a method of determining whether fuel might become damaged once it's in the

container, correct?

MR. DAVIS: That is correct.

MS. WALKER: And so, one indicator would be temperature, is that correct? If there is damaged fuel there could be a temperature increase inside the canister?

MR. DAVIS: Right. It really could be multiple things. It could be a change in pressure. It could be temperature, it can be a dose around the area that might show up.

But again, there is just not one particular thing that we look at. We analyze for a lot of things. And that was one of the reasons why we decided to acquire it in an inert environment. So it would stay dry, stay clean in order to maintain the fuel integrity of the fuel.

MS. WALKER: There is potential hydride issues inside all of that. And we also know that canisters, or at least one canister, I can't remember what site it was, Arkansas perhaps, where a canister was loaded with damaged fuel and then the NRC just decided to let it be, they worry about it later. So that worry about it later concept is still a concern to me.

Being a local, the San Onofre, we had the

near drop incident. Which only came to the public's attention because of a whistleblower. Because of that, there was a special inspection of some of the canisters, of the ISFSI.

And they supposedly inspected some canisters. Eight I think. And during that inspection, which was not a real inspection because you can't inspect the canisters for developing cracks, I have a problem with your whole concept of inspection.

But in any case, they did determine that the metal-to-metal contact, with a carbon steel diagram, caused carbon particles to be embedded into the canister walls. And this quite possibly introduces new corrosion sites and new corrosion mechanisms.

And the NRC kind of overlooked that and said, oh, that's okay, this Holtec loading system, that's okay, we'll worry about that later maybe. But, so we had no way to really inspect those canisters over time to see what that corrosion site, with the corrosion sites. Which they were on almost all of the canisters that were inspected.

So this is extremely concerning to me. Let' see, the public exposure is part of your purview.

We have continual radiation release from out of the air vents from these canisters, is that correct?

MR. TAPP: There is, sorry, this is Jeremy Tapp. From a radiation standpoint these are welded canister designs so there is no particulate radioactive material being released from the vents.

There is some, what we call direct radiation. Those in the form of, that can go through material. Which is very low and would not have any appreciable offsite dose to any member of the public.

And the licensee has to evaluate to ensure that the ISFSI does not, or meets the requirements in Part 72 for offsite dose. For the public limits.

MS. WALKER: Well, again, at San Onofre, we have the 15-year-old Areva canisters, or their over 15 years old, many of them now. And we have not been given the outter vents.

We've been given the inner vent radiation readings. And they vary greatly. And there is ionizing radiation being emitted from the vents. And we're not given the information for the outlet air vents, which would presumably be higher.

This is accumulative release into the atmosphere from every canister. And I think that this should be accumulative of, what do they call it,

source point radiation release that the public should be aware of.

And it feels a little bit, we'll say non-transparent. Previous not to be continually monitored and made public, to be made available to the public.

So that was another extreme concern. I just feel like your recommendations are basically time spent by the NRC on this new industry. You're just beginning to allow these canisters to be loaded.

There is three, over 3,000 of these canisters that according to the senior inspector, who reviewed the inspection method of Holtec and Edison after this near drop incident stated, it is impossible to inspect these canisters according to any kind of ASME code.

And so, I don't know what your intention is. But believe me, the public is extremely concerned and skeptical of the NRC's ability to handle this technology.

And I think you should be reviewing what the defense-in-depth is and what your system of dealing with the canister failure is. It would take probably decades to get a hot cell fuel handling facility built.

And once it happens, you're going to need

it. So, I throw up my hands, say thank you.

MR. TAPP: Okay.

MR. DAVIS: I just want to thank you for those comments. I do want to emphasize that both the NUHOMS design and the UMAX Holtec design, that is, at Songs, is continuously monitored through radiation surveillance that they conduct on a periodic basis.

So I just want to make sure that's clear. That --

MS. WALKER: Intermittent, intermittent, intermittent is different than continual. This is still continual release. And if there were a spike, we would want to know immediately.

Why is there no temperature requirement of these canisters? If there were a temperature increase that would indicate some kind of, something is happening.

And we do harbor enough fuel, these canisters are a new design. Thirty years is not a mature industry. In this forever industry. Thirty years is nothing. Thirty years is about when problems will start to arise.

It should be carefully monitored. Intensive care oversight. I think you're moving in the wrong direction with this recommendation.

MS. KOCK: So, this is Andrea Kock. Just a couple of things to step back, big picture. One is, a lot of the things that you're talking about relate to how we monitor potential aging of these canisters once fuel is loaded into a canister.

This working group is not recommending any changes to the aging management programs that are in place.

I think as Jeremy mentioned at the beginning, that's one of the things that was not evaluated by the working group so we're not recommending any changes to those programs, which will continue.

And then just to put into perspective, radiation dose. So our public dose limit for a member of the public that is offsite from a facility, our annual limit is 100 millirem.

And all of our licensees have to demonstrate that any radiation release from their facility would not expose somebody over 100 millirem.

And just to put that into context for somebody. The average person living in our country, this is based on exposure for medical procedures and building materials, receives about 600 millirem a year. So I'm just trying to put in context for you

our limit for public exposure and how that relates to how people are exposed to natural radiation every day.

MS. WALKER: Radiation causes cancer, leukemias. How many people do you know, I know a lot of people with cancers and leukemia, tons of cancers.

There is a lot of background radiation that we cannot determine the source of. And these instances are a huge potential source of radiation and hazard to the public.

This is extremely concerning. This is an extremely serious responsibility that you have, and I think you're moving in the wrong direction.

MR. TAPP: Thank you for your comments, I appreciate it. All right, any other questions on the line?

THE OPERATOR: There is one more question from Diane. Your line is now open.

MS. D'ARRIGO: Hi, this is Diane D'Arrigo again. I was a few minutes late onto the call. Could you tell me who was on the working group that developed this and do you have any public interests, concerns, members of the, and people who are members of the public not in the industry or the regulators that participated in it?

MR. TAPP: The working group was comprised

of ISFSI inspectors from the four regional offices, from the NRC, that performed these inspections. As well as a reactor resident inspector and members from NRC headquarters from both the reactor area and the ISFSI area. So it was an NRC working group. Does that answer your question?

MS. D'ARRIGO: Yes. So, as a member of the public, is this the, I guess the concern I have is the segmentation and that there are time frames and locations that are not considered, that you're able to only look at a specific piece of managing the ways for set time periods.

You don't know how it's going to be paid for, but you're going to connect me with someone who supposedly knows. And we don't have the capability to do re-containerization.

I guess I would ask, what is the one site that was able to do the Russian Doll thing? One of your staff mentioned it.

Could you tell me more about that because I had not heard that that was actually a physically possibility, and it would be encouraging to hear how that actually was capable of happening.

MR. DUNN: So, the ISFSI at the Main Yankee has a canister overpack. It is sitting inside

of their storage building, right next to the ISFSI. Again, that was a requirement by the State of Maine, it was not a requirement by the NRC.

The systems that, a couple of different canisters have been inspected at Maine Yankee. One greater than Class C waste canister, one canister loaded with spent fuel. Those canisters are pristine.

There is no indication of any degradation of those canisters at all. Even though the spent fuel canister was loaded in 2002.

So, the canister overpack that's sitting in their shed, next to their ISFSI, is probably going to sit in their shed next to the ISFSI until the canisters are moved offsite to wherever they go. And that system will be scrapped.

MS. D'ARRIGO: Oh, so you're just saying it's a building over the containers, you're not talking about a specific canister --

MR. DUNN: No, no, no. It is a canister that is designed to be a canister overpack. So the canister would be removed from the concrete overpack that provides the shielding, it would be, the canister would be put into a transfer cask.

The canister overpack would be inserted into the concrete overpack and then the canister would

be placed inside of that canister overpack. And that canister overpack would be closed and backfilled with helium. And then the lid of the shielding, the concrete shielding overpack would be reinstalled.

MS. D'ARRIGO: So, it would actually have to be removed from its existing outer shielding?

MR. DUNN: Into a transfer cask, yes. The transfer cask --

MS. D'ARRIGO: And that can be done --

MR. DUNN: The transfer cask provides shielding during that operation, that's how they're transferred into the shield overpack to begin with.

MS. D'ARRIGO: And who am I speaking with on this?

MR. DUNN: This is Darrell Dunn.

MS. D'ARRIGO: Thank you, Darrell.

MS. KOCK: And Diane, this is Andrea Kock, just to clarify one thing on the funding, and we will connect you with one of our decommissioning funding experts.

I wouldn't say we don't know how spent fuel funding is managed. We do require that our licensees have funding for spent fuel management. But we'll connect you with one of our experts who can tell you about the assumptions and the details of that.

MS. D'ARRIGO: Thank you.

THE OPERATOR: I'm showing no further questions at this time.

MR. TAPP: Okay, thank you. We do have an additional question the Skype. This is from Anthony again.

Please expand briefly on partial qualification of inspector's recommendation. If I'm understanding it correctly, a resident site inspector or site decommissioning inspector will now conduct the required three year storage inspection, and would a fully qualified ISFSI inspector review a resident or decommissioning inspectors' findings and follow up with a more detailed inspection if the ISFSI inspector had questions?

So, just to clarify that the recommendation is for any inspector who performs inspections would be a qualified ISFSI inspector. The resident inspector at an operating reactor, if determined by their regional office that they want residents to perform certain inspections of ISFSI, be it either the routine loading inspection or even pre-operational inspection, the recommendation is that they would need to go through either the full cross-qualification program or the partial cross-

qualification program, depending on their scope of inspection activities.

But I think the main question here is that they would be doing it without the existing quals, and that's not the case. That the recommendation is not to do it without ISFSI quals. I hope that answers the question.

Okay, I have another question, from Jack Desando. You're welcome, Anthony.

All right. And this is a question from Jack Desando. Can you elaborate on reduction and inspection program overlap between Part 50 and Part 72 inspections?

Specifically, some aspects of the program are included in the inspection procedures for the reactor oversight. So, in the current ISFSI inspection program for those, you know, mainly for those co-located operating reactors but for all ISFSI inspections, there is requirements to review the overall programmatic aspects of areas like emergency preparedness, problem identification resolution, radiation protection.

And so, for these areas the reduction and overlap, or scope, is that we don't want to review the adequacy of these overall operating reactor programs,

which are, as you know, already assessed under the ROP, or for decommissioning site assessed by decommissioning inspectors.

So the working group put together a recommendation to reduce that overlap by focusing the ISFSI inspections only on the ISFSI aspects of those programs. So that's really where the overlap was. I hope that answers your question as well.

All right, very good. One last call to see if anyone on the bridge line?

THE OPERATOR: Actually, no questions on the phone line.

MR. TAPP: Okay. Any additional on the Skype? We'll give it a second. Okay, very good.

Well, I appreciate everybody's attendance today and I hope we were able to provide some information to everyone to understand what our proposed recommendations are moving forward. And thank you very much for participating.

THE OPERATOR: This concludes today's conference. All participants may disconnect at this time.

(Whereupon, the above-entitled matter went off the record at 2:15 p.m.)