

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
Regulatory Policies and Practices

Docket Number: (n/a)

Location: teleconference

Date: Tuesday, November 16, 2021

Work Order No.: NRC-1750

Pages 1-46

NEAL R. GROSS AND CO., INC.
Court Reporters and Transcribers
1716 14th Street, N.W., Suite 200
Washington, D.C. 20009
(202) 234-4433

DISCLAIMER

UNITED STATES NUCLEAR REGULATORY COMMISSION'S
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

The contents of this transcript of the proceeding of the United States Nuclear Regulatory Commission Advisory Committee on Reactor Safeguards, as reported herein, is a record of the discussions recorded at the meeting.

This transcript has not been reviewed, corrected, and edited, and it may contain inaccuracies.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS

1323 RHODE ISLAND AVE., N.W.

WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

3 + + + + +

4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

5 (ACRS)

6 + + + + +

7 REGULATORY POLICIES AND PRACTICES SUBCOMMITTEE

8 + + + + +

9 TUESDAY

10 NOVEMBER 16, 2021

11 + + + + +

12 The Subcommittee met via Video
13 Teleconference, at 2:00 p.m. EST, Ron Ballinger,
14 Chairman, presiding.

15 COMMITTEE MEMBERS:

16 MATTHEW W. SUNSERI, Member

17 RONALD G. BALLINGER, Member

18 VICKI BIER, Member

19 CHARLES H. BROWN, JR. Member

20 VESNA B. DIMITRIJEVIC, Member

21 GREG HALNON, Member

22 JOSE MARCH-LEUBA, Member

23 DAVID PETTI, Member

24 JOY L. REMPE, Member

25

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 ACRS CONSULTANT:

2 STEVE SCHULTZ

3

4 DESIGNATED FEDERAL OFFICIAL:

5 HOWARD KENT

6

7 ALSO PRESENT:

8 STANLEY GARDOCKI, RES

9 STEVEN JONES, NRR

10 SCOTT MOORE, Executive Director, ACRS

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

P R O C E E D I N G S

2:00 p.m.

CHAIR SUNSERI: Good afternoon everyone.
It is 2 p.m. Eastern Time. The meeting will now come
to order.

My name is Matthew Sunseri, and I am the
subcommittee chair for the Regulatory Policies and
Practices Subcommittee meeting for today.

I'll just call down the roll here from
what I see, and then check that we have a quorum.

But anyway, I see Ron Ballinger, Vicki
Bier, Dennis Bley, Vesna Dimitrijevic, Greg Halnon,
Jose March-Leuba, Dave Petti, Joy Rempe, myself, and
our consultant is with us today also, Steve Schultz.

Did I miss any members?

(No audible response.)

CHAIR SUNSERI: Okay. The purpose of this
is a information briefing today, is for the NRC staff
to brief the subcommittee on Draft Guide 1381, which
will be Reg Guide 1.244, titled Control of Heavy Loads
at Nuclear Facilities.

Mr. Kent Howard, of the ACRS staff is our
designated fellow officer for this meeting.

During today's meeting, the subcommittee
will gather information and analyze relevant issues

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 and facts, and familiar proposed positions and actions
2 as appropriate.

3 However, at this subcommittee's
4 discretion, any matter will be considered for
5 presentation at the full committee, if necessary and
6 if members see fit.

7 However, I will note that as I mentioned,
8 this is an information briefing, and I'm not really
9 anticipating writing a letter at this time based on
10 the review that I've done, and the information that
11 we've seen from the staff already. But anyway, we'll
12 see what the committee feels at the end.

13 The ACRS was established by statute as
14 governed by the Federal Advisory Committee Act. The
15 committee only speaks through its published letter
16 reports.

17 Because this is a subcommittee meeting,
18 persons should consider any remarks by ACRS members as
19 their personal comments, and not committee positions.

20 We hold subcommittee meetings to gather
21 information and perform preparatory work that will
22 report our deliberations at full committee meetings,
23 if necessary.

24 The rules for participation in all ACRS
25 meetings including today's, were announced previously

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 in the Federal Register notice and included on our
2 website.

3 The ACRS section of the U.S. NRC public
4 website provides our charter, bylaws, agendas, letter
5 reports, and transcripts of all full and subcommittee
6 meetings, including presented material.

7 As stated on the website, members of the
8 public who desire to provide a written or oral input
9 to the subcommittee may do so, and should contact the
10 designated federal officer five days prior to the
11 meeting, as practical.

12 Today's meeting is open to the public
13 attendance, and there will be time set aside during
14 the meeting for comments from members of the public
15 attending, or listening.

16 Due to the Covid pandemic, today's meeting
17 is being held over Microsoft Teams for ACRS and NRC
18 attendees. There is also a call-in number allowing
19 participants of the public to connect to the Teams
20 session.

21 A transcript of the meeting is being kept.
22 Therefore, we request that meeting participants not on
23 the agenda identify themselves when they are asked to
24 speak, and speak with sufficient clarity and volume so
25 they can readily be heard.

1 At this time, I ask attendees to put their
2 devices on mute to minimize disruptions, and only
3 unmute when speaking.

4 So, before we get into the meat of today,
5 I'll just call on the members. Members, any questions
6 about the agenda for today, or any comments you want
7 to make before we get started?

8 (No audible response.)

9 CHAIR SUNSERI: All right, we will now
10 proceed with the meeting, and I call on Mr. Steve
11 Jones, Acting Branch Chief of Containment and Plant
12 Systems Branch, the Division of Reactor Regulation, to
13 make any introductory remarks.

14 Mr. Jones, go ahead. You have the floor.

15 MR. JONES: Thank you, Chairman.

16 Good afternoon, my name is Steven Jones,
17 I'm currently serving as Acting Chief of the
18 Containment Plant Systems Branch in the Division of
19 Safety Systems, Office of Nuclear Reactor Regulation.

20 I'm here to brief the subcommittee on the
21 Draft Final Regulatory Guide 1.244, addressing control
22 of heavy loads at nuclear facilities.

23 This guide was previously issued as DG-
24 1381 for public comment from, approximately from May
25 through July.

1 The Reg Guide is intended to provide
2 guidance for the design, operation, maintenance,
3 inspection, and testing of material handling equipment
4 used at nuclear facilities under circumstances where
5 handling errors could threaten the satisfactory
6 accomplishment of essential safety functions.

7 The agenda for this meeting includes
8 discussion of the change in the guidance as a result
9 of the Reg Guide, a brief discussion of safety
10 significance, a resolution of public comments
11 received, and a brief discussion of our, of the
12 staff's conclusions.

13 I'm happy to address questions at any
14 point in the presentation. And in addition, there are
15 several staff members available to address areas
16 linked to control of heavy loads, that may be outside
17 the scope of the, of this Reg Guide.

18 So, the intent of the issuance of Reg
19 Guide 1.244 was to adopt national consensus standards
20 where appropriate, to update guidance, and to expand
21 the scope to cover licensing under Parts 50, 52 and 72
22 of Title 10 of the Code of Federal Regulations.

23 Part 50 is the traditional licensing
24 approach for operating nuclear reactors, and certain
25 utilization facilities.

1 Part 52 for the newer design reactors and
2 alternative licensing approach, and Part 72 covers the
3 licensing of independent spent fuel storage
4 installations.

5 These parts all include similar
6 requirements to provide appropriate protection from
7 the effects of equipment failures, and natural
8 phenomena, and thereby provide reasonable assurance
9 that essential safety functions would be accomplished.

10 These parts also include requirements to
11 describe normal operations, including maintenance and
12 testing of equipment important to safety.

13 First, I'll touch on the existing
14 guidelines.

15 Control of heavy load movement has been
16 part of the nuclear reactor licensing bases since the
17 1970s. And, through a generic letter issued in 1980,
18 the staff requested all licensees and applicants to
19 address conformance with the guidance in NUREG-0612.

20 NUREG-0612 invoked several secondary
21 standards governing design, operation, and maintenance
22 of heavy load handling equipment.

23 But only NUREG-0554, which was single
24 failure proof cranes for nuclear power plants, and
25 ANSI N14.6, which covered, or which addressed the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 design of special lifting devices for shipping
2 containers, applied to the design of important to
3 safety structure systems and components.

4 NUREG-0612 specifically provided
5 guidelines for safe handling of loads in areas where
6 the effects of a handling accident could threaten the
7 accomplishment of essential safety functions.

8 Particularly, this included areas around
9 the reactor vessel and spent fuel pool, where direct
10 damage to fuel, or damage that causes a loss of
11 cooling water from either the reactor vessel or spent
12 fuel pool, could result in a release of radioactive
13 material.

14 The NUREG-0612 guidelines also included
15 good industrial load handling practices as a defense
16 and def measure. Those included provisions from
17 typical industrial standards, such as ASME B30.2,
18 which covers the design and operation of overhead
19 crane -- and I'm sorry, and ASME B30.9 for slings.
20 For use of slings with heavy load handling equipment.

21 The NUREG-0554 guidelines provided
22 somewhat detailed guidance for the design of single
23 failure proof for what I'll term in this meeting,
24 enhanced reliability handling systems, for overhead
25 cranes that provide means to compensate for equipment

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 failures, and withstand the effects of seismic events
2 while still being able to stop and hold the load.

3 The ANSI N14.6 standard provides design
4 testing and provisions for periodic demonstration of
5 continued compliance with those design measures for
6 permanent, special lifting devices that generally
7 provide a rigid connection between frequently handled
8 loads, and the crane load block.

9 Reg Guide 1.244 is proposed to endorse the
10 three ASME standards at ASME NML-1, Rules for the
11 Movement of Loads Using Overhead Handling Equipment in
12 Nuclear Facilities, provides the overall general
13 guidance for a heavy load handling program.

14 An appendix to NML-1 provides a comparison
15 of the guidelines in that standard with NUREG-0612.

16 It also uses a risk informed approach
17 considering qualitative risk insights related to the
18 type of lift, and the surroundings.

19 Its scope is somewhat broader than NUREG-
20 0612. It covers for instance, operations in the yard
21 of nuclear power plants, or operations related to
22 interim, I'm sorry, to independent spent fuel storage
23 installations.

24 And, it has also been updated to reflect
25 operating experience insights that have been

1 accumulated since, since the 1980s related to control
2 of heavy loads, especially with respect to below the
3 hook activities, such as problems with the sling usage
4 and basket, or choker configurations, and which is
5 described in ASME B30.9.

6 And, it also relaxes requirements related
7 to special lifting devices, which have demonstrated
8 very good performance over the last 40 years as part
9 of an overall handling system for repeated handling of
10 very large loads, such as reactor vessel heads, vessel
11 internals, or independent spent fuel storage
12 installation transfer casks, and loaded fuel
13 canisters.

14 MEMBER BROWN: Can I ask a question?

15 MR. JONES: Sure.

16 MEMBER BROWN: This is Charlie Brown.

17 MR. JONES: Uh huh.

18 MEMBER BROWN: I guess I'd like to have you
19 explain a little bit, what do we mean by a qualitative
20 risk inform approach for lifting stuff?

21 I thought cranes, their cables, the
22 slings, all had load requirements and testing
23 requirements you know, to at least make sure their
24 strength and characteristics exceeded those needed for
25 any particular load.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 How do you make that qualitative?

2 MR. JONES: You're correct, that the
3 standard provides for specific requirements for the
4 handling system, the crane, and also any slings or
5 special lifting devices associated with that. And, as
6 well as the load lifting attachments.

7 However, the standard provides for, excuse
8 me, a graded assessment of the risk associated with
9 the, excuse me, with the load movement. Specifically,
10 there are the first element of any lift approach is to
11 classify the lift per NML-1.

12 And, that involves assessing the antenna'd
13 rigging applications, as well as what's surrounding
14 the lift path, and identifying any, any important to
15 safety structures or components.

16 This Reg Guide is intended to apply
17 predominantly to what's classified as nuclear safety
18 critical lifts. And, that's where the damage from a
19 postulated handling system failure could result in the
20 loss of a safety function.

21 In other words, for example, direct
22 mechanical damage to the fuel, which would, could
23 cause a release of gaseous fission products within
24 the fuel. Or, as I mentioned earlier, loss of water
25 from the spent fuel pool, or the reactor vessel.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 A change in configuration of the fuel that
2 could affect criticality. Or, away from the vessel or
3 the spent fuel pool, damage to redundant trains of
4 safety related equipment that perform the same
5 function.

6 For example, if cooling water, service
7 water, provides essential cooling via two pipelines
8 that are independent but they happen to be close
9 enough together that a single load drop can, could
10 damage or interrupt flow in both, then that would be
11 one of the areas subject to classification as that
12 nuclear safety critical lift.

13 Other circumstances would be considered
14 less risky and may be subject, for example, under the
15 maintenance rule or seismic two-over-one criteria,
16 that are also somewhat discussed in NML-1, but really
17 kind of outside the scope of the NRC's regulation of
18 heavy loads as a consideration in the safety analysis
19 specifically. That's more risk management and
20 maintenance associated.

21 Does that address your question?

22 MEMBER BROWN: Well, the initial, the items
23 you listed initially sounded like pretty specific
24 requirements. There was nothing evaluative about it.
25 They either had to be clear, you know, you put a

1 checkmark by it or you don't.

2 MR. JONES: Well, I mean, I guess I wasn't
3 complete. There's several, I mean you can use lesser
4 quality cranes, or even a mobile crane, depending on
5 your assessment of the risk, and what you're around,
6 what is involved.

7 For example, a removal of an out-of-
8 service component where, and in the yard, where you
9 know, even if the mobile crane toppled and were to
10 strike other things, there would be no challenge to
11 any safety function. Then that would have essentially
12 the lowest grade of control under NML-1 provisions.
13 That's considered a normal lift.

14 Then there's a classification as a special
15 lift where the, this would be more likely to involve
16 movement of one train, effecting one train of a safety
17 system, where the maintenance rule requirements may be
18 coming into play.

19 And, a third category is critical lift.
20 And, this could involve, I mean the standard is
21 actually intended to encompass things beyond nuclear
22 power plants, including aerospace activities where
23 very high value components might be handled by the
24 crane, and might be deemed critical lifts.

25 But a subset of that is nuclear safety

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

critical lifts, which meet the criteria described earlier.

So, and that's the sense that there's a qualitative risk informed approach within the standard

And, so the types of handling systems, the qualification of the rigging components, and the degree of extra measures provided to protect those components from the effects of any load drop, all vary based on that load classification.

MEMBER BIER: If I can chime in for a minute, this is Vicki Bier.

I want to see if I'm understanding correctly, and if so, maybe it will help answer Charlie's question as well.

Charlie's comment was that the slings and cranes, and whatever else, have very concrete numerical criteria for strength, et cetera.

MR. JONES: Right.

MEMBER BIER: And, as I read it, the qualitative risk informed approach applies to what's under the cranes, not to the cranes.

And, my read of the word qualitative is kind of you don't need to do a PRA to decide how important this stuff is that's under the crane.

Is that a fair kind of shorthand summary?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

1 MR. JONES: Yes, but I'd like to qualify
2 that with there are differences in actually the types
3 of cranes that can be used under various
4 circumstances. And, also the degree of qualification.

5 Even if you use an overhead crane that,
6 you know, is similar to what might be considered you
7 know, single failure proof or enhanced reliability, or
8 enhanced safety crane.

9 NOG-1 actually has three types of cranes.
10 A type-3 is a standard industrial overhead crane.
11 Type-2 is seismically qualified to remain in place,
12 but not, not under load. So, addresses seismic two-
13 over-one concerns, for example.

14 And, then the type-1 crane is, has
15 redundant features, such that if certain components
16 were to fail, or not operate as designed, the crane
17 would still be able to hold the load and prevent it
18 from dropping. Or cause damage to either the load
19 itself, or external components.

20 So, is that a little more clear?

21 And, then under the hook, you're correct.
22 There's differences.

23 ASME B30.9 has you know, a single standard
24 for a certain lift. But if you're employing it with
25 a nuclear safety critical load, then the guidelines

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 call for either having redundant load paths of
2 equivalent capability, or a single load path with
3 twice the design factors that would be applied to a
4 normal handling evolution.

5 MEMBER BROWN: What --

6 (Simultaneous speaking.)

7 MR. JONES: Can the --

8 MEMBER BROWN: Go ahead, I'm sorry.

9 MR. JONES: The same applies to special
10 lifting devices as well.

11 MEMBER BROWN: They still sound pretty
12 specific, quantifiables. I understand you used it for
13 a different type of crane, but you said of one of
14 lesser qualification. That one I don't quite
15 understand how --

16 MR. JONES: Well --

17 MEMBER BROWN: -- a lesser qualification,
18 what that means.

19 You don't have to have a double carriage
20 on the slings? Or you don't have to have the same
21 testing to ensure that that load capacity is really
22 what it is because it hasn't changed since the last,
23 or been damaged in some period of time since it was
24 last used?

25 I'm just still struggling. It sounds to

1 me like it's pretty specific even now. That's where
2 I'm --

3 CHAIR SUNSERI: Charlie, this is Matt.
4 Maybe this helps. I'll try to simplify it quite a
5 bit.

6 MEMBER BROWN: No, I'm sorry to beat this
7 to death. I just wanted to have an understanding of
8 this area, that's all.

9 CHAIR SUNSERI: It's maybe to the point of
10 oversimplifying it here.

11 So, you know, the extreme, on one extreme
12 end is a highly nuclear safety consequential lift. If
13 it goes wrong, bad day, right? That's the highest end
14 of the spectrum.

15 And, so what he's saying is that he's got
16 this qualitative guidelines to assess when to apply
17 those standards, to have all the you know, nuclear
18 grade load dropping capability, no tipping, all that
19 stuff.

20 On the other end of the spectrum is what
21 I'll call a commercial lift. You could be lifting a
22 container in Walmart's parking lot and use that kind
23 of crane for that.

24 So, you know, the qualitative assessment
25 is there to help decide which crane is appropriate

1 based on the nuclear safety risks.

2 Did I say that simplified enough, Steve?
3 Is that close?

4 MR. JONES: Yes, that's very close.

5 I mean this standard's not meant to be, I
6 mean it is meant to cover a very large spectrum. And,
7 at the bottom end, you're basically just complying
8 with OSHA requirements for what would be done at any
9 industrial site using a crane to lift things,
10 components around people.

11 MEMBER BROWN: Okay.

12 MR. JONES: Does that help, Charlie?

13 MEMBER BROWN: Yes, I mean yes.

14 I understand the desire not to hammer
15 everything with the nuclear set of standards.
16 Obviously, that makes sense no matter what. I just
17 was trying to get a handle on what, what changes when
18 you do that, okay?

19 And, you've kind of captured the bottom,
20 the bottom feeder in when you're in the parking lot of
21 Walmart and want to lift up a shipping container.

22 MR. JONES: Right.

23 MEMBER BROWN: That certainly clarifies it.

24 Okay, thanks. I won't beat this one to
25 death anymore.

1 CHAIR SUNSERI: No, that's a good question.

2 Go ahead, Steve. Continue on.

3 MR. JONES: All right, I'll move on to the
4 next two standards.

5 ASME NOG-1, the Reg Guide is endorsing the
6 2020 version of this standard. By the way, going
7 back, ASME NML-1 was new for 2019, so that's the
8 reason that this Reg Guide is essentially being
9 produced. Or being considered for issuance at this
10 time, because that's what allowed us to replace the
11 old technical guidance in NUREG-0612.

12 And, then so this standard addresses
13 specifically, a specific type of overhead crane that
14 uses a wire rope hoist and redundant girders that
15 carry a trolley, you know, over a fixed span usually
16 within a building, without the walls of the building
17 structure supporting the crane.

18 But it could also be a gantry, or semi-
19 gantry crane where the crane itself runs on tracks at
20 ground level on one or both sides.

21 The main factor here is to address the new
22 technologies that have been incorporated into these
23 types of overhead cranes, especially related to the
24 drive systems and the brakes, or the means of slowing
25 the load during lowering evolutions.

1 There used to be a commonly, a mechanical
2 load brake, and they would just use a DC-type of motor
3 for the hoist.

4 Now, there's a variable frequency, AC
5 motor drives, that can literally do what they call
6 float the load, where it adjusts the field strength of
7 the motor to just hold the load in position without
8 engaging any brakes.

9 And, it also can use electrical components
10 to basically dissipate the heat of lowering the energy
11 from lowering the load, through a resistor bank, and
12 use that as a controlled braking means during
13 lowering, which were not really addressed in NUREG-
14 0554.

15 In addition, it provides a great deal more
16 detail with regard to the design of the single failure
17 proof, or enhanced safety cranes.

18 All the recent cranes, or I'm sorry,
19 design certifications involving for example AP1000,
20 have cited this standard, an earlier version of this
21 standard, for those cranes.

22 And, then the final standard is ASME BTH-1
23 2017. It's designed for both as it says here, design
24 of below the hook lifting devices.

25 And, specifically, we're looking at

1 chapters 1 through 3, which address static mechanical
2 devices that directly support the load.

3 There are some provisions in that standard
4 for example, with magnetic hoists, or magnetic devices
5 and other features that might be used in other lifting
6 applications.

7 So, our intent here is to only accept
8 mechanical lifting devices that directly connect to
9 the loads.

10 The provisions of ANSE N14.6 that direct
11 with continued compliance, are covered in NML-1 as far
12 as you know, periodically verifying that the special
13 lifting device, which is really just typically a steel
14 structure, that the welds are not developing cracks,
15 that the dimensions of the lifting device are not
16 changing.

17 That's encompassed in NML-1 now, instead
18 of in use of ANSI N14.6, which was no longer, which
19 has been withdrawn and was really no longer getting
20 support for upgrades.

21 The effect of this new guidelines is to
22 really recognize that as I mentioned before, the
23 changes in technology and the lessons learned from
24 decades of operating experience under the previous
25 guidelines.

1 One of the big factors, or big changes, is
2 to administratively restrict sling usage to either
3 straight connections between specially designed
4 attachment points, or use of basket configurations
5 only around large diameter round objects, for nuclear
6 safety critical lifts, that highest, or most
7 concerning category of lifts.

8 That's really based on operating
9 experience that was, did not involve nuclear safety
10 critical lifts, but where objects were supported by
11 slings wrapped around the object.

12 And, a corner of that component was able
13 to cut through the sling material when the corner
14 protection devices that were placed by riggers, moved
15 out of position.

16 So, that really isn't meeting the intent
17 of an enhanced safety lift. So, we're trying to start
18 from the basic design where that protection against
19 cutting is inherent in the rigging design.

20 And, then beyond that, having additional
21 safety factors either provided through a redundant
22 rigging, or enhanced safety factors in the single
23 rigging path.

24 We've also recognized like, as I mentioned
25 before, the very good performance of special lifting

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

1 devices, and reduced the design margins incorporated
2 in those, and the periodic testing of special lifting
3 devices.

4 This reflects mostly a transition to a
5 different means of verifying the integrity of the
6 structure.

7 And as I mentioned, the design standard
8 with ASME BTH-1 is intended really for again,
9 everything from lifting a component in the Walmart
10 parking lot, to use that example, to a nuclear safety
11 critical lift where there might be significant other
12 safety concerns.

13 And, what changes is the design factors,
14 and the quality applied to the design and initial
15 testing of those devices.

16 But it moves away from the ANSI N14.6
17 guidelines where you could be designing things with a
18 factor of safety of 10 on an ultimate, or a 6 on the
19 yield, which really probably wasn't providing a lot of
20 extra safety necessarily. It's more just ensuring
21 it's well constructed and that the.

22 And, also recognizing the intent of ANSI
23 N14.6 was for applications to shipping containers,
24 which would be moved from side-to-side, and used on an
25 almost daily basis where, and be stored externally

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

1 when most of the, the special lifting devices that are
2 subject to this Reg Guide would be stationary at a
3 single site, and stored in inside structures.

4 Either inside an auxiliary building, or
5 reactor building containment structure for periodic
6 use during refueling, or interim, or independent spent
7 fuel storage installation operations.

8 It also provides for standardization of
9 programs and training. In the fleet now, many lifts
10 are conducted by contracted personnel during refueling
11 outages. So, it helps to have a very standard
12 training and qualification program. This standard
13 helps provide that.

14 It also adds to the scope of required
15 training in that it covers the rating personnel in the
16 training program, as well as the crane operator, to
17 help reduce the risk of below the hook errors.

18 In addition, I've added a section that
19 kind of goes beyond the new, beyond these three
20 standards to address guidance for special conditions
21 where really clear, stand alone consensus standards do
22 not exist.

23 And, this involves areas like large
24 component replacements, such as steam generator
25 replacement activities. Areas where space or

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 structural limitations preclude use of a standard
2 overhead crane with a wire rope hoist, and redundant
3 girders, such as an aug-1 crane.

4 And, a lot of activities involving
5 independent spent fuel storage installations that
6 occur outside nuclear power plant structures, but
7 still pose a risk as to the fuel stored inside the
8 canisters.

9 In other words, for certain applications
10 where the potential drop height exceeds that analyzed
11 for the whatever the canister and overpack design is,
12 for that particular storage cask system.

13 This however, does not apply to Part 71,
14 you know, transportation casks, which are evaluated
15 separately for impact, and transportation accidents.

16 Okay, I did want to address the safety
17 significance. Because of generally good standard
18 regulation and design of overhead handling systems,
19 these provide fairly reliable performance.

20 What we've seen in the nuclear industry is
21 less than what I call one uncontrolled motion, or you
22 know, major drop of a load per 10,000 lifts.

23 So, in other words, it's something on the
24 order of one even -5 per year, or I'm sorry per lift,
25 chance of a major load drop based on the operating

1 experience.

2 And, this comes from generic issue 186
3 related to again, control of heavy loads and the
4 supporting NUREG-1774, which was discussed with the
5 ACRS committee back in several years ago, 2011, I
6 believe.

7 Let's see. So, these, the standard heavy
8 load handling equipment is suitable when a safety
9 function would not be challenged by handling system
10 failure. And there are plenty of those operations in
11 the nuclear power plant facility, and we're not
12 intending to regulate that.

13 But, that is included within the scope of
14 NML-1. And, it provides general controls for standard
15 and special lifts that would fall under that category.

16 And, I should note again, may be covered
17 by the maintenance rule, or you know, as a risk
18 management action for certain conditions.

19 Or, there may be a seismic two-over-one
20 concern with certain cranes that are only used during
21 shut down periods that need to be parked in a location
22 where a seismic event would not cause them to impact
23 other safety related equipment.

24 The enhanced safety handling systems,
25 which is really our focus, reduced the frequency of

1 uncontrolled motion or load drops by well, the staff
2 expects another one to two orders of magnitude.

3 The two orders of magnitude would be
4 associated with those lifts using special lifting
5 devices, which provide the greatest assurance of you
6 know, control of the heavy load.

7 And, the enhanced safety handling systems
8 covered by NOG-1 and BTH-1 then, would be suitable for
9 nuclear safety critical lifts when using cranes
10 designed to that NOG-1, type-1 criteria, and have
11 appropriate lifting devices per NML-1 underneath the
12 hook.

13 Next thing I wanted to touch on was the
14 public comments received. As I mentioned in the
15 introduction, the availability of Draft Guide 1381,
16 was published in the Federal Register on May 4, 2021.
17 And, the comment period was extended to end of July 5,
18 2021.

19 The Nuclear Energy Institute provided 24
20 comments. Eleven were related to clarification of
21 individual items. I'll touch on those in the next
22 slide.

23 Five related to the licensing basis change
24 control processes that might be applied with this, and
25 I guess really to look at how to simplify

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 incorporation of these new endorsed standards in
2 their, in the licensing basis under 10 CFR 50.59, or
3 10 CFR 72.48.

4 Four related to endorsement of additional
5 standards. These are generally secondary standards
6 that are already mentioned in NML-1.

7 And, the staff you know, deliberately
8 selected the three standards that are called out for
9 endorsement because they're related to the design,
10 fabrication, and initial testing, and qualification of
11 permanent structures, or control of the overall
12 handling system program.

13 And, therefore, the other standards are
14 considered secondary references that are really just
15 invoked by NML-1.

16 And, in some cases modified by what's
17 stated in NML-1 as far as their applicability to a
18 particular classification of load handling.

19 And, then four additional comments were
20 related to enhancing the flexibility of operations
21 through credit for administrative controls, or
22 alternative design elements such as for example,
23 doubling the safety factor of some portion of, or some
24 component in the crane.

25 And, the staff generally did not accept

1 those, or agree with those comments.

2 Two individuals provided additional
3 comments that overlapped with NEI comments. These
4 were both related really to below the hook items, and
5 particularly the restrictions on the usage of slings
6 with nuclear safety critical lifts.

7 Okay, the staff did make some changes to
8 the Draft Guide as a result of these comments. The
9 staff clarified the relationship between ANSI N14.6
10 and ASME BTH-1, to identify the you know, that they
11 both cover the design and fabrication of special
12 lifting devices.

13 But BTH-1 does not provide for that
14 demonstration of continuing compliance. That really
15 comes from NML-1, and the secondary standards that it
16 invokes.

17 The staff also clarified that specifically
18 controlled ranges of motion, which is where the crane
19 is limited by interlocks, or just its physical design,
20 or temporary mechanical stops to limit the range of
21 motion of the carried load, such that it would not
22 interfere with essential safety functions if the load
23 were to drop.

24 And, those guidelines covering enhanced
25 safety handling systems, which would involve a NOG-1

1 crane, or some other crane, where the staff
2 specifically accepted its design as providing for
3 enhanced safety might be used with, or I'm sorry, I
4 need to step back.

5 The enhanced safety handling systems that
6 invoke a NOG-1, type-1 crane, and that also use either
7 the special lifting device, device per BTH-1, and NML-
8 1 considering the, you know, the nuclear safety
9 critical lift classification.

10 Those two approaches would be considered
11 complete, or may be classified as complete, acceptable
12 methods of evaluation as it relates to 50.59, or
13 72.48, the licensing basis change control processes.

14 The staff also explained the basis for the
15 sling restrictions during critical lifts to address
16 multiple comments there.

17 The staff slightly modified the regulatory
18 guidance related to assignment and qualification of
19 cranes used for nuclear safety critical lifts with
20 controlled ranges of motion.

21 In that case, you know, we're using a
22 crane with a more standard design, but it's and again,
23 restricted in its range of operation to preclude it
24 from operating in a way that can threaten loads under
25 the, or under or near the crane.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 So, those cranes should be seismically
2 qualified, in other words, to prevent toppling during
3 any motion where they're credited in protecting you
4 know, the range of motion is credited in protecting
5 equipment important to safety, or providing for an
6 essential safety function.

7 Provided the limited clarification for the
8 alternative designs of cranes. In other words, these
9 cranes that do not, or could not be designed using
10 ASME NOG-1, type-1 crane design standard because of
11 either physical constraints of where it's located, or
12 that it's used for a temporary large component
13 replacement, or used outside of buildings for in
14 support of an independent spent fuel storage
15 installation.

16 So, there's alternate design criteria
17 where hydraulic gantry cranes, or other crane designs
18 that don't have an enhanced safety standard developed.

19 The intent there is to provide guidance
20 for applications to come in for license, or for review
21 of that as a safety analysis report change addressing
22 specific handling conditions and cranes, where
23 enhanced safety is credited as the means of protecting
24 essential safety functions.

25 And, then again, clarification of the

1 sling restrictions for nuclear safety critical lifts.

2 So, in conclusion, the staff is endorsing
3 three industry standards related to either the overall
4 handling system program, or specific design of nuclear
5 overhead cranes, a specific type of overhead crane,
6 and the special lifting devices that may be used with
7 those cranes.

8 The staff expects the revised guidance to
9 provide safety and efficiency benefits over the
10 existing guidance provided in technical, NRC staff
11 technical reports developed in the late '70s and early
12 '80s.

13 And, the staff does expect substantial
14 adoption of NML-1, Control of Heavy Loads programmatic
15 guidance through provisions of the licensing basis
16 change control regulations 50.59 and 72.48.

17 With that, I'm open to address any
18 questions the members may have.

19 CHAIR SUNSERI: Thank you, Steve. I
20 appreciate the presentation.

21 So members, any questions for staff?

22 MEMBER HALNON: Yes, Steve, this is Greg
23 Halnon.

24 The little technical questions but you
25 know, 0612 is kind of weaved pretty extensively in our

1 licensing basis throughout the plants, and procedures,
2 inspection procedures and everything else that we use
3 as the NRC inspectors as well.

4 I know that 0612 is like 40 years old but
5 why not just update 0612? I mean, is this is it an
6 expensive change? I mean, when you put the two next
7 to each other, is there going to be a huge change in
8 licensing basis and back fit discussions, and those
9 types of things?

10 MR. JONES: No. There is an appendix in
11 NML-1 addressing compliance, or conformance with the
12 NUREG-0612 guidelines.

13 And, for the nuclear safety critical list,
14 which is really where this applies, they're
15 essentially identical.

16 I guess there's certain things are still
17 going to require license amendments because we can't
18 really address, for example, a load drop analysis
19 where that's credited under certain conditions where
20 you know, you're not crediting the crane or the
21 lifting devices just to prevent a load handling drop.
22 And, it is in an area where it could affect an
23 essential safety function.

24 So, when you're looking at what's the
25 result if you postulate a load dropping, that requires

1 really a license amendment.

2 And, these special or non-standard crane
3 designs where when a NOG-1, type-1 crane can't be
4 used, that's another example where we still expect to
5 see license amendments. And, that really doesn't
6 change because NUREG-0612 is not used.

7 However, I did want to clarify. Because
8 of the commission's back fed and forward fed policies,
9 the you know, NUREG-0612 and NUREG-0554 can still be
10 used, and could still be cited for example, in new
11 applications, if desired.

12 But our intent is to you know, address the
13 operating experience change, the technology changes
14 that have occurred over the years.

15 And, also, we're also trying to meet the
16 Commission and I guess the, really the government's
17 policy to endorse national consensus standards
18 wherever appropriate.

19 MEMBER HALNON: Okay, so it's a voluntary
20 thing --

21 (Simultaneous speaking.)

22 MR. JONES: Yes.

23 MEMBER HALNON: -- that takes that out of
24 the way.

25 What about I assume that there's NRC staff

1 on these committees that develop these, and will be on
2 them to cover any potential changes down the road?

3 MR. JONES: Yes.

4 MEMBER HALNON: Okay. Last question is for
5 decommissioned plants.

6 Do these have applicability there as well
7 when they're moving the hive of the waste and whatnot?

8 MR. JONES: Yes. We have approved license
9 amendments where certain plants needed to be
10 reconfigured, or used specialized, you know, lifting
11 arrangements to support defueling of spent fuel pools.

12 Especially some of the very you know, the
13 older plants where they weren't designed for 100 ton
14 interim storage, or I'm sorry, I keep using interim,
15 but independent spent fuel storage installation
16 storage cask systems.

17 Or multi-purpose systems. Sorry.

18 MEMBER HALNON: So, we should see even the
19 plants that are shut down, adopt at least the
20 applicable portions of these newer standards that are
21 coming out?

22 MR. JONES: Well, and they may. I'm not
23 certain on you know, that. There may be such a limited
24 period where they expect to still be handling fuel.

25 Once the fuel is out of, or is removed to

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 dry storage, they may not have any need to maintain
2 this, the particular part of the heavy loads handling
3 program that deals with nuclear safety critical lifts.

4 MEMBER HALNON: Okay, yes, I got you.

5 MR. JONES: They might not (inaudible)
6 valuable.

7 MEMBER HALNON: Yes, all right, thanks.

8 CHAIR SUNSERI: Vicki, go ahead with your
9 question.

10 MEMBER BIER: Sorry, I guess I'm on mute.
11 Okay.

12 I just wanted to know how this policy
13 would play out in the day-to-day life of say, a
14 resident inspector or somebody.

15 Are they going to notice compliance or
16 problems kind of only at the moment when there is a
17 lift like this, which may be very infrequent, or is
18 there some other method by which they would be
19 reviewing the policies and procedures on site?

20 You know, how would we know if there is a
21 problem before something gets dropped?

22 MR. JONES: The primary areas where this is
23 inspected involve the, the refueling inspection module
24 for operating reactors, and the independent spent fuel
25 storage installation start up inspections, or dry run

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 inspections, where the staff would be specifically
2 looking at handling system design and operation, and
3 their procedures covering inspection and testing of
4 the components during operation. And, also the
5 procedures on how they handle that.

6 So, with respect to inspection, that's
7 where Part 72 would invoke it. For Part 50, this
8 routinely applies to the reactor vessel head
9 movements, the reactor vessel internal lifts, and I
10 guess some other lifts may be invoked.

11 For example, I guess I'm thinking Watts
12 Bar Unit 2 is replacing steam generators in the near
13 future. And, so that process, they're invoking really
14 a load drop analysis type of process.

15 But that's one example where I'm certain
16 the resident inspectors would be following that
17 activity because they have, that's one example where
18 the load crosses.

19 Although the reactor is defueled, there's
20 no safety functions within containment itself where
21 the, the steam generators would be moved.

22 The load path does go over areas where for
23 example, there's two service water lines supporting
24 the operating unit. And, both trains of service water
25 supporting the operating unit. So, that would be

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 Watts Bar Unit 1.

2 So, that those are examples I guess, where
3 this would come up in inspection space.

4 I think this does a better job of maybe
5 highlighting for example, the ANO scatter drop event
6 in 2013 involved a temporary large component
7 replacement activity.

8 And, this Reg Guide kind of highlights
9 that that needs to be assessed very carefully to
10 determine whether or not there's a you know, a nuclear
11 safety lift, nuclear critical safety lift involved
12 with that type of replacement activity.

13 And, what types of reviews might be
14 involved with getting approval for that, if necessary.
15 Or maybe conducting the 50, the evaluation whether
16 it's under the maintenance rule or 50.59 to address
17 that situation.

18 CHAIR SUNSERI: Thank you.

19 Vesna has a question. Vesna, you have the
20 floor.

21 MEMBER DIMITRIJEVIC: Thank you. I don't
22 maybe have a question. I just want to make some
23 observation because the AP1000 and you know, advance
24 reactors were mentioned, but what we saw in the new
25 scale review is actually that the risk, the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 (inaudible) risk is actually dominated by load drop.

2 So, we have a very specific situation when
3 you move the module not only if you drop it, you will
4 damage one (inaudible) but it can (inaudible) to core
5 damage.

6 Also, is not really happening in the shut
7 down, is happening in shut down for the module which
8 is moving for the (inaudible), but is moving in
9 vicinity of operating module, so the load drop can
10 actually damage operating modules.

11 So, in the looking in this is one of the
12 you know, the multi-module designs. An advance
13 reactor, maybe we will need same type-1 plus category
14 for those load drops in the situation like that.

15 So, I just want to make that comment.

16 CHAIR SUNSERI: Thank you. Any response
17 from staff on that or?

18 MR. JONES: Yes. Are staff available to
19 address specifically I think the new scale design?

20 If anyone wishes to come forward.
21 Otherwise, I guess what I'd say is that's really what
22 I intended to address with the safety significance.

23 We expect that you know, the frequency of
24 a load handling problem, especially with a crane
25 designed with you know, to be a NOG-1, type-1 crane,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

1 with a special lifting device conforming with NML-1
2 being used in that process, would have a you know, a
3 probability of failure in the vicinity of 10 to -7 or
4 lower.

5 MEMBER DIMITRIJEVIC: Well, you know, but
6 the risk of these advanced reactors is often in the
7 like, never mind, like 10 to -8 , 10 to -9 categories.

8 MR. JONES: Right.

9 MEMBER DIMITRIJEVIC: So, even 10 to -7 is
10 a very high contributor.

11 But as I remember from the review on the
12 new scale, the risk for their load drop was dominated
13 by operator errors of commissions when they do
14 something not proceduralized, or with instrumentation
15 errors.

16 So, I'm not sure this, the frequency of
17 load drops what they're based on, but this is what was
18 the situation there, so.

19 CHAIR SUNSERI: So, when we look at things
20 like that, we need to consider other than just the
21 cranes themselves, all the other infrastructure around
22 it.

23 Good observation, Vesna.

24 Any other members?

25 (No audible response.)

1 CHAIR SUNSERI: Okay, well thank you for
2 the presentation.

3 I guess I'll now open the floor to anybody
4 listening in to the conversation today, if you would
5 care to make a comment, or provide a remark, this is
6 for the general public.

7 Any members of the general public wishing
8 to make a statement, you can unmute yourself using *6,
9 make your statement, state your name and make your
10 statements and I'll open the floor.

11 (No audible response.)

12 CHAIR SUNSERI: Okay, so we'll close that
13 up and I'll give the same courtesy to any of the staff
14 members, or other participants listening in through
15 the Teams channel, if you'd like to make any comments
16 or statements.

17 (No audible response.)

18 CHAIR SUNSERI: All right, appearing none,
19 or me wrapping this up here then shortly.

20 Let me just say I appreciate the staff
21 coming over here. When I initially reviewed these
22 documents way back a long time ago I felt like it was,
23 you know, the staff was heading in the right direction
24 consolidating, taking industry experience and applying
25 it to the systems.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 Anyway, we asked them to come, and then
2 based on our pretty much extensive conversations
3 during new scale, I knew there was a sensitivity to
4 heavy loads, and I know that a lot of this is not
5 directly applicable, but that may be applicable in
6 some applications.

7 So, I thought it would be useful for the
8 committee members that were interested to hear where
9 the heavy loads program was going, what options would
10 be available, so that as Vesna points out, in the
11 future when we review other advance reactor designs,
12 we'll have a general familiarity with this new
13 standard, if you will, in how it built on the old
14 link.

15 So, at this point, I really as I said,
16 invited them in here as an information briefing. They
17 have not requested a letter from us, and I don't think
18 we need to have a letter, that's my opinion. But I'll
19 just open it up to the members.

20 Does anybody feel otherwise, that we
21 should have a letter?

22 MEMBER HALNON: Matt, this is Greg. Do we
23 have access to these standards? I didn't get a chance
24 to go through all of our documents, but are these
25 standards available to us for our future review on

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

1 the, heavy loads in the nuclear reactors?

2 CHAIR SUNSERI: Yes, yes, we can get the
3 stuff.

4 MEMBER HALNON: Can put these in our ACRS
5 shared folders?

6 CHAIR SUNSERI: Working through our --

7 MEMBER HALNON: Okay.

8 CHAIR SUNSERI: -- our staff members can
9 obtain them for us.

10 MEMBER BLEY: Hey, Greg?

11 MEMBER HALNON: Yes?

12 MEMBER BLEY: This isn't related to today's
13 talk, but we can have somebody on the staff show you
14 how, but we can get to almost any standards and many
15 journals, too, if you need them.

16 MEMBER HALNON: I signed up for that
17 online, Dennis. I was able to get some stuff on
18 there.

19 But it's always, for me it's always a crap
20 shoot if I'm spelling NML right. Nevertheless, I
21 understand.

22 But back to your original question, Matt.
23 I'm not, unless the staff feels they need some
24 confirmation from the committee, I don't think a
25 letter would be necessary.

1 MR. GARDOCKI: This is Stan Gardocki, can
2 you hear me?

3 CHAIR SUNSERI: Yes.

4 MR. GARDOCKI: Stan Gardocki, I work in Reg
5 Guide branch, and we interface face you were asked on
6 the Reg Guides before were published.

7 We just need a confirmation from the ACRS
8 that there is no comments in regards to this Reg Guide
9 before we publish it here in the next couple of weeks.

10 If you can put it in the meeting summary
11 notes or something like that, then we can have
12 confirmation that there's no, ACRS did not have any
13 comments on the Reg Guides.

14 CHAIR SUNSERI: Can that confirmation come
15 the first week of December, or you need it earlier
16 than that?

17 MR. GARDOCKI: No, that's fine.

18 CHAIR SUNSERI: Okay. So, we normally do
19 that in our Planning & Procedures discussion in full
20 committee meetings, and will do that this time.

21 MR. GARDOCKI: Great. Yes, we normally get
22 the letter, and that letter we used as the
23 acknowledgment to go forward in the process, that ACRS
24 didn't have any comments on a procedure in the Reg
25 Guide.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1716 14th STREET, N.W., SUITE 200
WASHINGTON, D.C. 20009-4309

(202) 234-4433

www.nealrgross.com

1 CHAIR SUNSERI: Yes, so we'll follow that
2 process seems.

3 MR. GARDOCKI: Thanks.

4 MEMBER MARCH-LEUBA: This is Jose, and I
5 know I'm playing a broken record but we have example
6 today of two Reg Guides with members benefit from a
7 memo type procedure where we do this P&P in a more
8 formal way.

9 And, I know I keep pushing it, and you
10 guys keep voting no but I, we need to do something
11 that is simple, unpainful, and that satisfies
12 everybody.

13 I'll leave it at that.

14 CHAIR SUNSERI: Thank you. Anyone else?

15 (No audible response.)

16 CHAIR SUNSERI: Okay, well thank you to the
17 staff for the presentation today. Thank you to the
18 members for your attention, and at this time we are
19 adjourned.

20 Have a good day.

21 (Whereupon, the above-entitled matter went
22 off the record at 3:09 p.m.)

23

24

25

Draft Regulatory Guide 1.244

Control of Heavy Loads at Nuclear Facilities

Steven Jones, Acting Chief
Containment and Plant Systems Branch, NRR
Presentation to the Advisory Committee on
Reactor Safety, Subcommittee on Regulatory
Policies and Practices
November 16, 2021

Agenda

1. Introduction
2. Existing Guidance
3. Proposed New Guidance
4. Safety Significance
5. Response to Public Comments
6. Conclusion

Introduction

- Purpose of RG 1.244:
 - Endorse appropriate consensus standards for control of heavy loads
 - Update guidance contained in current technical reports
 - Expand applicability to include lifting devices used for major component replacement and spent fuel storage
- These consensus standards provide updated guidance for heavy load handling programs, including:
 - methods to assure safety functions are accomplished considering equipment failures and effects of natural phenomena
 - standards for operation, maintenance, and testing of handling systems, especially enhanced reliability systems

Existing NRC Guidance

- NUREG-0612, “Control of Heavy Loads at Nuclear Power Plants”
 - Provides criteria for protection of safety functions
 - Specifies good practices for the handling of heavy loads
- NUREG-0554, “Single Failure-Proof Cranes for Nuclear Power Plants”
 - Provides criteria for crane design, fabrication, and testing
 - Specifies features to control load following component failures, natural phenomena, and operator errors
- ANSI N14.6, “Radioactive Materials—Special Lifting Devices for Shipping Containers Weighing 10 000 Pounds (4500 kg) or More for Nuclear Materials”
 - Provides criteria for lifting device design and testing
 - Specifies inspection and testing to verify continued compliance

Proposed Endorsed Standards

- American Society of Mechanical Engineers (ASME) Standard NML-1-2019, “Rules for the Movement of Loads Using Overhead Handling Equipment in Nuclear Facilities”
 - Replacement for NUREG-0612
 - Qualitative risk-informed approach
 - Scope expanded for wider use at nuclear facilities
 - Updated to reflect operating experience
 - Restrictions on use of slings
 - Simplified testing for special lifting devices

Proposed Endorsed Standards (cont.)

- ASME Std. NOG-1-2020, “Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)”
 - Replacement for NUREG-0554
 - Reflects current technologies
- ASME Std. BTH-1-2017, “Design of Below-the-Hook Lifting Devices,” Chapters 1-3 (mechanical devices)
 - Provides criteria for the design and fabrication of special lifting devices and load lifting attachments
 - NML-1 and BTH-1 combined address scope of ANSI N14.6

Effect of New Guidance

- The staff expects endorsement of these three industry consensus standards to provide safety and efficiency benefits.
 - Incorporates lessons from several decades of operating experience
 - Administratively restricts sling usage to straight connections to specially designed attachment points or basket configurations around large diameter rounded objects for safety-significant lifts
 - Reduces design margin and burden of testing special lifting devices based on high reliability
 - Wire rope cranes take advantage of new designs to eliminate risk from two-blocking and provide controlled lowering systems
 - Standardization of programs and training
 - Many lifts conducted by contracted personnel during refueling outages
 - Adds riggers to scope of training included in program to reduce risk of below-the-hook errors
- Flexible guidance included for special conditions
 - Large component replacement (e.g., Steam Generator Replacement)
 - Space/structural limitations preclude NOG-1 crane
 - Outside nuclear power plant structures (e.g., ISFSI Operations)

Safety Significance

- Standard nuclear overhead handling systems provide reliable performance
 - Less than one uncontrolled motion per 10,000 lifts based on operating experience
 - Suitable when safety function would not be challenged by handling system failure
 - NML-1 provides acceptable controls for standard and special lifts
- Enhanced safety handling systems
 - Reduce frequency of uncontrolled motion by 1 to 2 orders of magnitude
 - Suitable for NML-1 Nuclear Safety Critical Lifts when using crane designed to NOG-1, Type I criteria and appropriate lifting devices

Public Comment

- Availability of Draft Guide 1381 for public comment published in Federal Register on May 4, 2021
- Public comment period ended on July 5, 2021
- Nuclear Energy Institute provided 24 comments:
 - 11 related to clarification of specific items
 - 5 related to licensing basis change control process
 - 4 related to endorsement of additional standards
 - 4 related to enhance flexibility through credit for administrative controls or alternative design elements
- Two individuals provided additional comments that overlapped with NEI comments.

Changes to Draft Guide

- Background
 - ANSI-N14.6 and ASME BTH-1 relationship
 - Clarified that controlled ranges of motion and enhanced safety handling systems constitute complete acceptable methods of evaluation
 - Explained basis for sling restrictions during critical lifts
- Regulatory guidance
 - Seismic qualification of cranes used for nuclear safety critical lifts with controlled range of motion
 - Clarified criteria for alternative crane designs for critical lifts
 - Clarification of sling restrictions for critical lifts

Conclusion

- The staff is endorsing three industry standards
- The staff expects the revised guidance to provide safety and efficiency benefits
- The staff expects substantial adoption of NML-1 control of heavy loads program guidance through the provisions of licensing basis change control regulations