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# UNITED STATES OF AMERICA

# NUCLEAR REGULATORY COMMISSION

**Title:** **BRIEFING ON THE EVALUATION OF THE REQUIREMENTS FOR LICENSEE TO UPDATE THEIR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAM EVERY 120 MONTHS - Public Meeting**

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

OFFICE OF THE SECRETARY

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BRIEFING ON EVALUATION OF THE REQUIREMENT FOR LICENSEE TO UPDATE THEIR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAM EVERY 120 MONTHS

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Building 1, Room 1F-16
11555 Rockville Pike
Rockville, Maryland
Friday, March 24, 2000

The Commission met in open session, pursuant to notice, at 9:30 a.m., the Honorable RICHARD A. MESERVE, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

RICHARD A. MESERVE, Chairman of the Commission
GRETA J. DICUS, Member of the Commission
NILS J. DIAZ, Member of the Commission
EDWARD McGAFFIGAN, JR., Member of the Commission
JEFFREY S. MERRIFIELD, Member of the Commission

STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

KAREN D. CYR, General Counsel

ANNETTE L. VIETTI-COOK, Secretary

JAMES A. PERRY

RALPH BEEDLE

WILLIAM SHACK

BRIAN SHERON

FRANK MIRAGLIA

JACK STROSNIDER

THOMAS SCARBROUGH

P R O C E E D I N G S

[9:30 a.m.]

CHAIRMAN MESERVE: Good morning.

Today the Commission will be briefed by staff, ACRS, and industry representatives on the requirement for licensees to update their in-service inspection and in-service testing program.

That's the ISI and IST programs.

Current regulations require licensees to update these programs every 10 years to the latest edition of the American Society of Mechanical Engineers' boiler and pressure vessel code, as incorporated by reference in 10 CFR 50.55(a).

The staff has proposed, in a paper currently before the Commission, to eliminate the update requirement. In addition, staff recommends that ISI and IST requirements be baselined to the 1995 edition of the ASME code, with the 1996 addenda.

Thereafter, program updates to a later edition of the ASME code would be voluntary on the part of licensees, unless the staff establishes new baseline requirements in accordance with 10 CFR 50.109, which, of course, is our backfit rule.

We have two panels today.

The staff will be in the second panel, and I'd

like to introduce now our first panel.

They are Mr. Ralph Beedle, Senior Vice President and Chief Nuclear Office of the Nuclear Energy Institute; Mr. James Perry, Past Vice President of Nuclear Codes and Standards, who is here representing the ASME; and Dr. William Shack of the ACRS.

We very much welcome you here this morning.

The Commission specifically appreciates the opportunity to have a question-and-answer interaction with the panelists, so that we'd ask that you be careful to abide by the time on your prepared statements.

Let me turn to my colleagues to see if they have any opening statements, and if not, why don't we proceed?

Mr. Beedle?

MR. BEEDLE: Thank you, Mr. Chairman, Commissioners. Good morning.

I would like to address two points today:

One, some comments concerning standards development and then, second, some specific comments concerning the proposed rule-making.

If I may have the next slide -- in fact, we can go to slide three.

Standard development organizations have made a positive contribution over the years to providing the industry with codes, standards, and guides for the design,

construction, testing, and inspection of our systems.

The fundamental purpose of the standards is to recognize sound engineering practice and framework for the application of state-of-the-art technologies such as instrument -- digital instrumentation and control, fiber optics technology, eddy current testing, and so forth.

The consensus process and the balance of interest fundamentals to all standard development must be sustained, with continued participation by the user community -- that is, the manufacturers, consultants, architect engineering firms, utilities, and the Federal agencies.

As technological advancements are made, the user community will demand the development of new and revised codes and standards, and the extent of user community participation in future codes and standards will certainly develop as a result of practical need and economic value of future codes.

Next slide, please.

If we could go to slide four?

The National Technology Transfer and Advancement Act and the associated OMB circular enables Federal agencies to use technical standards developed by industry consensus standards organizations, with an intent to encourage Federal agencies to benefit from the private sector, to promote Federal agency participation, and to reduce the reliance on

Government-unique standards.

The NRC involvement and industry participation in standards development has been extensive, and it is clear that the NRC has benefitted from this effort.

Go to the next slide.

According to the NRC's annual report to the OMB, staff has participated -- there have been 145 staff members participating in some 18 standard development organizations involving 260 writing committees, and as a result, seven standards were incorporated by reference in 50.55(a), 30 were adopted in six regulatory guides, and eight were adopted in a single reg guide.

Overall the NRC has endorsed some 4,000 codes and standards within the regulatory framework.

According to the SECY 99-029, there have been approximately 20 such consensus standards mandated through rule-making, and hundreds of consensus standards have been endorsed for voluntary implementation throughout the reg guide and NUREG process.

It is not surprising that the extensive utilization of these codes and standards and associated changes, plus the endorsement process have resulted in some delays and some confusion as we go about this process, but nonetheless, it has overall been a successful process.

I would suggest that this particular rule-making

is one that has suffered from the time delays in that we have been working on this since about 1991, and we're hopeful that, as a result of this meeting today, we'll finally see some conclusion to that.

Next slide, please.

Let me now turn to the proposed rule-making.

In SECY 00-11, it discusses several options concerning voluntary updates of various additions to the ASME boiler code.

The NRC staff has acknowledged that each of the options discussed in the SECY paper provide an acceptable level of safety, and the industry agrees with the NRC's staff evaluation in that regard.

The staff also concludes that the code changes that are associated with these options are not justified when compared to cost implementation imposed on the licensees, and we concur with the staff assessment in that regard, as well.

Next slide, please.

The question of cost-benefit and demonstrated safety improvement with regard to 50.55(a) has been a longstanding issue within the industry and the NRC, and this is one of the fundamental issues that we hope to address today and reach some consensus based on the decision of the Commissioners.

The NRC and the industry have been involved in rule-making since 1991 and in '93, when Entergy Corporation submitted a cost-beneficial rule-making that would suspend the periodic update of the ISI/IST requirements, or the 10-year ISI.

We continue to believe that these recommendations that the staff has proposed represent sound regulatory policy and are consistent with the Commission's stated performance goals.

Next slide, please.

In the SECY before you, the staff has recommended option 1B, and while we agree that the option 1B would be an improvement, we would like to see the basis for that actually be the 1A, in which we would go back to the 1989 code, although we recognize the problems associated with that.

The fundamental industry position is that we would like to see the requirement for the 10-year ISI suspended and that any future revisions to the code be implemented through the backfit rule process evaluated by the staff and the industry on the basis of cost-beneficial analysis.

So, with that, Mr. Chairman, I would conclude my remarks and await questions at the end of the panel.

CHAIRMAN MESERVE: Why don't we complete the statements, and then we'll turn to questions.

Mr. Perry.

MR. PERRY: Good morning, Commissioners.

On behalf of ASME, we wish to thank you for the opportunity to brief you on our evaluation of the requirements for licensees to update their in-service inspection and test programs.

In our view, the current update requirements should be maintained.

ASME codes are first and foremost safety codes. They are intended to protect the health and safety of the public by maintaining pressure boundary integrity and operational readiness of the mechanical equipment. Since the proposed change to the regulation is based on burden reduction, I will address that specific aspect.

Next slide, please.

Benefits outweighing the cost: This relates to Commission performance goal dealing with reduced unnecessary regulatory burden.

The benefits of updating the in-service inspection test programs outweigh the cost.

The process of updating the programs focuses on an evaluation of the entire program. It allows you to identify deficiencies and also serves as a basis for making corrections and enhancements.

The update provides for standardization and

consistency of requirements.

This will be lost if the 120-month update is not required in the future.

Now, using the ISI program as an example based on informal feedback from seven utilities, they estimate the average cost of updating to be about $200,000, or roughly $20,000 for each year of the 10-year interval between updates.

Likewise, the O&M code costs are estimated at about 125,000.

I think these are consistent with what the staff reported on the proposed regulation change.

Now, it's important to note that, of this cost, the NRC mandated one-time cost to add containment inspection, IWE/IWL provisions, plus the addition of Appendix VIII on performance demonstration for ultrasonics, adds significantly to these totals.

So, they are mandated, according to the original proposal.

In addition, there are costs that will be incurred as review fees for exemptions and relief requests needed to use costs or rules from later editions of the code.

For example, typical cost for a relief request backed by ASME code cases ranges from 10 to 15 thousand per request.

The cost of relief requests not supported by code cases can range anywhere from 50,000 to a half-million dollars, depending on the complexity of the issue.

It is a certainty that, if this proposal is approved, relief requests will dramatically increase, causing an increased burden not only on utilities but the NRC staff, and I think it would be counterproductive.

Now, in my view, if I were a utility executive still -- I was one at a utility as a vice president.

If I were at a utility and someone were to ask me, if you could save the cost of this update, you know, recognizing the current environment, and it wasn't mandated, would you be for it?

Absolutely, I would be for it, but that's a short-term objective, I submit, and I think that we need to be looking at the difference between a short-term focus, which is one what is the administrative costs of making the update, versus the long-term focus, which should be what's the net benefits gained in implementing this over the balance of life of the plant, and I submit that many of these changes reduce the cost significantly over going to the old version of the code.

Next chart, please.

Now, the ASME codes are really living documents, and this subject relates to the Commission performance goal

of maintaining safety.

They are living documents because they incorporate new and improved methodologies in inspection, testing, design, and materials.

They also reflect lessons learned from hundreds of cumulative years of nuclear reactor operating experience. The original code was based -- was very conservative, based on fossil plants, non-nuclear.

We've learned a lot since then.

In addition, the ASME codes are now moving from the traditional, prescribed repetitive inspections and tests to more risk-informed, performance-based condition-monitoring approaches, and these rank high on the Commission's priorities in terms of risk-informed, for example, as well as ASME's.

I'd also like to point out that ASME has responded to requests directly from the NRC on issues important to safety.

For example, the old comprehensive pump test is one that originally the Commission asked for and is now included in the O&M code.

Another one has to do with the probabilistic risk assessment standard.

That's been a very high priority, and we're making good progress on that, and I think that ties directly in

line with the direction the NRC Commissioners and staff members are moving toward.

Next chart, please.

Summary of the changes to the codes from '89 to '99: This, again, relates to maintaining safety.

This chart summarizes a number of ASME changes from 1989 to 1999 by change category for the boiler pressure vessel code section 11 dealing with in-service inspection and the operation and maintenance code dealing with the in-service testing.

A copy of the description of the actual changes, the proposed purpose, benefits, and classification of the changes has been provided to you as part of our back-up information package.

You will note that there are 15 IS's, improved safety, and 29 RRE, reduction in radiation exposure changes. These reflect operational experience to assure safety and ALARA considerations, and incidentally, I consider the reductions in radiation exposure to be safety-related, because obviously we're interested in ALARA, keeping them as low as possible.

That also translates into dollar savings, because each man-rem of exposure that's avoided saves approximately $10,000, I think is one norm that I've seen used.

Now, these individual and subtle changes that

improve safety and reduce radiation exposure have cumulative significant beneficial effect that can't be overlooked.

Now, many of the changes that we classify as improved industry standards and reduced radiation requirements relate to reductions in examinations and tests and new methods for repair and flaw analysis.

Many of the maintenance-classified changes reflect feedback from inquiries, clarification of requirements, or administrative-type changes.

So, for an average layman, looking at the code is very complicated, but if you look at it, you say, well, these are just minor changes, word changes.

But I can submit to you, gentlemen and ladies, that being on the codes and standards committees for over 17 years and seeing how they process these and what they have to go through for consensus, they all have a valid basis of justification to make the change and have to go through the consensus process before they're actually issued.

Next chart, please.

ASME consensus process and use of volunteers: This subject relates to Commission performance goal of increasing public confidence, because we use an open system, all the meetings are open, the information is available to everybody, and we encourage it, and changes that are being proposed still have to go through a review cycle, public

review, just the same as the NRC regulations by the ANSI process.

But ASME's ANSI-approved procedures require a broad-based balanced group of volunteer experts to serve on the codes and standards committees that produce approved code changes and code cases.

The members include approximately 30-percent utilities, 30-percent consultants, and the remaining 40 percent include balance of interest categories that include regulators, enforcement agencies, manufacturers, and insurance company inspection agencies.

Now, by procedure, there cannot be anymore than one-third of the total membership from any one category of interest, and that's how we keep it balanced. I think it's served us well.

The collective effort of all of the volunteers working together on ASME committees, the subcommittees, the subgroups, and work groups to update the codes provide what I call a multiplier effect in direct support of the 120-month update.

In other words, we're using these collective resources of all of these volunteers toward a common purpose and objective related to the 120-month update.

This is considered, in my view, superior to the individual effort of any single category of interest group,

such as an owners group, or even NEI, from that point. You don't have the broad cross-section of all the participants, including NRC participating.

The consensus process is required to be used by each of the ASME codes and standards committee, and it requires that all views and objections be considered, that an effort be made toward the resolution.

Now, there has been strong feedback from our volunteer members on the ASME committees that their travel and participation will be cut back in the event the current code becomes voluntary.

I think it makes sense. Many utilities and manufacturers are struggling to try to reduce cost, and if this is only going to be voluntary, then the benefits may not be there, so they may choose not to contribute, and I think the same thing may be true with the NRC, based on your reductions in force and so forth.

Now, this will make it more difficult for ASME to respond to the critical issues affecting safety, such as aging and degradation of components.

Next chart, please.

Negative impact of deleting the update requirements: This relates to the Commission performance goal of making NRC activities and decisions more or less effective, efficient, and realistic.

In my view, this one makes it less.

If the future changes to the ASME code become voluntary, then the impact on the changes to a range of code additions and addenda applied by licensees is expected to be great.

This will have a negative impact due to inconsistent implementation -- in my view, cherry-picking, where you selectively pick what you want and don't apply the others -- and incidentally, I said the code is fairly complex, and unless someone is very familiar and knowledgeable, there is an opportunity for selecting something and not taking all the other pieces that go with it, so creating additional errors.

Also, there would be lack of uniformity and consistency in verifying conformity.

It's unlikely that the entire additions or addenda will be implemented. Thus, numerous relief requests will be needed to be handled by the NRC staff, increasing their workload.

By deleting the update requirements and making future code additions and addenda voluntary, my personal prediction is that the NRC will place less, nor more, emphasis and apply a lower priority to NRC representatives participating in code committee activities and timely endorsement of these revised codes, and I cite the NQA

activities as one.

We've tried to work with the staff to try to get them to endorse the later codes, and they talk about problems with budgets and so forth.

Unless there's a big groundswell, they're not going to do it, and there is one where it's not mandatory but it's recommended.

Currently, the regulation lags four years behind the current code, and many code cases still have not yet been included in the latest regulatory guides, and I cite as an example -- there's a letter that ASME sent to the NRC back in July 1997 identifying some 31 approved code cases related to in-service inspection that were not picked up in the proposed Revision 12 to Reg. Guide 1.147, and I submit to you many of those are very significant.

One of them on code case 560 alone could save the industry millions of dollars having to do with D.J. Wells and reductions using more advanced techniques.

And so, as these are delayed, I think the impact on the staff is greater and on the industry is greater, because you have to go in and get specific approval requests and exemptions in order to allow you to use these.

Finally, last chart, in conclusion, by keeping the 120-month update, we maintain the stable system which works to provide an integrated approach to safety improvement and

burden reduction.

Maintain the update process. It works well. Use option 2.

Thank you very much for allowing us to present our case to you, and thank you for your kind attention.

CHAIRMAN MESERVE: Thank you.

Mr. Shack?

DR. SHACK: Okay.

The ACRS also strongly recommends that we retain the 120-month update requirement, the option 2 requirement.

In this case -- you know, the ACRS occasionally has different opinions.

I think this is not merely a consensus view of the ACRS.

This is a unanimous view of all the members. Those with utility backgrounds, I believe, are particularly supportive.

We might only sort of vary in our degrees of adamancy.

Many of the arguments related to dropping the update are related to the maturity of the inspection process. We just don't see it.

When we look at what's being proposed, there have been very significant changes in the last 120-month update period.

The staff recognizes that in their recommendation to especially include the performance demonstration for the ultrasonic testing, which I think is a particular significant update since the 1989 edition.

We believe that there will continue to be important changes as we go to risk-informed inspection, as we develop new technology.

Some of these inspections may, in fact, eliminate inspections.

As the ASME has noted, reducing unwarranted exposures is also a contribution to safety.

We believe these inspections are an important part of the aging management programs that we have for license renewal and that because the ASME provides essentially a peer review of these inspection requirements, as the ASME representative noted, an extremely broad-based group, we think it increases the stakeholders' confidence in the effectiveness of the inspections, and that's important for building confidence in the whole license renewal process.

The basic justification for dropping the update requirement is a cost one, that it's just not warranted.

We've seen conflicting evidence or estimates of the cost in the presentations to the ACRS. We haven't found any of them particular definitive.

Our conclusion is that the net costs either way,

whether they're a decrease or an increase, are fairly modest, and so, I think there's not a strong cost case to be made for dropping the update.

The other part of the process that particular concerns us is the notion that our defense-in-depth requirements really should be subjected to the backfit analyses, and again, while we all agree on the update, we have a variety of opinions on defense-in-depth.

But again, if you look at defense-in-depth as part of the engineering approach when used to achieve low-risk, you can evaluate the effectiveness of that process by PRA, and you can do cost-benefit analyses of additional design changes to do that.

ISI and the update process, however, really don't follow from that design application of defense-in-depth; they follow from the structuralist approach, that even though our engineering has reduced the risk to acceptable levels, we believe that the integrity of these systems is so important that defense-in-depth measurements, like ISI and the update, are justified in this argument that, just in case we are wrong, just in case there's something we've missed, that although we believe the systems have been designed for low-risk.

Single-failure criterion, pipe risks are low risk, but we believe that additional defense-in-depth measures

like an effective in-service inspection program are an important element in that defense-in-depth approach, and the update process is an important part of the inspection -- ensuring the effectiveness of the inspection approach.

And that concludes my remarks.

CHAIRMAN MESERVE: I'd like to thank you all very much.

Mr. Perry, could you say something about how the ASME updates are applied outside of the nuclear context? I mean are non-nuclear boilers, for example, typically required by states to update?

MR. PERRY: I think one of the conflicts that we see, if you eliminated this, is that many states that mandate ASME codes require them to be done to the latest ASME code requirement, so they are kept current with the latest one, and this would just make that disparity further and further apart.

So, it makes it difficult for the people who are trying to enforce it to try to justify the difference between a statement requirement and a Federal requirement, such as section 3, you know, manufacturers who are building components to the code.

CHAIRMAN MESERVE: Do I understand you to suggest that, overtime, then, we would have non-nuclear plants that were forced to comply with more modern codes than nuclear

plants?

MR. PERRY: Right.

CHAIRMAN MESERVE: Could you say something about how the ASME considers costs, whether it considers cost, as it evaluates the update process?

MR. PERRY: Yes.

The code being a safety code, of paramount importance is those measures that protect the health and safety of the public. That's paramount, but a secondary criteria has to do with what's it going to cost to implement it?

So, I'll use an example of what section 11 has been doing over the last several years.

They have many, many changes that are being considered, and so, to try to get them on their agenda, they prioritize them, and they prioritize them related to -- basically related to a safety enhancement or a burden reduction or maintenance-type item, and then they further subdivide it as to high rating of priority or low priority within each of those.

So, as they're reviewed and evaluated, there's generally a white paper that goes with it, particularly the more complex ones, that explains what the purpose of this is and what the advantages are.

Now, they don't do a finite cost-benefit analysis,

but I can tell you for a fact that the people who sit on the committees, particularly the ones that have to be -- that are going to be implementing it, are very conscious of what's it going to cost to implement this change and is it beneficial or not?

So, there is a balance between enhancing the health and safety and maintaining costs, and I think they've become -- I think the ASME committees have become more sensitive to this over the last probably five to 10 years based on the direction industry is going and what it costs to maintain competitiveness.

CHAIRMAN MESERVE: Mr. Beedle, I noticed that, in your comments, you didn't mention cost, but there is -- as I looked through the materials, and I think as Dr. Shack had indicated, there is a range of estimates of costs, I think on the low side are on the order of 200,000 up to as much as 1.5 million a year.

Can you comment?

Is there any reliable information as to what these updates really cost?

MR. BEEDLE: The information we've gotten from the utilities would indicate that that's probably a reasonable range, you know, one-and-a-half million down to maybe half-a-million dollars, aggregate somewhere on the order of 55 to 155 million dollars throughout the industry.

So, it's not an insignificant amount of money on that.

I don't believe we're talking about abandoning the code development process that ASME has.

I think we're really focused on the ISI/IST requirements for the nuclear plant and to update those on a 10-year interval, and so, if the impression is that, by not having that requirement, that the nuclear plants are less safe in the operation compared to the non-nuclear facilities in this country, I don't think that's the case at all. These plants were built to the code.

When ASME updates some of the code, we don't go back and re-do all of those pressure vessels that we have. We built them to the code at the time they were constructed, and if we build a new plant, even if there was no 10-year ISI update requirement, we would build them to the code as it stands today.

So, I don't think we're talking about the whole plant.

CHAIRMAN MESERVE: I understand that.

MR. BEEDLE: So, I want to make sure we don't get diverted on that one.

CHAIRMAN MESERVE: Mr. Perry, you wanted to say something?

MR. PERRY: I'd like to give you my impression, my

own personal opinion about the cost difference.

In my view, there's two types of utilities involved in updating the in-service inspection test program. So, you're going to get a wide range of numbers from each of those.

On one hand, I think those utilities who have representatives that are actively participating in the code committees are very cognizant of what the changes are and what's the impact and what's the value involved.

So, on one hand, I think those utilities can make the update at a much lower cost because of their personal involvement and doing it in-house, as opposed to another utility, the other extreme, let's say they haven't been involved with the code changes at all, they're just going with what they have.

Now, all of a sudden, they're getting to the end of the 10-year interval, they have to update.

Well, what's this all mean, trying to get caught up at the last minute, and they find themselves going out and hiring somebody else to develop changing the program and modify all those procedures and train their people, significant difference in the cost of those.

CHAIRMAN MESERVE: Mr. Beedle, you'd also suggested that we might depart from the staff and go to option 1A, which was to go back to the 1989 code.

The Commission had previously revised the rule to put us to the 1995 code with, I think, the 1996 amendments.

So, it appears that your request is that we backslide from where we are, and could you comment about why we should depart from a decision we've already made?

MR. BEEDLE: Chairman, I would never suggest that you should backslide. I wouldn't want to encourage that at all.

No, our recommendation has always been, since the outset of this discussion, to -- we agreed with the staff's decision to baseline at the '89 code -- or '89 update -- and to eliminate the 120-month update.

So, we're -- I think we're consistent in that regard.

The Commission's decision to go to the '95 edition -- we don't have any major objection to that, although, given an option, I would just as soon go back to the one that we recognized was fundamentally sound.

So, I guess, if you're going to depart from your original decision, then we'd recommend you go back to the '89, but I certainly don't want you to backslide.

CHAIRMAN MESERVE: Okay.

Dr. Shack, I have just one question for you.

The main thrust of Mr. Beedle's comments was that we apply the backfit requirements in all kinds of other

contexts, and you talked a little bit about why this was different and that we ought to not apply those requirements with regard to this code just in case we are wrong and because it's related to defense-in-depth, and I'm a little concerned that that gets us on a slippery slope, that there are lots of things that might fall into the area where they're defense-in-depth-related or we might be wrong with our existing requirements and, therefore, should update, and it seems to me the argument that you've made could create a exception to the principle for exceptions to the backfit rule, which is a troubling one, and I wonder if you could comment.

DR. SHACK: Well, the ACRS did write a letter saying that we needed some additional guidance and policy on defense-in-depth for precisely that reason, that -- you know, defense-in-depth arguments are difficult to justify on the basis of risk.

You know, we have designed these systems so that the risk of pipe failure is small, and from a risk argument, you might argue that you don't need ISI at all, let alone an update to the ISI requirements from a purely risk update.

So, we believe that in-service inspection is a defense-in-depth requirement. It's not really related to a reduction risk. It's related to essentially a reduction in the uncertainties associated with any possible estimates in

that risk, and again, the structuralist point of view, and again, it can lead you to a slippery slope, you know, and without policy and guidance, you are left on a case-by-case basis.

You know, our judgement is, in this particular case, this is an important application of defense-in-depth, at a high level and an important level, and ought to be retained.

CHAIRMAN MESERVE: Other than the fact that you sort of know it when you see it, can you tell me why ISI and IST is different from other things that are arguably defense-in-depth-related?

DR. SHACK: In-service inspection, because it does -- you know, the one thing that you can't do is predict the future, you know, and you can't be assured in every engineering analysis you've considered everything, and so, in-service inspection is that -- the suspenders to the belt that looks for things that, you know, you've missed and phenomena that you haven't anticipated in your design, and so, you know, that's one argument, for example, that -- you know, we wouldn't support updating every update in the consensus code, that's not the thing, but ISI on the primary pressure boundary we believe has a fundamental importance. People don't like leaks from their primary pressure boundary, like steam generator tubes.

CHAIRMAN MESERVE: Mr. Perry?

MR. PERRY: I would like to just add a comment, if I could, too, along those lines, relative to maintaining pressure boundary integrity and operational readiness.

I think, in the proposed amendment to the rule, the staff's own words indicated to the effect that the question of the backfit rule that was previously questioned by ADI and, I think, NUBAR, the Commission's position was they maintained that there wasn't sufficient justification to support their argument and that the Commission's position was that they would continue to apply it on routine updates of the ASME code, which has been the practice in the past, up until now.

Now, I'll submit to you this: One of the changes that you've incorporated in the latest regulation on the O&M code has to do with the pump -- integrated pump testing that I mentioned was requested by the NRC.

Now, in my judgement -- that's in the regulation now.

In my judgement, I'm not sure that it would meet the backfit rule if you tried to apply it.

So, I think you need to be cognizant of that, too.

Now, that certainly has a big impact on enhancing safety, but it may not, you know, meet this criteria of significant safety impact.

So, I think we have to -- you know, I look at it from the point of view of what does the public's view of how we're protecting their health and safety mean, and I think that we're not talking about -- certainly, the plants are not -- they are safe, but certainly, if we can do things better, if we learn from our experience and we can improve and we can reduce costs in the process and enhance safety, I think we ought to do it, but to say no, we're not, make it non-mandatory, we're changing the rules, and I think we have to answer to the public, well, why is it now -- you know, they're saying the utilities are being forced to cut back, they've got to be more competitive, and so forth.

So, I think it puts the Commission in a bad light, in my view.

CHAIRMAN MESERVE: Commissioner Dicus.

COMMISSIONER DICUS: Okay. Thank you.

Let me put my first question to Mr. Beedle, NEI, and it really has to do with the issue of cost, so I want to pursue that a little more, because you clearly made cost an important part of your discussion.

The ACRS suggests that cost is maybe not that much of an issue, and I think even the ASME questions the cost thing.

So, I have to ask you, when we look at this as a possibility of reduction of unnecessary burden -- i.e., the

cost -- is this the main concern of the industry, the only driver behind your recommendation, or is there something else?

MR. BEEDLE: Well, I think cost is important, Commissioner, but I don't think that that's the main focus.

The main focus is we have a process that's employed in the regulatory framework in every area except this one, and it's the backfit analysis.

We look at what is the gain versus what it's going to cost the industry, as well as the NRC, and the impact of implementing those regulations, and we're reasonably confident that this needs to be subjected to that same process.

Now, the issue of ISI -- we're not saying we're abandoning the test of these plants.

We're not saying we're not going to do the inspection of these plants.

We're not looking for leaking reactor vessels and pipes, and I don't think that, if we stopped doing an automatic update of the ISI program, that it's going to cause these plants to fall apart.

So, any suggestion from anybody that that's the case, I think, is absolutely misleading.

We still have an inspection program.

The question is the incremental change in the

inspection program that's developed through the ASME code process -- is it warranted from a cost-benefit point of view, as examined by the backfit rule?

COMMISSIONER DICUS: I think that helps some, but I think the focus of your comments were on cost, and I was a little concerned about that.

If that's the only driver we have, we've got to look at the secondary drivers that are there.

Let me go to a question with the ASME representative, Mr. Perry.

It has to do with your slide four, which is a very interesting slide, but I have to tell you, I found it confusing and not particularly helpful.

Even when I went to the back-up material, that didn't help a whole lot.

I appreciate the back-up material and what you went in to try to define in detail.

I'm not sure I understand the difference between primary basis and secondary basis, but also, of all these things -- and I might center in, which would mean a lot to me, the reduced radiation exposure -- what are the most significant changes? To me, I didn't pull that out of your material.

These changes, in the last 10 years -- what is really important?

MR. PERRY: Okay.

Let me first answer your question by explaining the difference between primary and secondary basis.

What the section 11 subgroups did is they evaluated each of those changes and tried to classify them according to -- they relate to improved safety or improved industry standards or reduction to radiation exposure and so forth, and when they wrote down on that back-up sheet the first one, that was their primary classification, but they said, you know, it's not just that, there's many others that are impacted. So, they would show several other bases, as well, and so, they call those secondary.

What I've tried to show here is the combination of the primary and secondary.

In fact, my personal view is I think some that they showed secondary, I felt were probably more primary. So, it's somewhat subjective.

But at any rate, that's the difference between primary and secondary.

But both of those impact what are you doing by this change.

Now, that's a very good question that you ask about what's the safety significance of these.

Let me give you a few examples.

I think we did to the ACRS, we picked a few, but

I'll just pick some.

There are many changes that are listed as improved safety that relate to changes in containment examination of IWE and IWO, which happens to be one that the Commissioned recognized and mandated in their original proposal; they were making it mandatory. So, that's one, and there's many in there.

The second one which is significant -- also, there's several there -- relates to Appendix VIII, the ultrasonic testing performance demonstration, and there are further enhancements.

In fact, one of the concerns we had was when the Commission first proposed to impose that, we were concerned that we were in the process of doing a pilot plant of verifying that what we had in the code was reasonable, and we were making changes. So, we hadn't yet optimized Appendix VII.

So, we were worried that what the Commission was trying to impose was going beyond what was reasonable, so many changes there.

That's also another one that the Commission proposed to mandate.

So, that's another category of safety significant.

Other examples of improved safety include changes to provide, say, supplemental qualification, requirements

for UT personnel to improve the UT examiner's skill. That's another category.

As we're moving into greater technology and we're looking for more finite things, we need to make sure that the technician's knowledge and experience and expertise and repeatability is there.

So, that's one that had a big impact.

Also, adding requirements for the application of Appendix VIII flaw sizing to vessels less than two inches in thickness and on components other than those identified in Appendix VIII's scope is another safety significant one, which I might say was issued in the code after the 1995 edition. So, it may not be in the current regulation, but that's a significant change, and with it goes refined UT techniques that weren't known 20 years ago.

Another example that are important to safety are in the comprehensive pump testing that I mentioned in the O&M code, and also, condition monitoring of valves is another one that's safety significant, and all the work that was done on MOVs, motor-operated valves, we worked with the Commission on that one, and also, in the O&M area, on service life requirements for dynamic restraints. So, that's another safety significant one.

So, those are some examples of what we mean by those 15 -- there's 15 total, is what I've listed, you know,

really 13 primary, and then there's two secondary ones for improved safety.

COMMISSIONER DICUS: Okay.

MR. PERRY: And the reduction in radiation requirements -- there's a lot more, and of course, many of those, you know, have a safety ramification, because as you can reduce the radiation exposure and being able to do things more quickly or expeditiously in a radiation environment, that's also a burden reduction for utilities, as well, enhances their outage time.

COMMISSIONER DICUS: So, the improved safety ones are throughout the rest of these or they're separate from them?

I mean improved safety -- that would be improved industry standard or reduced radiation exposure, or they're strictly in a separate category.

MR. PERRY: Right. All I tried to do is give you examples of the ones that the committee had classified as improved safety.

COMMISSIONER DICUS: Okay.

I'm not sure I'm real clear on that, but we'll drop that for the moment, for the sake of time, and let me go on, then, finally, to the ACRS, and I want to pull two statements that you've made.

You have stated that all three options presented

by the staff would maintain an acceptable level of safety, I believe.

Is that correct?

DR. SHACK: Yes.

COMMISSIONER DICUS: Then, statement number two, the staff has stated that there are some plants that are applying code provisions that are 17 years old, they're actually the '83 edition, without any adverse safety impacts.

Now, you touched on this in your presentation, but to me, those two statements begin to fight with one another. Would you like the opportunity to comment on that?

If we're using '83 standards and it's safe enough, but then we have three options here that would be okay, too, what kind of advice are you giving the Commission?

DR. SHACK: You know, they're safe enough in the sense that, if you do the analysis, that you can -- you know, pipe breaks are not -- you know, the system is designed to handle that, and so, from that point of view, they're relatively low-risk, and you know, you can say you're maintaining safety because of that.

If you really want to reduce the possibility of pipe failures and pipe leakage, then you know, I think that an effective inspection program adds to that.

And that's, you know, one of the arguments I would

have with NEI, that Appendix VIII, to me, is perhaps the most technically significant of all the improvements that have been proposed in the code over the '89 edition, the performance demonstration.

And it really comes down to the fact that, you know, you have to really be able to demonstrate that you can find the defect that you're looking for, and you know, the staff, ASME, and ACRS all find that important.

And yet, you know, that's the one particular element that NEI has singled out as -- you know, they don't like that addition to the 1989 demonstration and, you know, should be subjected to a cost-benefit analysis.

Well, again, for a low-risk system, it's difficult to defend defense-in-depth on a risk basis.

COMMISSIONER DICUS: Okay.

DR. SHACK: It's just the wrong -- it's the wrong metric to use in this particular case.

COMMISSIONER DICUS: But it's difficult -- I guess what you're trying to tell me, if a plant, a licensee is using a very old edition of the code and it's working okay but they ought to do better, it is difficult to make a cost-benefit analysis.

DR. SHACK: Yeah. And you know, I would -- you have to look at particular cases.

I suspect that, in most of the cases, when the

plant is using the very old code, they're probably doing inspections for cause, you know, on significant things.

You know, if they have stress corrosion cracking in their boiling water reactor, then, you know, you're only using the ASME code sort of where you haven't really identified a particular mechanism.

You know, there are augmented inspections wherever we know there's an ongoing identified mechanism of degradation.

The ASME code is where we really haven't identified a particular mode of degradation; we're just trying to assure ourselves that there are none going on.

COMMISSIONER DICUS: Okay.

DR. SHACK: You know, it's looking ahead. It's anticipating.

COMMISSIONER DICUS: I'll stop here.

Thank you.

CHAIRMAN MESERVE: Commissioner Diaz?

COMMISSIONER DIAZ: Yes.

I want to do the same I did the other day and going to essentially be the same question for everybody.

Let me start with a small statement, Mr. Chairman. I like small statements.

I think everybody agrees that there is a significant importance on maintaining regulatory stability

and stability of the implementation of that regulation in the power plants. I think everybody agrees with that.

I think where there is agreement is what is meant by that regulatory stability and implementation.

I think I hear argument for maintaining that stability be state-of-the-art processes, things that are, you know, with a certain frequency, brought up to what the state of the art is, and what stability could also mean, that, you know, we maintain what is already working.

I think that is really an important issue. Do we really obtain more stability and better, you know, safety by upgrading to state-of-the-art requirements or by maintaining what already exists?

That's one question.

What do we really mean by stability of the processes and do we mean, you know, maintaining what is working or do we mean really that the process of adopting a code and updating it with, you know, 10-year frequency -- is that stability, you know, and I'd like each person to answer that question.

And the second part of the question is on the issue of cost that has been already addressed.

Is the cost really inclusive?

You know, has anybody looked at the cost as it would evolve from the standpoint of exemptions or, you know,

small events might not be detected if you don't have the state-of-the-art, the latest, you know, ISI and IST code available and all of the improvements?

Is there really some balancing that comes in the issue of cost that might be hidden from us at the present time?

Two parts, regulatory stability, implementation stability, and cost as an all-inclusive consideration.

MR. BEEDLE: Let me start out, then, with a comment on the regulatory stability issue.

In '91-'93 timeframe, we had a utility that did a review of the ASME code, submitted a cost-beneficial license proposal that was well founded, well studied, clearly demonstrated that the -- while the ISI/IST program was important to us and we recognize that and we're not suggesting for a moment that we abandon that but to continue to update based on where we are today was not particularly beneficial or useful to the industry, in view of the cost that's incurred in that process.

Now, that's '93.

Here we are in the year 2000.

So, I would suggest that we haven't had well-founded regulatory stability in this area since then.

COMMISSIONER DIAZ: We'll call that stability, because it hasn't changed.

MR. BEEDLE: Maybe you're right.

COMMISSIONER DIAZ: And that's the point.

MR. BEEDLE: Good point. Regulatory stability but perhaps a lot of anxiety and frustration in the rest of the industry trying to resolve and deal with those issues.

COMMISSIONER DIAZ: The present frame of year 2000 is the one that I'd like.

MR. BEEDLE: And we certainly support that.

COMMISSIONER DIAZ: Okay.

MR. BEEDLE: The issue of cost --

COMMISSIONER DIAZ: I'm sorry. State of the art or not state of the art?

MR. BEEDLE: Well, I see the state of the art gets embodied in the process of going through these consensus standards, and we have many of them.

We have encouraged the development of standards on fiber-optics.

We have encouraged the development of standards for a number of areas where we see a clear advantage to improving processes and procedures and systems as a result of employing this improved technology, and once we get those standards in place, then we employ those either in the revision modification or adjustment of our systems.

So, I don't think that this process has been negligent in incorporating advances in technology. In fact,

I think it has encouraged it, and we've used that process to foster the development of standards for the use of the industry.

COMMISSIONER DIAZ: Okay.

MR. BEEDLE: Cost. I don't want to leave you with the impression that cost is the only issue in here. It's cost versus what benefit you gain.

Now, I am not trying to head to head with Mr. Perry on what changes were made in the code, but let me just give you an idea of what we were looking at in terms of cost and what we were looking at in terms of benefit when we take a look at the 1989 edition versus the '92 edition for ASME code.

We did an evaluation of those two codes, and there were some 84 changes between those two code revisions. Seventy-seven of them were editorial. Eight were errata. There were 52 changes that did not make any change in requirements whatsoever. Twenty-two of them reduced requirements, and some 25 had an increase in requirement, and none of them were safety significant. So, even if we spent $100 making those kind of changes, I'm not sure it would be cost-beneficial.

So, that's not to say that the code doesn't advance with time, but we haven't had safety-significant issues come out of these codes, and if they were, our

generic process within the regulatory framework doesn't go to the code issues; they solve them through other mechanisms.

So, I'm not sure that I could satisfy in my own mind or in the minds of my members that the codes are necessary to the safety of the plant.

They enhance safety, no question about it. They codify processes, no doubt about it.

They incorporate new technology and new techniques in the testing and inspection of the programs, no doubt, and we incorporate those whether they're required by the NRC or not.

COMMISSIONER DIAZ: Okay. Thank you, sir.

Mr. Perry?

MR. PERRY: Yes.

To answer the first part of your question relative to regulatory stability, I submit that, up until this proposed change, the process has been such that there has been a requirement to update every 10 years to the latest ASME code, and it was mandated, and again, we're talking about maintaining pressure boundary integrity and operational readiness of mechanical equipment, which is quite critical to the success of health and safety, and in that process, I think that we've seen some changes in practice over the years, and I'll give you one illustration

of one that I had personal experience on.

I was in the nuclear business for over 40 years, and one of the jobs I had was executive at a nuclear utility during the design, construction, and operation of the plant, and we were in an outage at the end of a 10-year interval, and we were looking to make sure we met all the requirements, and lo and behold, we found there were many cases where we had not met all the 10-year requirements.

So, we committed to the NRC to do all the requirements before we restarted, and the deeper we dug, the more we found, and what had happened at this utility was that the work was done by an ISI group; they hired a consultant to do all the testing.

This is a B-31 plant.

Many of the welds that they tried to inspect were never ground.

They were never designed to be UT'd; they were PT'd and x-rayed.

So, what the consultant did -- they just wrote on a little report, not prepped for UT, and the utility person threw it in a file.

When we came to the end of this, when QA got involved, we found all these had not been done. We also found many other errors in how we interpreted the requirements, mis-interpreted, and had to make adjustments

and refinements to get this done.

Now, that was an assessment that we did as a utility, got that all squared away, took a lot of effort and many man-months, down time, during a period of time when NRC used to have NDE trailers to go in and do their own inspections.

They don't have it now.

So, the utility -- the NRC has backed off now with respect to the involvement in some of these activities. We're relying more and more on utilities.

They're under a lot of pressure to keep the costs down.

So, I think they could consider this a dis-incentive to have to expend these additional dollars.

But to add to that, when I get to the cost aspect, it's not just the cost of making the update and the changes, but as I pointed out, if there's a disparity between what is baselined and what the latest code is, I can guarantee you that utilities are going to have to go in and get exemption requests to apply code cases that are not yet approved and other changes to make their program workable where they might have misinterpreted or done something wrong.

Each one of those requires additional effort on the part of the utility, additional staff effort on a one-by-one basis, and if you make this non-mandatory and

they pick and choose and cherry-pick and you say the staff is now going to decide whether they're doing it properly, I question whether all the staff members may be qualified.

The code is very complicated, and to just pick a portion out and miss something else that goes with it can easily happen.

So, when you talk about stability, I think we have the stability when you require the update, require everyone to standardize and make it uniform.

Now, in terms of the NRC looking at enforcing, they know what the requirements are; there's consistency for all the inspectors and the teams that go in there.

When each utility is doing their own thing, you know, if I were the inspector, I'd pull my hair out, saying, you know, what goes on, all these changes, and so, how it's handled between the region and how it's handled between headquarters becomes a major problem.

COMMISSIONER DIAZ: Thank you, sir.

Dr. Shack?

DR. SHACK: In terms of regulatory stability, when you say state of the art, the ASME code is a slow-moving conservative sloth.

I mean, you know, it's not exactly rushing to the frontiers, and I think the consensus process itself is a strong filter on things that, you know, although there's no

explicit cost-benefit requirement, these people are all in the field, you know, they have to implement these things, they have an intimate sort of day-to-day knowledge of what actually goes on.

And so, I believe that there's a very -- a good filter there for requirements that are not particularly -- you know, again, obviously, we correct editorial errors and such, but I think the true changes in the code really arise out of a consensus of people who are technically the most familiar with this thing.

And they're, again, acutely aware of what will happen when they actually have to try to implement these in the field, so that the thought that they're off -- you know, they're nerds advancing the state of the art, I've got a 800-megahertz Pentium now and, you know, I'm going to do something different, you know, it's just not the way it works.

It's a different sort of process.

So, I think, you know, stability, to my mind, is a process that's been working fine for 30 years, and you know, I haven't seen a good case to change it.

The cost -- you know, we -- at the ACRS, we only know what's been presented to us, and as I say, I haven't seen a convincing case that the costs are high either way.

You know, people cite ranges that go all over the

map.

There are obviously elements of costs on both sides of the equation.

As I say, our sort of judgement when we're all said and done was that it was hard to see a large net cost either way.

CHAIRMAN MESERVE: Thank you.

Commissioner McGaffigan.

COMMISSIONER McGAFFIGAN: Mr. Beedle, yesterday we renewed the license for Calvert Cliffs, and that was a major milestone here.

If Watts Bar gets a renewed licensing, it will be operating in 2055 -- I think it got its license in '95 -- and I assume it was licensed -- it was a long process, like many of the post-TMI plants, but it's probably licensed to the '83 or, at best, '89 version of the code.

Under your recommendation, they would never -- they would be operating in 2055 to the '89 code, perhaps cherry-picked, as Mr. Perry said, with addenda since then. Does that make sense?

I mean could you operate a plant in 2055 to a 1989 code that would be able to buy spare parts? Wouldn't they have to update?

MR. BEEDLE: If the major elements in revision to the code are editorial in nature and not safety significant,

then I don't see any problem.

COMMISSIONER McGAFFIGAN: Take us to the next point.

I mean you compared '89 and '92, and I assume that must have been in the Entergy rule-making package that you referred to, and I'm not familiar with that, but we're talking 10-year periods here, we're not talking three-year periods, and Mr. Perry is making the case that, over a 10-year period -- and ACRS is heartily agreeing -- that there were some -- and I think the staff heartily agrees on this Appendix VIII -- there were some significant improvements to the code over a 10-year period, and since -- you know, I think the analysis has to be, you know, comparing one piece of the code to what it was 10 years previously rather than to -- maybe Mr. Perry would agree that the '92 versus '89 wasn't a big deal.

MR. BEEDLE: Well, I think many of the beneficial changes in the code have centered on our testing techniques and how you do the inspections.

I think if there was some analysis done by ASME in developing codes that concluded that our vessels and major structures were -- needed to be upgraded, then I think we'd be handling that in a different process than an update to the code.

So, I don't think that we're dealing with a

necessary updating of the code in order to ensure safety of the plant.

I think that that's going to happen through the regulatory process.

COMMISSIONER McGAFFIGAN: Mr. Perry makes the point that, if you don't update the code in a holistic manner, an integrated manner, and you allow this cherry-picking, as he calls it, to go on, that that may prove to be more burdensome both to the staff and for the industry, because the exemption cases cost more.

Do you have any comment on that?

MR. BEEDLE: Well, I don't know that that has been a major issue over the last 15 years.

We've updated the code several times where the utilities have encountered the 10-year ISI update process, but in the interval, we've had numerous examples of exemptions necessary to improve techniques for inspection in the ISI/IST program.

So, that's happening even if you decide to have a requirement to update this code every 10 years.

I don't remember the exact description that Mr. Shack used for the ASME code, but when you update this every five years, I mean you have to have seen some changes in the code cases in that interval, and we certainly aren't going to wait for five years if we see some beneficial use of some

of those code cases.

We've got to figure out whether or not this is really something that's essential to safety or not. I think that's where we've got come down on this.

COMMISSIONER McGAFFIGAN: Mr. Perry, did you want to say something?

MR. PERRY: I would like to submit that I think that what we're talking about on these exemptions was a case of the NRC having endorsed the 1989 edition of the code and now we're at 1999 that they made the change.

So, during that interval, there wasn't an endorsement of the later code, and secondly, ASME has deliberately tried to maintain code cases to make it easier for the NRC to endorse those by reg guides, and even those lag behind, that's what's forced these updates.

But if you look at it in the future -- let's say the 1995 edition and 1996 addenda, which is currently in the regulation -- that's frozen, and now you move forward to 2055 -- there's going to be a hell of a lot of enhancements in things.

All of these are going to be done by code case or exemptions or what have you, and those are very costly. It's costly for the utilities not only to do it but to submit it to the staff and then answer their questions back and forth, it's expensive for the staff.

I submit, if you're able to divert your resources more on updating to the later codes and a quicker endorsement of the code cases, you do the analysis once, now all the utilities can implement this, you don't need all of those special approvals.

So, that would be a burden reduction, first class.

COMMISSIONER McGAFFIGAN: Mr. Perry, one of the points you make is the potential loss of interest on the part of the industry in participating, and you cited in passing -- and it's not something I'm familiar with -- the problems you're having with NQA in getting the staff's attention to a submission in '97.

I know it's not the subject of today's meeting, but could you just tell me in passing what that is and why you think it's safety significant?

MR. PERRY: Yeah. That one may not be safety significant, but again, I think that there are significant changes in the NQA-1 standard, 1997, that's performance-based and put the emphasis on the right things that picks up lessons learned and experience and key things that I know the Commission has expressed an interest in, and yet, they're reluctant to come out with a reg guide endorsement, because they say -- and I haven't seen the utilities beating down the bushes saying they want to change it, and things like configuration management --

COMMISSIONER McGAFFIGAN: That's a case of loss of interest on the part of both the utilities and the staff, you would say, in that case.

MR. PERRY: Yeah. So, we're pursuing it through the utilities and getting them to come to the Commission and say, now, here's what we would like and why, but what's the Commission's position on this?

COMMISSIONER McGAFFIGAN: The final issue is the backfit issue, and this gets to this integrated issue.

We have before us -- and you guys haven't seen it. We've got a paper on fitness for duty, where we're dealing with a morass of things in looking at -- I think it's 28 or 31 worthwhile exceptions to the backfit rule which might pass a -- don't pass the substantial benefit test but maybe pass a worthwhile benefit, you know, cost -- benefits greater than cost.

If you look at this as a whole -- and I guess I'll direct this to Mr. Shack -- what is your best guess, if you get rid of the -- the backfit rule doesn't apply here, but if you apply a cost-benefit test to continuing the code requirement -- you know, Mr. Perry has already answered -- would there be more benefit than cost?

Get rid of the words "substantial benefit." Would there be more benefit than cost to continuing this requirement?

DR. SHACK: You mean if I compute the cost per the 109 guidelines, by the standard regulatory analysis.

COMMISSIONER McGAFFIGAN: The standard regulatory analysis stops at the substantial benefit test and doesn't get very far, and that's the problem we're facing in this paper. A lot of things don't pass the substantial benefit test. They might pass a cost-benefit test.

So, you know, at the margin -- you know, 50.109 doesn't just have cost-benefit in it; it has a substantial benefit before you even go to cost-benefit.

So, get rid of the substantial benefit test and then go to are the costs, on balance, less than the benefits or more than the benefits?

DR. SHACK: This is one of those where it's very difficult to calculate the benefits.

I mean you're sort of pushing the limits of your technology.

You know, how much is an improvement in in-service inspection a benefit, and that's very difficult to quantify. I suspect I can skew cost-benefit analyses within my uncertainty range.

COMMISSIONER McGAFFIGAN: Okay. I'll let you off.

CHAIRMAN MESERVE: Mr. Merrifield.

COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman.

Mr. Perry, you talk about a variety of different

things to hammer out.

You raised a concern that if we did not have a requirement to do these updates that there may be less interest on the part of industry.

I guess my question is this:

Does it change in the end if industry is aware that those provisions are voluntary?

Does that change the dynamic for how the participants are going to be engaged in the process of developing their roles?

MR. PERRY: Absolutely.

COMMISSIONER MERRIFIELD: And how might that change?

MR. PERRY: I think that the individuals who participate in codes and standards are middle-level to worker individuals who are technically knowledgeable of the subject or intimately involved in implementing these things, and they have to have approval to participate and get support from their companies as the NRC representatives has to have budget to do it, and if they're told this is no longer mandatory, they're saying, well, we don't have to do it, so it's not required, I'm going to reduce my cost, so I'm going to just withhold participation.

We've experienced -- and I don't think this is uncommon.

We've experienced reductions in volunteers as industry -- the nuclear industry shrunk and as competition became greater.

They tightened the belt.

We've also experienced attrition due to older mature people retiring and not -- the utility saying I'm not going to replace that person, I'm not going to continue to support the code like I used to.

So, it's a struggle to maintain good volunteers, but besides the effort of the volunteers, there's research that goes on to back up a lot of these.

I can guarantee you that performance demonstration, the involvement of EPRI and industry and the utilities was tremendous.

So, it's not until a lot of that's done that we try to codify that.

That's going to be lost. There's no incentive to do the research.

Who's going to fund it?

So, I think there's a big difference, and I submit, I think the same thing is going to impact the NRC.

They're going to say -- you know, the individual manager says my budget's being reduced, what can I cut out? Well, let's cut out travel.

Where do you go? Well, you go to these code

meetings.

Well, do we have to go to all of those?

So, I think it's going to have a negative impact, and the mix is going to be different.

I submit that what you'd probably concentrate on is code cases, not revisions.

COMMISSIONER MERRIFIELD: Mr. Beedle?

MR. BEEDLE: I think, clearly, there is financial pressure in the operation of these facilities, as the environment changes.

I don't think that it means that the industry is going to abandon the development of codes and standards that are necessary for the safe, efficient, and effective operation of these facilities.

We see significant involvement with the NSSS vendors.

We see involvement with ASME.

We see involvement with ANS.

We see involvement with EPRI.

Now, whether or not those change with time, I think it's going to depend on whether or not there's any benefit to be gained from them.

If the utilities can gain through ASME, then they will use ASME process.

If they're going to gain through the NSSS vendor

groups to solve their technical problems, I think that's where they're going to go to solve them.

So, it's really is there a benefit to the utility in participation?

That's really going to be the test.

COMMISSIONER MERRIFIELD: You've repeated that theme a variety of times, saying beneficial to the industry, and I'll be honest, that troubles me.

Through what lens are you calling beneficial to the industry?

You know, here we have various pillars we use to determine our regulatory basis for moving forward on a risk-informed regulatory structure.

Those include reducing unnecessary burden, but they also envision using risk to make a better definition for where we're going on a regulatory basis, and that means sometimes reduce unnecessary burden and sometimes increase burden based on risk.

We also have the pillars of public confidence, and I guess -- it strikes me -- you know, a sort of devil's argument you could make is, if you set a 1989 baseline standard and anything above and beyond that is voluntary on the industry, and if you use that beneficial-to-the industry standard, what you have is a one-way ratchet.

Those cases in which you can reduce, you choose,

you reduce that unnecessary burden, and those which would have some increase in costs, you wouldn't.

I mean under what basis under a strictly voluntary system would industry choose -- how would it determine a benefit if it's going to be an increased cost?

MR. BEEDLE: Well, we -- I think we've got a number of examples in the regulatory framework where the industry has been -- has addressed safety issues, at the behest of the NRC, totally outside the framework of the ASME process.

So, if the ASME was identifying safety issues that need to be addressed by the industry, I think we'd be addressing them.

So, I mean it's not a matter --

COMMISSIONER MERRIFIELD: Even in the absence of the NRC saying it meets the backfit test and we're going to make you do it.

MR. BEEDLE: Commissioner, we've got scads of codes and standards out there that govern the way we do business, in a lot of cases, that are not mandated, updated every 10 years, and we end up going through a process that gets those things in place.

The desire to not have a regulatory requirement to update every 10 years does not mean that we're abandoning a process that gives us some standardization in inspection and

testing of our systems.

That's not what we are after.

COMMISSIONER MERRIFIELD: I didn't know whether Mr. Perry or Mr. Shack wanted to make a comment relative to that. Yes, no? Okay.

We've got to move forward.

I guess, Mr. Perry, we touched briefly -- you said that there are states that require the ASME code outside of our process.

If you could share with me and the other members of the Commission which are the states that do apply those independently, that would be helpful, as it relates to non-nuclear facilities.

MR. PERRY: I don't have the answer, but we can --

COMMISSIONER MERRIFIELD: If you can provide that at a later date, that would be helpful.

Thank you, Mr. Chairman.

CHAIRMAN MESERVE: I would like to thank the panel. I very much appreciate their participation this morning, and let me call the staff to the table.

MR. MIRAGLIA: With me today, we have Brian Sheron, who is the Associate Director for Project Licensing and Technical Analysis in the Office of Nuclear Reactor Regulation; Jack Strosnider, to my left, is the Director of the Division of Engineering in NRR; and to Jack's left is

Tom Scarbrough, Senior Mechanical Engineer in the Mechanical and Civil Engineering Branch in NRR.

Brian?

MR. SHERON: Thank you.

Actually, I guess the first slide is just some background.

I think that's already been discussed. So, I'd like, for time's sake, to skip maybe to the second one, current ISI/IST updating approach.

A lot's been said already, so I don't want to repeat.

What I would like to do, actually, is clarify what we are -- what the staff is proposing. We are proposing that we baseline the endorsed edition of the code that is required, the 1995 edition.

Our plan right now -- and we have resources already identified -- is that we will be endorsing probably every year the latest addenda to the code that come out, and then, every three years, we would endorse, hopefully within a year or two of its issue, the latest edition of the ASME code.

We are saying we would endorse it, which means that utilities would be allowed to use it, okay, but it would not be required.

As we do that review of that code or the addenda,

we will be subjecting it to the criteria in the backfit rule, 50.109.

If we believe that there are improvements in the code, okay, that are important and substantial increase in safety and pass the backfit test, we would go forward and backfit them as a requirement, and we would anticipate that we would backfit them to be implemented at that time, not wait 10 years.

My personal feeling is that, if the code improvements are, indeed, substantial, we will probably be putting in requirements more frequently or requiring plants to update more frequently, perhaps, than even is required now.

A plant can wait 10 years before it has to update, depending upon when a code is endorsed and what the latest endorsed edition is.

As you see, we have plants -- we have five operating on the '83 edition, we have 18 units at the '86 edition, and we have 81 units with the '89 edition.

We would probably look at, as I said, each edition of the code, we would pick out those areas that we believed were substantial improvements to safety, and we would require them at that time.

So, we would not be basically saying everybody must update to a complete edition of the code, but where

there are areas where there are substantial improvement, we would require those.

After some period of time, my guess is that, if we see that there is a substantial improvement in the overall code, then we would probably come forward and say we would anticipate backfitting the entire code.

We do have guidance from the Commission back in 1993, actually, on backfitting against 50.109 for codes and standards, and this is contained in the CRGR charter, actually, and there is very specific guidance, but basically, what that guidance says is that we can use qualitative arguments to meet the substantial improvement in safety criteria of 50.109 with regard to standards, codes and standards.

I'm looking at Revision 6, which is the April 1996 charter, but there is words here that says we can use qualitative arguments to require backfitting to codes and standards.

So, we believe we have sufficient guidance and sufficient ammunition, I would say, in order to backfit codes and standards if we see there is a substantial improvement.

We are not proposing cherry-picking. We have said that, when a utility would update to a newer edition of a code, whether it's endorsed or required, they would be

required to update to the entire edition, okay?

It's not a matter of just going in and saying I want these pieces that are beneficial to me but I'm not going to take that stuff that puts more requirements on me.

If you want to update to the new code, you do it in its entirety.

Now, just like is allowed today, if a utility wants to take exception to some of those requirements, there is a process they can do that, okay?

They can request reliefs from the NRC staff, which means we go through and we do a safety evaluation as to the acceptability of that relief, and we write them a specific approval.

So, they cannot cherry-pick without the NRC specifically approving whatever it is that they're asking for.

Our process right now -- we don't endorse the addenda through code cases -- I'm sorry -- through our reg guides, okay?

Right now, if we endorse any new code cases or anything, it must be through a rule change.

It's a little torturous, but we have a footnote in the bottom, in 50.55(a), which talks about a reg guide -- 1.84, I think it is. Is that right?

That reg guide endorses the code cases, but in

order for the industry to use them as part of an approved rule, we have to change that footnote in the rule.

I would also point out that the -- with our risk-informed option, which we have approved -- we have two approved versions, I think, ASME, a Westinghouse approach to risk-informed ISI and IST, and then there's also an EPRI one, which we've recently approved.

They don't specifically require any 10-year ISI updating, okay?

In other words, what they require now, I believe, is, after 10 years, they have to go back and take a look and see whether there's anything that needs to be changed, okay, but there's no mandatory requirement.

So, if a plant actually goes to the new risk-informed approach, they would not be required to update every 10 years.

The only other point I would want to make is that -- just from our experience.

We participate on numerous codes and standards committees in NRR as well as the rest of the agency, and I think, as Mr. Beedle said, many of those are voluntary in the sense that we don't require the use of that code or standard.

An example that comes to mind is IEEE 603, which is basically the replacement for IEEE 279. 279 is required

in 50.55(a).

When we endorsed that, 603, we did not make it mandatory, okay?

We said that it was an acceptable alternative to 279, but it was not mandated.

I am just not aware that there has been any decline or decrease in participation in IEEE standards committees, because we are not requiring, you know, revised IEEE standards, as an example.

My feeling is that, if the NRC continues its participation on ASME code committees, which we fully intend to, regardless of whether we drop the requirement or not, the industry is going to have a vested interest, I think, for a couple reasons.

One is they're going to want to make sure what we're doing on there, and we're not putting in a whole bunch of new requirements, and second, I think, is that, if there is new technology coming along -- and a lot of it is all designed to make life easier, okay, better inspection methods, easier things where they can inspect, get less radiation dose -- I think there is a real desire, okay, on the part of utilities to continue to participate.

So, I guess I don't feel as strongly that there is going to be a tail-off in participation, just because we move forward with this approach.

So, I think that kind of wraps up my summary of where we are in terms of what our actual proposal is, and I would just reiterate, we are not proposing that we're going to stay on, for example, the 1995 or 1989 edition of the code for the next 20 or 30 years.

I would anticipate that we will be having required backfits if there are safety improvements made to the code, probably within, you know, three, four, five years, and that probably, perhaps, you know, within 10 or 15 years, we may look and we may decide that there's enough improvements that we should backfit the entire code.

With that, Tom, I don't know if you want to run through your slides real quick.

MR. SCARBROUGH: Yes. Thank you.

My first slide has the milestones, but I just would like to point out on this slide that we did hold a public workshop with about 60 participants and obtained quite a bit of information in that, and I'll just move right on through that.

The next slide are the options, and you've heard those this morning.

We are proposing option 1B, which would establish the 1995-96 code, as incorporated in the September rule, and I'll just go on to the next slide.

We evaluated the options using the four

strategicals of maintaining safety, increasing public confidence, reducing unnecessary burden, and making NRC activities more effective, efficient, realistic.

With regard to the first goal, maintaining safety, each option will maintain safety by requiring updating of ISI and IST programs based on its specific criteria for that option.

For example, option 1 would include a quantitative and qualitative analysis using the provisions of 50.109 to determine when updating is necessary.

Option 2 would continue to require the automatic updating, and option 3 would require updating unless the licensee demonstrated that its program provided an acceptable level of quality and safety.

We agree that the '95 edition of the code includes many improvements, and we have heard many of them this morning.

Option 1 will continue to maintain safety also by endorsing future code editions for voluntary use and requiring updating when necessary based on the provisions of 109.

We also will maintain the importance of the code by more timely endorsement of the code editions for voluntary use or mandatory use.

And finally, we agree that the updating process

does provide a means of assessing program adequacy and that the voluntary and mandatory updating that will occur will allow this to take place.

Next slide, please.

With regard to the second goal of increasing public confidence, we believe option 1 will increase public confidence by applying the provisions of 50.109 to updating, consistent with the other new requirements for operating reactors.

Option 2 may also increase public confidence by requiring updating to the latest endorsed code editions regardless of safety significance.

Option 3 would retain the update requirement but may decrease public confidence by the limited participation provided in the approval of alternatives that would be proposed by licensees.

Next slide, please.

Regarding the third goal of reducing unnecessary burden, the cost of updating an ISI/IST program can range from 200,000 to over a million dollars per plant. We heard that this morning.

Under option 1, licensees would only be required to update their programs when the code improvements are sufficient to satisfy the 50.109 provisions.

However, regardless of the decision on the update

requirement, licensees' cost associated with submitting a relief request will continue as licensees customize their ISI and IST programs to best fit their specific plants.

Overall, we consider option 1 to provide the greatest flexibility for licensees to minimize their burden in implementing an effective ISI and IST program.

Next slide, please.

Regarding the fourth goal of making NRC activities more effective, efficient, and realistic, we plan to improve the ISI and IST updating process under option 1 by more frequent endorsement of new code editions by applying dedicated resources and revising the regulations.

Option 1 would also provide a consistent application of 50.109 to ISI/IST updating, similar to other new requirements.

Because the staff will continue to review future code editions for endorsement and to review future relief requests, we do not believe that any particular option would result in significant NRC resource savings.

Next slide.

Further, on that same goal, we are encouraging licensees to develop risk-informed ISI and IST programs and also ASME to establish initiatives that might improve the long-term approach for implementing those programs.

We will continue to participate in the code

process to help ensure that risk-informed initiatives are successful.

With the customized ISI and IST programs currently in place at individual plants, we do not believe that modification of the updating process will significantly affect the range of code editions applied at each plant.

Finally, any inconsistency that might arise between NRC and state positions would be resolved by Federal preemption.

Next slide, please.

In conclusion, we believe that option 1 best addresses the four strategic outcome goals, and we propose the 1995-96 code as the baseline, because it is the most recent version endorsed in the regulation, and it does include a number of improvements since the 1989 edition.

I'll be happy to answer any questions you might have on our presentation.

CHAIRMAN MESERVE: Thank you very much.

As I understand the -- I'd like to have you address the regulatory problem that you -- others have argued that you create for yourself by this proposal.

The suggestion is maybe, as I understand your proposal, perhaps as long as till 2055, there would be a -- what would be applicable would be the 1995 edition of the ASME code, with segments of provisions drawn from successive

codes that would be added in over time, so that, to the extent that the ASME is trying to develop a unified inter-related code by the process you'd involve, what you'd require would be chunks of things that wouldn't be unified.

With licensees, if they want to get the benefit of updated codes, come in and are required to take the entirety of an updated code, so they have an entirely different set of requirements than what you would otherwise require, or at least to the extent that the ASME code is changing over time, which, as we've heard, might be significant over a period of many decades.

I just wonder whether you've -- you're not creating a nightmare for yourself in evaluating plants and in doing inspections with the fact that you have just chunks of things drawn from various places that you're inspecting against with many licensees perhaps deciding they want to use updated codes, which could be several decades newer than the baseline, and just -- you're creating an inconsistency between plants, or among the plants, that seems to me just greatly aggravates your problem of conducting your work, and I wonder if you could comment.

MR. MIRAGLIA: Brian addressed that to some extent, but in terms of -- I think what we have to recognize is we looked at where plants are now with respect to codes and the exemptions that are required and consistent with the

code changes.

We essentially have a number of customized plants out there.

Brian also alluded to the fact that, at some point in time, as these changes became significant in large numbers, that there would have to be perhaps some codification to say that the '95 update should be codified to some greater extent, and Jack's had numerous experience in this, so I'll let him give you the details.

MR. STROSNIDER: This answer may not be totally satisfactory, but I've dealt with this issue from headquarters and from the regional perspective. In fact, I supervised the NDE van that was mentioned in some of the earlier presentation.

The situation you're describing exists today, and I say that that may not be very satisfying to hear that, but the fact is, as we indicated, we have plants out there that are operating with codes back as early as 1983.

Headquarters, in NRR -- we process about 300 relief or alternative requests a year, okay, and the outcome of all that is that basically the ISI programs at the plants are pretty much tailored to those plants, and when the inspectors go out to look at them, it's very unlikely that there's any two of them that look the same, and I say that may not be very satisfying, and you say, well, how can I fix

that situation, and I'm not sure that there's an easy solution to that.

Certainly, requiring updates every 10 years, depending upon when a plant was licensed, is not going to provide that kind of consistency, okay?

Understand that, you know, that 10-year update occurs at different times for different people, they would be addressing different codes, and as they look at the more recent edition of the codes, they will -- if they see something that's beneficial, they will request to use that through the alternative or relief provisions of the code.

Similarly, we backfit -- we have required issues be implemented -- or code activities be implemented on an accelerated basis, depending upon the significance.

There was a lot of discussion this morning about Appendix VIII, performance-based qualification of NDE, about IWE/IWL inspections for containment.

Those provisions of the code were put through backfit evaluations by the staff, and we required expedited implementation of those, because they had significant safety implications.

MR. MIRAGLIA: Can I add to that, Jack.

In terms of the two issues that Jack just raised, those were raised as a result of operating experience.

The MOV issue was raised and the agency took

action to deal with the safety issue based upon operational research experience.

That need for a codification of a uniform or standard approach to address those issues were the impetus for IWL/IWE issues.

I mean there's a number of processes out here in terms of our regulatory processes that -- it's a mechanism for feeding the need for code requirements.

MR. STROSNIDER: So, the response that the ISI programs and the IST programs are these plants are somewhat plant-specific, somewhat tailored to the plant based on their age, based on their design -- it may not be totally satisfactory, but that's the case.

If we could come up with a way to make it totally consistent, you know, we'd do that, but I'm not sure that there's really -- that that's really practical.

But as I did point out, maintaining 120-month update provision or -- it's independent of whether you have that provision or not.

CHAIRMAN MESERVE: But doesn't the proposal as you've described it aggravate the situation in the sense that there is this 10-year update requirement, and it may well be that there are people at various stages in -- when the update requirement triggers, but at least you're dealing with a set of plants that are required to deal with a set of

codes that are reasonably contiguous in time, whereas what you propose would have -- freeze 1995 with segments -- unless you do a total recodification and can justify that through a backfit analysis -- that could extend on into the future, so that over time you'd have a situation -- you'd have even a greater disparity than you're observing today?

MR. STROSNIDER: The programs that we look at, that have been submitted under the current requirements -- 50 percent of the resources, 50 percent of the time in reviewing those programs is looking at alternatives and reliefs, where, in fact, the licensee may be updating to, for example, the '89 edition of the code that's saying, you know, I looked at a code case that was published in '95, '96, '97, I looked at something in one of the more recent editions of the code, and I want to use it, all right?

That provision will remain there.

Now --

MR. MIRAGLIA: The answer to the question, Mr. Chairman, I think, is what we're saying, everybody needs to re-baseline against, in the staff's proposed option, to the '95 with the '96 addenda.

What the reality is, is everyone would look at that and Jack would indicate there would probably be a number of exceptions or reliefs from that to permit plant-specific exemption requests because of configurations

in the plants, for accessibility of welds, and so, it would get everybody up to almost the same place, but with time, you're right, without another re-baselining, we would have -- and then we'd essentially be in the circumstances we are today with the current implementation.

MR. STROSNIDER: I'm not convinced that we would see a whole lot more relief requests and alternative requests than we currently see, because we see a lot now.

CHAIRMAN MESERVE: I'd like to ask you a question about your slide seven, which is -- as drafted -- you said it a little different orally -- is that option 1 was perceived to -- will increase public confidence by applying backfit, option 2 may increase public confidence, and I'd just make the observation that you've created a -- your proposal would create a barrier to updating through the sense that you have to do a backfit justification before applying the more modern ASME code, and it's not clear to me, particularly given the fact that we have an ACRS letter that's been submitted to us, that going to option 1, as you've described it, will increase public confidence.

MR. SHERON: I think "may" is a better word. I don't think we have anything that would say -- we're that positive.

CHAIRMAN MESERVE: As opposed to option 2 versus option 1, which one do you think would have the greatest

public confidence?

MR. SCARBROUGH: We were thinking there that, in this case, by being consistent, the consistency, so that it would show that the NRC is applying new requirements in an organized fashion consistently across the board for all new requirements.

MR. MIRAGLIA: I think it goes to everybody re-looking at the '95-'96 and making a conscious decision as to what applies versus not, and in the near term, that might have a little stronger, but I think, with time, "may" is probably the better word.

MR. STROSNIDER: But I do think one of the difficulties when people are looking at option 1 is they're reading as far as eliminating mandatory updates and they're not reading the rest of the proposal, which says, where there are safety significant changes that we can -- that we feel need to be implemented, that we will do that, okay, and you have to ask yourself the question with the current process.

If you have people operating to the 1983 edition of the code, if that were really the case, does that provide confidence?

In reality, okay, because of other backfit processes and generic letters and other things that we've done, those people are using -- those plants are using much

more recent things, but like I said, I think the important thing when we look at option 1 is not to over -- to lose sight of the fact that we are talking about implementing, mandating those aspects of the code, like Appendix VIII, like the containment inspection, IWE/IWL, not in 10 years, all right, but on an expedited schedule.

CHAIRMAN MESERVE: I'm misunderstanding something in what you're proposing. We currently require compliance subject to this 10-year update, and the current rule puts us to the 1995 code.

What we're considering now is the question of whether, for future -- whether that's every -- going to be amended every 10 years automatically or whether we apply a backfit requirement to this.

What I'm failing to understand is how, given the issue that's before us, how that's going to bring us to greater consistency among the plants than our current rule. I mean it seems to me that it doesn't.

MR. SHERON: It wasn't intended to --

CHAIRMAN MESERVE: I thought I heard you saying that that was one of the things, that we would benefit from this, it would bring everyone up to the '95 level. Well, that's where we are regardless.

MR. MIRAGLIA: I think it would say -- what the rule would say is that that would be the mandatory baseline

that everybody has to start from, and then they have to look at their programs versus that.

MR. STROSNIDER: It would bring them to a minimum level.

We're not suggesting that there's going to be consistency.

As I said earlier, when you look at the plant-specific aspects --

MR. MIRAGLIA: Some of them are probably already there.

MR. STROSNIDER: That's a very difficult thing to achieve, that sort of consistency.

CHAIRMAN MESERVE: Commissioner Dicus?

COMMISSIONER DICUS: Following up a little bit on that -- and perhaps you went into this, and if you did, I missed it or it wasn't that clear to me.

If we were to backslide, as the Chairman mentioned, which we're -- I don't think we're going to do that, but if we looked at the differences in the last 10 years in the codes, what number or how many of them reached the importance level that they would meet the 50.109 test?

MR. SCARBROUGH: The ones that we did were Appendix VIII, because when we endorsed -- when we were thinking about doing the endorsement, that was going to be accelerated. That was an accelerated implementation for

that in this most recent code.

So, we know that for sure, and so, that would be what we would consider something to be accelerated.

Now, we would have to look at -- there's been a lot of talk about the comprehensive pump test.

COMMISSIONER DICUS: Right.

MR. SCARBROUGH: We'd have to look at it more carefully and see if that might be one.

We didn't look at that at the time we were endorsing the '95 code.

The only one that really stood out as meeting the 109 test was the one on Appendix VIII.

MR. STROSNIDER: But I'd also point out that the endorsement requirement to implement IWE/IWL containment inspections, which was a separate rule-making, was also put through the backfit process and done not on a 10-year schedule but on an expedited schedule.

MR. SHERON: The approach right now -- I mean when we were reviewing codes for endorsement in 50.55(a), we obviously in the past have not been looking at them from the standpoint of the backfit rule, because we recognize that we said, you know, it doesn't apply in this case, therefore, we don't need to look at it and make that case.

Except in situations where there are substantial increases in requirements, new requirements, those have to

go through the backfitting process, and as you heard, we put those through the backfit process, and they, indeed, passed, and they were implemented, IWE/IWL.

COMMISSIONER DICUS: Okay.

MR. SHERON: So, to answer your question, I don't think we have looked to say, had we compared the '95 edition to the '89 edition, how many of those items, notwithstanding IWE/IWL and Appendix VIII, how many of those would have actually passed the substantial increase in safety test. We just haven't done that.

COMMISSIONER DICUS: Okay.

One quick question, because we are on a time crunch here.

It gets into the issue, if we did keep the rule as it stands, and every 10 years, or thereabouts, when there's an update, but in the meantime, if ASME identified something critical enough to bring to our attention, can't we go through the 50.109 process?

MR. MIRAGLIA: Yes.

COMMISSIONER DICUS: So, we can continue to do this, even if we keep the 10-year rule.

MR. MIRAGLIA: The IWL/IWE process is one to show that we didn't wait for the 10 years.

The other thing in terms of backfitting, you know, we keep -- if there is any safety issue that we feel needs

adequate protection, we can do that at any time, and the backfit is for enhancements issues, and so, what we're talking about here within the code is our role in that enhancement-type issue, perhaps a clarification in terms of what is required to comply with the code.

MR. SHERON: But I think what we're saying is that we don't really -- as I think Mr. Beedle said, okay, if -- a lot of improvements that were made in the code were basically editorial, okay, in nature, and the like, you know, and to have to have them translate that into their manuals and so forth and retrain their tech staff and the like, where you really can't identify a safety basis for it, what we're saying is we don't believe that's appropriate for the NRC staff to have to require that, okay?

Utilities can do that at their option, if they feel it's something they want to do, but we basically are saying we want to focus on those aspects of the code that enhance safety, okay, and those are the ones we will decide if it's necessary and then we will backfit them to be implemented, you now, and we won't wait 10 years, we're going to do it right then, okay, on an expedited basis.

CHAIRMAN MESERVE: Commissioner Diaz?

COMMISSIONER DIAZ: I think a lot of the things have been asked, but I just want to make a comment.

I don't think that editorial changes provide a

great burden.

I mean if they do, then there's something wrong in the process.

They provide a slight burden but not a significant burden.

I mean the burden is on those things that are really, you know, either safety significant or provide a change in the process.

Having said that, a quick question.

Are there improvements in regulatory stability and in consistency of the application of the regulatory programs by maintaining the 120-month upgrade?

MR. SHERON: I would answer -- and I think we touched on that -- and that is that, you know, as plants come into their update -- and I was just checking with the staff, and my understanding is that, if you plotted the anniversary date, okay, as a function of time, you would see basically a sine-wave moving through the system, okay, where there's a whole group of plants that got licensed around the same time. So, their anniversary date is around that time, you know, and then there's -- but there's tails, okay, that will have different anniversary dates.

But given that, combined with, as Jack said, that we get about 300 relief requests a year, which is about -- translates to about maybe -- what is that? -- three per

plant, okay, that each plant basically winds up with a customized ISI/IST program anyway, okay, and then we have a bunch of plants that we hope are going to start taking advantage of the risk-informed ISI/IST, which means they're going to move right out of that whole, you know, deterministic approach with the code and use a different approach, and they're not going to be in a 10-year program anymore.

So --

MR. STROSNIDER: I would add one other clarification here, just because I want to make sure it's -- give a fair evaluation of that.

There are some aspects of the code, such as the qualification of personnel -- and UT examiners was mentioned, okay, which that would be more uniform, all right, of course, and I would go back and point out again that that's another one that we captured with Appendix VIII, okay.

So, people -- you'd have more uniformity from that perspective.

When you talk about which actual welds you're looking at and that sort of thing, that consistency is difficult to --

MR. SHERON: That would be captured through a backfit, right?

MR. STROSNIDER: Yes.

COMMISSIONER DIAZ: It appears it might be a more fundamental problem with this issue than the upgrades in the codes, and with that, I yield the rest of my time, which is about five seconds.

COMMISSIONER McGAFFIGAN: The issue of -- the slide that the Chairman talked about, increasing public confidence -- I think you do have it entirely wrong.

I would just say that our European colleagues think we're sort of nuts to have a backfit rule to start with, and I think they backfit whenever they see a benefit commensurate with the cost, and they don't have the substantial benefit test.

So, the public -- and from my experience, the public interest folks and the CSAS process -- if you're talking -- if by "public," you mean David Lochbaum and Riccio and company, the backfit rule is not -- and the consistent application of it -- is not the first thing that leaps to their mind in building their confidence.

MR. MIRAGLIA: But it relates to and it grew from a concern by the regulated industry that we didn't have regulatory stability and that there needed to be a baseline from which to measure. So, I mean there's arguments on both sides of that.

COMMISSIONER McGAFFIGAN: To continue on this

backfit issue, Frank, you've been involved in the fitness for duty paper.

I don't know whether the other folks at the table are, but you've been involved in it, and you know how much work has gone into --

MR. MIRAGLIA: Yes, sir.

COMMISSIONER McGAFFIGAN: -- over five years or six years --

MR. MIRAGLIA: Yes, sir.

COMMISSIONER McGAFFIGAN: -- every provision of that, looking at whether it passes a substantial benefit test, coming to the conclusion that many of them did --

MR. MIRAGLIA: And that issue --

COMMISSIONER McGAFFIGAN: -- asking us for 31 worthwhile exceptions to backfit.

Aren't you setting yourself up in this to end up doing the same darn thing?

You're going to have to look at a complex code, you're going to have to look at it piece by piece, you're going to have to parse it, in the end the end the staff may -- the ACRS representative was saying you're going to have a hard time, you know, on a cost-benefit basis to justify some of this.

MR. MIRAGLIA: Well, I think --

COMMISSIONER McGAFFIGAN: It's a qualitative

argument.

I can imagine the future papers on the ASME code and a fitness-for-duty paper yay thick.

MR. MIRAGLIA: The only analogy that I would submit in that case is the fitness for duty and the application of the backfit rule have that commonality.

I think, in the code cases here, we have applied the backfit rule to implement changes in the code prior to the -- so, can we do it and is there a basis to make quantitative arguments?

I think we've demonstrated that in a number of instances.

In terms of the fitness for duty, the policy issue that came to the Commission is that the Commission had asked the staff to go back and look at the fitness-for-duty rule after two years of implementation and suggest changes. That came up, and the staff originally looked at the changes in an aggregate.

If you look at all of these changes and what the pluses and minuses, it would go forward.

COMMISSIONER McGAFFIGAN: With the fitness-for-duty paper fresh in mind and Brian Sheron's comment that, maybe in 15 years, we might want to endorse a code case in its entirety, I certainly don't want to be here when that paper comes to us, because I do think, if you --

MR. MIRAGLIA: Well, I certainly won't be here.

COMMISSIONER McGAFFIGAN: If the backfit rule is applied the same way to that process as it was applied to the fitness-for-duty process, God forsake the trees in the forest of this country -- God help the trees in the forest.

I'll pass.

CHAIRMAN MESERVE: Mr. Merrifield.

COMMISSIONER MERRIFIELD: Thank you, Mr. Chairman.

I have to say to Commissioner McGaffigan, this morning, in discussing this with my staff, I had the exact same reaction to the fitness-for-duty rule. So, you're not alone in that one.

I guess my one question for the staff is -- you know, we talked in the last panel and I asked some questions relative to what I would term the NEI benefit test.

You stated in your clarifications that, as you see it, you know, we're going to fix ourselves with the '95 changes, and then, as we go forward, 20 years down the road, if NEI or one of its members said, gee, we want -- we kind of like the 2010 version relative to these couple of changes here.

You basically said, well, if you're in for a penny, you're in for a pound.

If you want those changes, you've got to be willing to adopt that whole package.

Is that --

MR. SHERON: No.

COMMISSIONER MERRIFIELD: No. Okay.

MR. SHERON: Well, you can do it either that way -- if you adopt the entire package and if that package has been endorsed by the staff, then --

COMMISSIONER MERRIFIELD: I'm saying in the absence of endorsement.

MR. SHERON: Okay.

In the --

COMMISSIONER MERRIFIELD: Let's say we have affixed it.

MR. SHERON: Right.

COMMISSIONER MERRIFIELD: We have not changed our baseline, it remains a '95 baseline, but that an individual utility wants to take the benefit of changes relative to a 2010 version.

MR. SHERON: They can come in and request through the relief process that those two -- and we would evaluate them, and if we believe that --

MR. MIRAGLIA: I think there's two issues here.

In terms of -- we will look at new codes and endorse codes but not say that they're mandatory.

If they want to implement that endorsed code, they have to take the whole thing, and we're going to endorse

those code changes on a more expedited basis.

COMMISSIONER MERRIFIELD: So, if I'm a utility and we're all subject to the '95 code and the Commission has not adopted an update to that, I mean in terms of requiring an update, and utility X says, gee, there's this one change in the 2010 code that I like, you're saying they have to come in and they have to adopt the entirety of that.

MR. MIRAGLIA: No. They could adopt the whole code without coming to us.

COMMISSIONER MERRIFIELD: What do they have to do to get that change?

MR. STROSNIDER: The proposal is, if we, 20 years down the road, have endorsed the 2010 code and a licensee wants to accept it in its entirety, they could do that without coming to us.

We'd want them to tell us, but they don't need our approval.

They could do it, we've already endorsed it, go take the whole thing.

If they see one piece of it that they like and they don't want to take the whole thing, then they would come under -- they would come into the NRC under the existing provisions and request an alternative to whatever code they were baselined at, and we would review that and determine whether it was an acceptable alternative.

COMMISSIONER MERRIFIELD: Okay.

Just so this is clear, they could say we only want that one change from 2010 and submit that to the agency. They wouldn't be required to take the whole thing.

MR. STROSNIDER: The difference is we would review it.

What we're saying they can't do is go cherry-pick from the 2010 code without NRC reviewing what they're picking, and Mr. Perry pointed out that there has to be -- you know, when you look at the code, you've got to make sure you're picking up all the relevant portions, and that's the sort of thing we would be looking at.

COMMISSIONER MERRIFIELD: That's my only question, Mr. Chairman.

The only thing I would say is you had a line of questioning on this panel in which you stated that what we are perhaps faced with -- you know, we're affixing to '95 -- is we may have the potential, at least, for having more changes out there and a lot more variation down the line if we maintain this '95 standard, and I have to say I share your concern about that.

We are at a point in this agency where we are asked to be more user-friendly.

We're also asked to reduce our costs, and I think, you know, this may be one of those cases where trying to

meet both of those and have regulatory predictability and have confidence of our stakeholders may be coming into conflict. I think we need to think hard about this one.

Thank you, Mr. Chairman.

CHAIRMAN MESERVE: I'd like to thank the staff and our earlier panel, as well, for a very helpful presentation this morning, and with that, we're adjourned.

[Whereupon, at 11:33 a.m., the meeting was concluded.]

CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON EVALUATION OF THE REQUIREMENT FOR LICENSEE TO UPDATE THEIR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAM EVERY 120 MONTHS -- PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Friday, March 24, 2000

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company.

Transcriber: Tamara Shipp

Reporter: Mike Paulus

# Proposed Rulemaking on the Elimination of the 120-Month Update Requirement

March 24, 2000

Ralph Beedle, NEI



## Proposed Rulemaking

- Codes and Standards
- Elimination of the 120-Month Update Requirement

## Codes & Standards

- Standards Development
  - Positive contribution
  - Consensus process
  - Maintain balance of interest
  - Value to end users
  - Continued industry participation



## Codes & Standards

- Public Law 104-113
  - Encourage federal agencies to benefit from private sector initiatives
  - Reduce reliance on government-unique standards

## Codes & Standards

- NRC endorses approx. 4000 codes and standards
- 20 standards are mandated by regulation
- NRC rulemaking not timely or flexible
- NRC imposes limitations and modifications



## Proposed Rulemaking

- Voluntary updates of entire editions and addenda
- Any of the options will maintain an "acceptable level of safety"
- Code changes "not necessarily justified compared with costs imposed on licensees"

## Proposed Rulemaking

- Backfitting Rule Implications
  - Safety significance
  - Cost of implementation
- Eliminate the 120-month requirement
- Baseline the 1989 Edition of the ASME Code
- Sound regulatory policy



NEI

## Proposed Rulemaking

- Option 1B
  - Unnecessary regulatory requirement
  - No demonstrated safety benefit
  - Unnecessary expenditure of resources - additional 10 year cycle
- Recommend Commission adopt Option 1A



NEI

# EVALUATION OF REQUIREMENT FOR LICENSEES TO UPDATE INSERVICE INSPECTION & INSERVICE TESTING PROGRAMS EVERY 120 MONTHS

March 24, 2000

Brian W. Sheron
Jack R. Strosnider
Thomas G. Scarbrough

NRC Office of Nuclear Reactor Regulation

# OVERVIEW

- Licensees required to update ISI/IST programs every 120 months to ASME Code incorporated in 10 CFR 50.55a.
- Licensees suggested automatic updating of ISI/IST programs not needed to maintain safety and causes unnecessary burden.
- NRC staff obtained stakeholder comments.
- NRC staff recommends periodic ISI/IST updating using 10 CFR 50.109.

# CURRENT ISI/IST UPDATING APPROACH

- NRC regulations require licensees to update ISI/IST programs to 1995/1996 Code at next 120-month interval.
- Current approach may result in use of outdated Codes unless accelerated implementation mandated.
- IST programs applying 1983 edition at 5 reactor units, 1986 edition at 18 units, and 1989 edition at 81 units.
- Some plants applying Code provisions 17 years old without adverse safety impact.

# MILESTONES

- April 27, 1999: Proposed rule.
- May 27, 1999: Public workshop.
- June 24, 1999: Staff directed to complete endorsement of 1995/1996 ASME Code.
- September 22, 1999: Final rule published incorporating 1995/1996 ASME Code.
- January 14, 2000: SECY-00-0011.
- February 8, 2000: ACRS recommendation to retain ISI/IST update requirement.

# OPTIONS

1. Replace ISI/IST update requirement with baseline Code and allow voluntary updating unless more recent baseline Code mandated per 10 CFR 50.109.

   A. 1989 Edition; 1992/1992 Class MC and CC; 1995/1996 Appendix VIII for ultrasonic qualification,

   B. 1995/1996 ASME Code, or

   C. 1998 Edition of ASME Code.

2. Retain ISI/IST update requirement.

3. Retain ISI/IST update requirement and develop guidance for plant-specific alternatives.

# MAINTAINING SAFETY

- Each option maintains safety by updating ISI/IST programs based on specific criteria.
- Endorsement of 1995/1996 Code recognizes improvements since 1989.
- Option 1 will endorse future Code editions for voluntary use and require updating based on 50.109.
- Importance of Code maintained by timely endorsement of new baseline Code editions.
- Updating process will assess program adequacy.

# INCREASING PUBLIC CONFIDENCE

- Option 1 will increase public confidence by applying 50.109 to ISI/IST updating consistent with other new requirements for operating reactors.
- Option 2 may increase public confidence by requiring updating to latest Code regardless of safety significance.
- Option 3 might decrease public confidence by limited public participation in approval of alternatives.

# REDUCING UNNECESSARY BURDEN

- Updating an ISI/IST program can cost over $1 million per plant.
- Under Option 1, licensees required to update ISI/IST programs only when Code improvements satisfy 50.109.
- Costs of submitting relief requests will continue.
- Option 1 provides greatest flexibility for licensees to minimize burden.

# MAKING NRC ACTIVITIES MORE EFFECTIVE, EFFICIENT, AND REALISTIC

- Staff will improve ISI/IST updating process under Option 1 by more frequent Code endorsement.
- Option 1 will provide consistent application of 50.109 to ISI/IST updating similar to other new requirements for operating reactors.
- No option would result in significant NRC resource savings.

# MAKING NRC ACTIVITIES MORE EFFECTIVE

## (CONTINUED)

- Staff encouraging risk-informed programs and Code initiatives to improve long-term ISI/IST approach.
- Staff participates in Code process.
- Modification of updating process will not significantly affect range of applied Code editions.
- Any inconsistency in NRC and State positions resolved by federal preemption.

# RECOMMENDATION

- **Option 1.B best addresses strategic outcome goals.**
- **1995/1996 Code baseline selected because most recent version in regulations and improvements since 1989.**

# Commission Briefing By ASME
# On
# Evaluation of Requirements for Licensees to Update Their ISI/IST Programs

## March 24, 2000
## Rockville, Maryland

## By


## James A. Perry, PE
## Past VP Nuclear Codes & Standards

# Benefits Outweigh Costs

- Updating focuses on evaluation of entire program, identifies deficiencies & forms the basis for making corrections & enhancements to ISI/IST Programs
- Average costs of ISI update $200,000
- NRC mandated one-time costs add significantly to total, for example containment inspection (IWE/IWL) & Appendix VIII
- Review fees add to costs incurred for exceptions & relief requests required to use Code Cases or rules from later editions of the code

# ASME Codes Are Living Documents

- Changes result from new or improved inspection/test/materials/design methodologies
- Changes reflect lessons learned from over 30 years of nuclear operational experience
- Codes moving from prescribed repetitive inspections & tests to more risk-informed and performance-based approaches
- Numerous changes have occurred since the 1989 edition that improve safety including reducing radiation exposure, improve industry standards, reduce burden, and respond to inquiries and user feedback

# ASME Code Changes 1989 to 1999

| Change Categories | BPV Section XI | | OM Code | Total |
|---|---|---|---|---|
| | Primary Basis | Secondary Basis | | |
| IS | 10 | 2 | 3 | 15 |
| IIS | 124 | 8 | 18 | 150 |
| RRE | 1 | 24 | 4 | 29 |
| RR | 29 | 6 | 8 | 43 |
| M | 91 | 1 | 18 | 110 |
| Total | 255 | 41 | 51 | 347 |

IS-improved safety; IIS-improved industry standard; RRE-reduced radiation exposure; RR-reduced requirements; M-maintenance

# ASME Consensus Process and Use of Volunteers

- Broad-based balanced group of experts produce Code changes (30% utilities, 30% consultants, 40% include enforcement/regulatory, manufacturers, & inspection from insurance companies)
- Multiplier Effect
- Consensus Process Used in All ASME Codes and Standards

# Negative Impact of Deleting Update Requirement

- The current proven process would be replaced by one that introduces many unknowns and uncertainties
- Evaluation & reports to OMB would cause increased burden on NRC staff
- By NRC applying only selected parts of different code Editions on licensees, confusion is created regarding proper overall implementation and maintenance of ISI/IST Programs
- Proposed rulemaking creates greater inconsistencies between federal and state requirements that would have a negative impact on Code users

# Conclusion

**Keeping the 120 month update maintains the stable system which works to provide an integrated approach to safety improvement and burden reduction**

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001

March 17, 2000

MEMORANDUM TO: Annette L. Vietti-Cook
Secretary

FROM: John T. Larkins, Executive Director
Advisory Committee on Reactor Safeguards

SUBJECT: BRIEFING ON EVALUATION OF THE REQUIREMENT FOR LICENSEES TO UPDATE THEIR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAMS EVERY 120 MONTHS - MARCH 24, 2000

Dr. William Shack, ACRS Member, is scheduled to brief the NRC Commissioners on March 24, 2000, between 9:30 and 11:30 a.m. concerning the proposed amendment to 10 CFR 50.55a to eliminate the requirement for licensees to update their inservice inspection and inservice testing programs every 120 months. Presentation materials related to this briefing are attached.

Attachment: As stated

cc: ACRS members
ACRS staff

# PROPOSED AMENDMENT TO ELIMINATE REQUIREMENT TO UPDATE ISI AND IST PROGRAMS EVERY 120 MONTHS

Dr. William J. Shack
Advisory Committee on Reactor Safeguards

March 24, 2000

# ACRS RECOMMENDATIONS AND OBSERVATIONS

- Retain the 120 month update requirement in 10 CFR 50.55a

- Arguments are made as to the maturity of the process, but significant changes have been made to the ASME Code over the past 120 months that the staff has recognized need to be included in their proposed baseline for Option 1.

- Inspections are crucial part of aging management programs for license renewal.

- ASME provides a peer review of inspection requirements and as such increases confidence of stakeholders in effectiveness of inspections.

# ACRS RECOMMENDATIONS AND OBSERVATIONS

- In License Renewal applications applicants are evaluating effects that are not presently addressed by the ASME code and developing site-specific aging management programs. Efficiencies may be added to the staff review process if ASME codifies acceptable methods for developing aging management programs.

- 10 CFR 50.109 is not well suited to assess the appropriateness of "structuralist" defense-in-depth requirements

- Industry requests more timely NRC endorsement of ASME Code revisions and Code Cases

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001

February 8, 2000

The Honorable Richard A. Meserve
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Meserve:

SUBJECT: SECY-00-0011, "EVALUATION OF THE REQUIREMENT FOR LICENSEES TO UPDATE THEIR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAMS EVERY 120 MONTHS"

During the 469th meeting of the Advisory Committee on Reactor Safeguards, February 3-5, 2000, we discussed the NRC staff's analysis of ACRS comments and recommendations regarding the 120-month update requirement for inservice inspection (ISI) and inservice testing (IST) programs, which is included in SECY-00-0011 and also in a January 13, 2000, memorandum from the NRC Executive Director for Operations. The staff continues to recommend that the update requirement be eliminated from 10 CFR 50.55a, "Codes and standards." If the update requirement is eliminated, any subsequent NRC-imposed update of Section XI of the American Society of Mechanical Engineers (ASME) Code would be subject to a backfit analysis in accordance with 10 CFR 50.109, "Backfitting."

We continue to recommend that the Commission adopt Option 2 proposed by the staff in SECY-00-0011 and retain the 120-month update requirement for ISI and IST programs in 10 CFR 50.55a.

The assurance of the integrity of the reactor coolant pressure boundary and the containment is one of the cornerstones of the NRC regulatory system. The license renewal process is predicated on the demonstration that any effects of aging on critical plant systems will be adequately managed. Effective ISI and IST programs are crucial to this demonstration and to public confidence in the license renewal process. Because of this, we believe that the ISI and IST standards are different from other industry standards for which there is no mandatory update requirement.

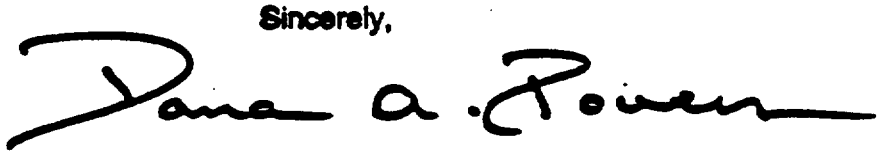
In support of Option 1 in SECY-00-0011, the Nuclear Energy Institute (NEI) and the staff argue that the current ASME Code requirements have reached such a level of maturity that further updating will provide little benefit. We believe that the review of the past decade of experience presented to us by the ASME demonstrated that there were significant changes to the ISI, IST, and operations and maintenance requirements that improved the effectiveness and efficiency of these programs. Indeed, both the staff and NEI recognized that the 1989 version of the Code would have to be updated to include requirements from the 1992, 1995, and 1996 versions of the Code to be considered as an acceptable baseline. The staff and NEI arguments would be

more convincing if they could identify a decade in which significant changes had not been made in the Code. Changes in the Code reflect the latest knowledge and experience in inspections and testing and sometimes provide relief from existing requirements.

Changes are not introduced into the ASME Code requirements frivolously. Approximately 30% of the Section XI membership are representatives of licensees. They have a very good understanding of the impact of any proposed changes on their operations. Any proposed changes are subject to peer review by a broad-based group of experts from the licensees, manufacturers, vendors, the NRC, and other engineering and consulting organizations. If the update requirement is eliminated, the staff may be required to demonstrate to the public, including State officials, why requirements in consensus standards should not be adopted.

Under Option 1, any mandated updates to the ISI and IST programs would have to pass the 10 CFR 50.109 backfit criteria. In SECY-00-0011, the staff argues that it can make qualitative assessments to demonstrate a substantial increase in the overall protection of the public health and safety. We continue to believe that 10 CFR 50.109 evaluations are not well suited to assess the appropriateness of defense-in-depth measures, such as the ASME Code updates. Effective ISI and IST programs based on a broad technical consensus standard are prudent to provide confidence that the effects of aging are adequately managed.

Sincerely,



Dana A. Powers
Chairman

References:


1. SECY-00-0011, memorandum dated January 14, 2000, from William D. Travers, Executive Director for Operations, NRC, for the Commissioners, Subject: Evaluation of the Requirement for Licensees to Update Their Inservice Inspection and Inservice Testing Programs Every 120 Months.
2. Letter dated January 13, 2000, from William D. Travers, Executive Director for Operations, NRC, to Dana A. Powers, Chairman, ACRS, Subject: Draft Commission Paper Regarding 120-Month Update Requirement for Inservice Inspection and Inservice Testing Programs.
3. ACRS letter dated December 8, 1999, from Dana A. Powers, Chairman, ACRS, to the Honorable Richard A. Meserve, Chairman, NRC, Subject: Draft Commission Paper Regarding the 120-Month Update Requirement for Inservice Inspection and Inservice Testing Programs.
4. ACRS letter dated May 19, 1999, from Dana A. Powers, Chairman, ACRS, to the Honorable Shirley A. Jackson, Chairman, NRC, Subject: The Role of Defense in Depth in a Risk-Informed Regulatory System.
5. Memorandum dated June 24, 1999, from Annette L. Vietti-Cook, Secretary of the Commission, to William D. Travers, Executive Director for Operations, NRC, Subject: Staff Requirements - Reconsideration of SECY-99-017 (Proposed Amendment to 10 CFR 50.55a).

6. Letter dated April 19, 1999, from Dana A. Powers, Chairman, ACRS, to William D. Travers, Executive Director for Operations, NRC, Subject: SECY-99-017, "Proposed Amendment to 10 CFR 50.55a."
7. Table provided by ASME during ACRS meeting, December 2-4, 1999, "Important Section XI SG NDE Code Changes and Code Cases, 1989 Addenda through 1999 Addenda," Revision 2, November 1, 1999.
8. Memorandum dated November 12, 1999, from Ashok C. Thadani, Office of Nuclear Regulatory Research, NRC, to John T. Larkins, ACRS, Subject: Generic Safety Issue 190, "Fatigue Evaluation of Metal Components for 60-Year Plant Life."

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D.C. 20555-0001

December 8, 1999

The Honorable Richard A. Meserve
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Meserve:

SUBJECT: DRAFT COMMISSION PAPER REGARDING THE 120-MONTH UPDATE REQUIREMENT FOR INSERVICE INSPECTION AND INSERVICE TESTING PROGRAMS

During the 468th meeting of the Advisory Committee on Reactor Safeguards, December 2-4, 1999, we reviewed the options proposed by the staff regarding the current requirement for licensees to update inservice inspection (ISI) and inservice testing (IST) programs every 120 months to the most recent Edition of the American Society of Mechanical Engineers (ASME) Code incorporated by reference in 10 CFR 50.55a, "Codes and Standards." Our Subcommittee on Materials and Metallurgy also reviewed this matter during its meeting on December 1, 1999. During this review, we had the benefit of discussions with representatives of the NRC staff, ASME, and the Nuclear Energy Institute (NEI). We also had the benefit of the documents referenced.

**Recommendation**

We recommend that the Commission adopt Option 2 proposed by the staff and retain the 120-month update requirement for ISI and IST programs in 10 CFR 50.55a.

**Background**

The staff issued a proposed amendment to 10 CFR 50.55a on April 27, 1999, to solicit public comment on a proposal to eliminate the current requirement that licensees update their ISI and IST programs every 120 months to the most recent edition of the ASME Code incorporated by reference in 10 CFR 50.55a. In a letter dated April 19, 1999, we recommended against eliminating this requirement. The NRC staff held a public workshop on May 27, 1999, to discuss the update requirement. In a Staff Requirements Memorandum dated June 24, 1999, the Commission directed the staff to evaluate public comments on the update requirement and develop options and recommendations on the retention or elimination of this requirement. The Commission also directed the staff to discuss this issue further with the ACRS.

The staff has identified three options:

OPTION 1: Replace the 120-month ISI/IST update requirement with a baseline of ISI and IST requirements, and allow voluntary updating to subsequent NRC-approved Code editions and addenda unless the baseline is revised based on 10 CFR 50.109, where the initial baseline will consist of:

Option 1.A. the 1989 Edition of the ASME Code for ISI of Code Class 1, 2, and 3 components (including supports) and for IST of Code Class 1, 2, and 3 pumps and valves; the 1992 Edition with the 1992 Addenda of Subsections IWE and IWL of the ASME Code for ISI of Class MC and Class CC components and their integral attachments; the 1995 Edition with the 1996 Addenda of Appendix VIII of the ASME Code, Section XI, with limitations and modifications specified in 10 CFR 50.55a,

Option 1.B. the 1995 Edition with the 1996 Addenda of the ASME Code with the limitations and modifications specified in the NRC regulations, or

Option 1.C. a later version (e.g., the 1998 Edition) of the ASME Code with appropriate limitations and modifications.

OPTION 2: Retain the current 120-month ISI/IST update requirement.

OPTION 3: Authorize plant-specific alternatives to the 120-month ISI/IST update requirement.

**Discussion**

The staff evaluated the update options in terms of the strategic goals of the Commission: (1) maintaining safety, (2) increasing public confidence, (3) reducing unnecessary regulatory burden, and (4) making NRC activities and decisions more effective, efficient, and realistic. Although the staff concludes that no particular option has an overwhelming advantage over the other options, it recommends the adoption of Option 1B, which eliminates the mandatory 120-month update. We believe that the later version of the ASME Code would provide technically superior baselines for the ISI and IST programs than the 1989 Edition, which is now over ten years old.

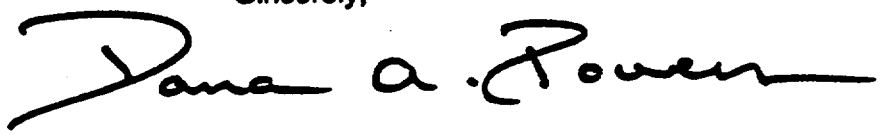
We agree with the conclusion of the staff that any of the options will maintain an acceptable level of safety. Each option purports to include provisions to update ISI and IST programs, although the criteria to require updating differ among the options. Furthermore, the analyses performed in support of the development of risk-informed inspections for Class 1, 2, and 3 piping and those done to support resolution of Generic Safety Issue (GSI)-190 show that ISI has a relatively modest impact on core damage frequency (CDF). We have not reviewed the analyses done to support risk-informed IST programs, but we believe that they would probably also show relatively modest impacts on CDF. This is not surprising. Because failures of these components were anticipated in the design of nuclear power plants, effective mitigation systems and procedures have been developed. However, because assurance of the integrity the reactor coolant pressure boundary and the containment is one of the cornerstones of the NRC regulatory system, ISI and IST programs have been required to provide additional assurance, through application of the defense-in-depth philosophy, of the integrity of these barriers and to compensate for uncertainties.

NEI and the staff argue in support of Option 1 that the current ASME Code requirements have reached such a level of maturity that further updating will provide little benefit. We believe that the review of the past decade of experience presented to us by the ASME demonstrated that there were significant changes to the ISI, IST, and operations and maintenance requirements that improved the effectiveness and efficiency of these programs and that developments in technology and operating experience could lead to additional changes in the inspection programs. Changes are not introduced in the ASME Code requirements frivolously. The ASME Code represents the consensus of a broad-based group of experts that includes strong utility representation (approximately 30% of the Section XI membership) as well as

representation from manufacturers, vendors, the NRC, and other engineering and consulting organizations.

Under Option 1, any mandated updates to the ISI and IST programs would have to pass the 10 CFR 50.109 backfit criteria. The 50.109 evaluation is not well suited to assess the appropriateness of defense-in-depth requirements, which are intended to address uncertainties that are difficult to quantify. In our May 19, 1999 report, we outlined an approach for developing a systematic methodology for the evaluation of defense in depth; however, lacking such a methodology at the present time, decisions on defense in depth will have to be based on judgment. The collective judgment of the broad-based group of experts represented by the ASME Code should be reflected in the inspection requirements.

Sincerely,



Dana A. Powers
Chairman

**References:**


1. Memorandum dated November 18, 1999, from William D. Travers, Executive Director for Operations, NRC, for the Commissioners, SECY-99-XXX, Subject: 120-Month Update Requirement for Inservice Inspection and Inservice Testing Programs (Predecisional Draft).
2. ACRS letter dated May 19, 1999, from Dana A. Powers, Chairman, ACRS, to Honorable Shirley A. Jackson, Chairman, NRC, Subject: The Role of Defense In Depth in a Risk-Informed Regulatory System.
3. Memorandum dated June 24, 1999, from Annette L. Vietti-Cook, Secretary, NRC, to William D. Travers, Executive Director for Operations, NRC, Subject: Staff Requirements - Reconsideration of SECY-99-017 (Proposed Amendment to 10 CFR 50.55a).
4. Letter dated April 19, 1999, from Dana A. Powers, Chairman, ACRS, to William D. Travers, Executive Director for Operations, NRC, Subject: SECY-99-017, "Proposed Amendment to 10 CFR 50.55a."
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6. Memorandum dated November 12, 1999, from Ashok C. Thadani, Director, Office of Nuclear Regulatory Research, NRC, to John T. Larkins, Executive Director, Advisory Committee on Reactor Safeguards, Subject: Generic Safety Issue-190, "Fatigue Evaluation of Metal Components for 60-Year Plant Life."

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

July 23, 1999

The Honorable Greta Joy Dicus
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Chairman Dicus:

SUBJECT: PROPOSED FINAL AMENDMENT TO 10 CFR 50.55a, "CODES AND STANDARDS"

During the 464th meeting of the Advisory Committee on Reactor Safeguards, July 14-16, 1999, we reviewed the proposed final amendment to 10 CFR 50.55a. Our Subcommittee on Materials and Metallurgy also reviewed this matter on March 25, 1999. During these reviews, we had the benefit of discussions with representatives of the NRC staff and of the documents referenced.

## Conclusions and Recommendations

We recommend approval of the proposed final amendment to 10 CFR 50.55a. This amendment will: provide significant improvements in the effectiveness of inservice inspections through the expedited implementation of performance demonstration requirements for inspectors; update other requirements for inservice testing; and incorporate American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Cases for assessment and temporary repair of Class 3 piping.

## Discussion

The staff issued the proposed amendment to 10 CFR 50.55a for public comment in December 1997 and has reconciled the comments it received from 65 separate sources. The proposed final amendment to 10 CFR 50.55a will:

- revise the requirements for the construction, inservice inspections, and inservice testing of nuclear power plant components;
- update 10 CFR 50.55a to endorse the 1995 Edition of the ASME Boiler and Pressure Vessel Code and the 1996 Addenda thereto, with modifications and limitations;
- incorporate by reference for the first time the ASME Code for Operation and Maintenance;

- implement performance demonstrations for ultrasonic examination systems;
- supplement motor-operated valve stroke time testing with programs for demonstrating design-basis capabilities; and
- implement check valve condition monitoring on a voluntary basis.

The proposed final amendment to 10CFR 50.55a includes a number of changes in response to public comments. We believe that the staff has adequately addressed these comments. The proposed rule also contains a number of modifications and limitations on the use of the ASME Code by licensees. We believe that the staff has provided sound arguments for the imposition of these restrictions. The number of restrictions is not excessive. These restrictions do not undermine the intent of the requirement to utilize consensus industry standards.

On April 27, 1999, the staff published a supplement to the proposed amendment to 10 CFR 50.55a requesting public comment on a proposal by the staff to eliminate the current requirement for licensees to update their inservice inspection and inservice testing programs to the latest approved edition of the ASME Code every 120 months. Subsequently, as directed by the Commission, the staff is addressing this proposal in a separate rulemaking. The staff is in the process of resolving public comments on this proposal and we expect to have further discussions on this matter after the staff has reconciled public comments.

Sincerely,

Dana A. Powers

Dana A. Powers
Chairman

References

1. U. S. Nuclear Regulatory Commission, Draft Final Rule, 10 CFR Part 50, RIN 3150-AE26, "Industry Codes and Standards; Amended Requirements," received July 1, 1999.
2. Memorandum dated June 24, 1999, from Annette L. Vietti-Cook, Secretary of the Commission, to NRC Commissioner McGaffigan, Subject: COMEXM-99-001 - Reconsideration of SECY-99-017 (Proposed Amendment to 10 CFR 50.55a).
3. Memorandum dated June 24, 1999, from Annette L. Vietti-Cook, Secretary of the Commission, to William D. Travers, Executive Director for Operations, NRC, Subject: Staff Requirements - COMEXM-99-001 - Reconsideration of SECY-99-017 (Proposed Amendment to 10 CFR 50.55a).
4. Letter dated October 30, 1998, from Gus C. Lainas, Office of Nuclear Reactor Regulation, to Robert L. Seale, Chairman, ACRS, Subject: Final Amendment to 10 CFR 50.55a, "Codes and standards."

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

April 19, 1999

Dr. William D. Travers
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Dr. Travers:

SUBJECT: SECY-99-017, "PROPOSED AMENDMENT TO 10 CFR 50.55a"

During the 461ST meeting of the Advisory Committee on Reactor Safeguards, April 7-10, 1999, we reviewed SECY-99-017. Also, our Materials and Metallurgy Subcommittee met on March 24-25, 1999, to review this matter. During these reviews, we had the benefit of discussions with representatives of the NRC staff and the Nuclear Energy Institute (NEI), and of the documents referenced.

## Recommendation

We recommend against eliminating the 120-month update requirement for inservice inspection (ISI) and inservice testing (IST) programs from the proposed amendment to 10 CFR 50.55a.

## Discussion

In May 1995, we decided not to review the proposed amendment to 10 CFR 50.55a until after the staff reconciled public comments. Since then, the proposed amendment has undergone numerous changes. The staff has reviewed the public comments and is preparing the proposed final amendment to 10 CFR 50.55a. Based on internal staff discussions and the public comments, the staff is considering eliminating the regulatory requirement that licensees update their ISI and IST programs to the latest American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code every 120 months. Before proceeding with the final amendment to 10 CFR 50.55a, the staff plans to request public comments specifically on the proposed elimination of the 120-month update requirement.

The staff originally endorsed the ASME Code in 1971. Recognizing that the ASME Code would be updated as experience was gained with its application, the staff also required licensees to update their ISI and IST programs every 120 months.

The primary justifications for the proposed elimination of the update requirement are the maturation of the currently applicable ASME Code and the reduction of the burden on licensees caused by the updating of ISI and IST programs.

We are perplexed by the argument that experience suggests that the current ASME Code requirements have reached such a level of maturity that further updating will provide little benefit. We have recently reviewed a staff safety evaluation report (SER) on a Westinghouse topical report concerning risk-informed inspections. The topical report demonstrated that current ASME Code inspections were not an effective use of resources, and that significant improvements in inspection efficiency could be achieved through the use of risk insights and operational experience. In addition, pilot efforts on risk-informed IST seem to promise similar benefits.

During the past decade, experience has shown that performance demonstrations are superior to prescriptive requirements for qualifying inspectors and inspection techniques. The experience of the past decade has also demonstrated that new modes of degradation can occur and may require changes in inspection procedures. Erosion/corrosion, boiling water reactor (BWR) vessel internals cracking, and circumferential stress corrosion cracking of steam generator tubes were not recognized as important degradation modes a decade ago and inspection procedures had to be updated to deal with such degradation modes. Inspection technologies have also matured. Indeed, in technologies that are heavily dependent on electronics and computer analysis of signals, a decade may represent four or five generations of technology.

This experience suggests that inspection technology is not so static and mature that 120-month updates are unnecessary. Rather, changes in technology and inspection requirements frequently require prompter action than can easily be accommodated by modifications of the ASME Code. The review of operational experience and technology changes through the ASME Code consensus process is important and worthwhile. The 120-month update provides a good baseline for inspection requirements.

In SECY-99-017, the staff recommends the elimination of the 120-month update requirement. Anecdotal information in SECY-99-017 suggests that a typical update may cost a licensee $200,000 to $300,000 every 10 years. An NEI representative cited an anecdotal number of $1 million. Even if this higher estimate is more realistic, the resultant burden does not seem excessive since the actual costs of inspections are far higher than the update costs. Updating would be expected to provide more cost-effective inspections and lower exposures.

In SECY-99-017 the staff states that if the 120-month update requirement is eliminated, licensees who voluntarily choose to update to a later ASME Code edition or addenda

will be required to implement all provisions of that edition or addenda. We concur with this staff position on implementing all the provisions of an edition or addenda.

Sincerely,

Dana A. Powers

Dana A. Powers
Chairman

References:


1. SECY-99-017, memorandum dated January 13, 1999, from William D. Travers, Executive Director for Operations, NRC, for the Commissioners, Subject: Proposed Amendment to 10 CFR 50.55a.
2. U. S. Nuclear Regulatory Commission, Safety Evaluation Report Related to "Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection" (Topical Report WCAP-14572, Revision 1), October 1998 (Predecisional).
3. Westinghouse Energy Systems, WCAP-14572, Revision 1, "Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report," October 1997.
4. Westinghouse Energy Systems, WCAP-14572, Revision 1, Supplement 1, "Westinghouse Structural Reliability and Risk Assessment (SRRA) Model for Piping Risk-Informed Inservice Inspections," October 1997.
5. Letter dated August 14, 1998, from John N. Hannon, Office of Nuclear Reactor Regulation, NRC, to C. Lance Terry, TU Electric, Subject: Approval of Risk-Informed Inservice Testing (RI-IST) Program for Comanche Peak Steam Electric Station, Units 1 and 2.

# Background Material For March 24, 2000 ASME Presentation to USNRC Commissioners

**Enclosed are the following:**

- **Summary of Important BPVC Section XI Code Changes and Code Cases: 1989 Addenda through 1999 Addenda**
  - **Nondestructive Examination-pgs. 1-6**
  - **Water Cooled Systems-pgs. 7-9**
  - **Repair/Replacement-pgs. 10-14**
  - **Liquid Metal Cooled Systems-pgs. 15-16**

- **OM Code Revisions- 1990 to Present pg. 17**

- **ASME President Nickell Letter 6/16/99 to USNRC Commissioners-pg.18**

- **ASME Response to Federal Register Notice Vol. 64 No. 80 April 27, 1999-pgs. 19-25**

# Important Section XI SG NDE Code Changes and Code Cases
# 1989 Addenda through 1999 Addenda

(Note 1) Revision 2, 11/1/99

| Description of Code Change or Code Case: | Purpose/Benefit: | Classification: (See Note 2) |
|---|---|---|
| 1. Requirements for demonstrating ultrasonic(UT) examination performance were added to the Code in the 1989 Addenda as Appendix VIII, "Performance Demonstration for ultrasonic Examination Systems". Incorporated Code Case N-409-2. | Section XI determined that Code prescribed UT methodology may not perform predictably in the presence of some service induced damage mechanisms. Appendix VIII established a "show me" approach to applied UT by providing criteria for qualifying the procedure, equipment, and personnel called collectively the "UT System". The benefits realized with Appendix VIII include safety improvements with improved flaw detection and sizing for reactor pressure vessel under clad regions, for piping systems and it provided improved confidence in NDE contributions to failure probability calculations. Minimizes personnel exposure by using appropriate detection and flaw sizing approaches the first time. Saves costs by better utilizing NDE resources. | IS, IIS, and RRE |
| 2. Provided a consensus approach for surface preparation of new pipe welds to make them more accessible for NDE. | These requirements provide direction for weld reinforcement surface contours for new welds to optimize UT search unit contact. Change recognizes that all welds are surface prepared and if performed properly can significantly improve access for UT examination. The requirements were later adopted in Section III for pre-service inspection. | IIS and RRE |
| 3. Replaces the surface examination requirement for reactor closure head nuts (Item B6.10) with a VT-1 visual examination. | Alternative requirements to eliminate a costly examination that had absolutely no value added benefit. Approximately 18 years of surface inspection did not report any relevant findings. A 90% cost reduction. | IIS |
| 4. Limited UT scan for flaws oriented transverse to welds in carbon and low alloy steel piping, excluded were welds with transverse flaws reported during the pre-service examination. | Change accepts UT of long. seam at intersection of circ. seam as only need & that transverse flaw initiation was not plausible during service in carbon and low alloy steel piping. Experience justified the change. Cost savings. | IIS and RRE |
| 5. Made mandatory, practical examinations for qualification and certification of Level III NDE Personnel. Incorporated Code Case N-489. | The change ensures that Level III individuals have and maintain appropriate skills to practice NDE examinations. | IIS |
| 6. Provided more specific requirements regarding which bolts should be examined when evidence of leakage is identified. | Optimized corrective action when leakage at bolted connections is identified, minimized aging affects from handling, removal and reinstallation of bolting. | IIS |
| 7. Revision replaced system functional test and system in-service test with the system leakage test for Class 1,2,and 3 systems and components. | Clarifies and simplifies pressure levels at various locations throughout the system during the pressure test. Cost savings. | IIS and RRE |
| 8. Changed NDE Examiner vision acuity/examination test requirements from Jaeger to Snellen and provides near-distance qualification requirements. Incorporated Code Case 490-1. | Established requirements equivalent and common to eye care service providers. | IIS |
| 9. Combined the hydrostatic testing of the Class 2 portion of BWR Main Steam System with the hydro test of the Class 1 portion when it cannot be isolated. Incorporates Code Case N-479. | Resolves a Code implementation problem. Cost savings. | IIS |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| 10. Exempts open ended vent and drain lines and open ended safety and relief valve discharge lines from a flow path test. | Eliminates requirement to perform an impractical flow test that had no value added benefit. Cost savings | IIS |
| 11. Adds requirements for application of Appendix VIII flaw sizing to vessels less than 2 inches thickness and on components other than those identified in Appendix VIII scope. | Recognizes need for use of procedures/techniques specific to sizing of flaws, allows use of procedures already qualified and minimizes need for additional qualifications. | IS, and IIS |
| 12. Clarifies that calibration materials need not be the same grade as the material to be examined with appropriate demonstration(s). | Makes it more practical to obtain material for vintage components. Cost savings. | IIS |
| 13. Clarifies Appendix VIII and permits a 10% tolerance on the thickness of flawed test specimens used during qualifications. | Reduces numbers of specimens required in the test sets. Cost savings. | IIS |
| 14. Adopts increased provisions for qualification of ultrasonic examination personnel, changes include specific requirements for UT training and adds requirements for qualification of the NDE Instructor. (Appendix VII) | The change provides supplemental qualification requirements unique to personnel that perform UT examinations in Nuclear power Plants. The changes respond to an identified need to improve UT examiner skills. | IS and IIS |
| 15. Incorporated the provisions of the new ASTM E 1324-1990 "Guide for Measuring Some Electronic Characteristics of Ultrasonic Instruments" | Adapts a consensus standard for characterizing electronic instruments, modifies tolerances on the basis of recent data, and allows complete system characterization as opposed to individual components. | IIS |
| 16. Clarified definition of limited certification and permits reduction of corresponding training hours, examination content and experience. Incorporates Code Case N-503. | Change recognized and resolved excessive qualification requirements for individuals used to perform limited tasks during the implementation of NDE procedures. Change results in significant improvements in NDE resource utilization during outages. Cost savings. | IIS and RRE |
| 17. Incorporated Intent Inquiry XI-1-89-66 regarding lowest test pressure during a system pressure test. | Change clarifies that the 106 percent over-pressurization limit takes priority over achieving minimum pressure throughout the system. Cost savings. | IS and IIS |
| | | |
| 18. Additional requirements for performing a containment pressure test following repair or replacement. | New requirements address leakage tests, pressure test schedules, test procedures, examinations, and corrective measures. | IIS |
| 19. Provide guidance for performing UT thickness measurements required by Section XI. | Section XI did not provide requirements for measuring thickness using UT equipment. | IIS |
| 20. Provided new requirements for color resolution for remote visual examination. | Accounts for needs for color resolution for detection of certain material damage mechanisms such as corrosion. | IIS |
| 21. Change incorporated Code Case N-498, Alternative Rules for 10-Year Hydrostatic Pressure Testing for Class 1 & 2 Systems. The action provides for system leakage test in lieu of a hydrostatic test. | A significant cost savings and man-rem exposure reduction because it allowed the ten-year pressure tests to be conducted at nominal operating pressure. Change recognized extreme difficulty of hydrostatic testing with no value added benefit over a system leakage test. | RRE and IIS |
| 22. Incorporated Intent Inquiry XI-1-92-04, clarifying that pneumatic test may be performed in lieu of a system leakage test or a system hydrostatic test for Class 2 or 3 steam systems, after a repair, replacement or alteration. | Code improvement resolved an impractical requirement. | IIS |
| 23. Incorporated Intent Inquiry XI-1-92-51, clarification for gaseous systems, requirement to remove a bolt and perform a VT-3 examination does not apply. | Resolved impractical Code requirement. Cost savings. | IIS & M |
| 24. Appendix VIII UT Performance demonstration, scheduled or | New Supplements 10 and 11 were completed after Appendix was initially | IIS |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| planned scope increase to add dissimilar metal welds, weld overlays and Supplement 12 reduced requirements for an individual that qualifies for more than one technique. Flaw depth sizing was changed to use a root mean square basis instead of linear regression, a more fair and meaningful assessment. | published, they were agenda items from the beginning. Supplement 12 and introducing root mean square for sizing qualification criteria optimized and tuned the performance demonstration process to account for implementation issues including cost reduction. | |
| 25. Appendix I, reinstates requirements previously specified in 1986 Edition to enable use of flat calibration blocks. | Significant cost savings for calibration block fabrication, resolves material availability issues. | M |
| 26. Incorporates Code Case N-457 to permit the qualification notch of a stud to be one diameter from the end of the stud. | Resolved an implementation issue and established uniformity regarding qualification of UT techniques for studs. | IIS |
| 27. Adds Supplement 13 to Appendix VIII to provide coordinated implementation of Supplements 4,5,6,& 7. | Optimized Appendix VIII multiple qualifications, further tuned process for cost effectiveness. | IIS |
| 28. Incorporated Code Case N-485-1 which permits use of eddy current methodology for surface examinations. | A significant cost savings alternative to eliminate the need to remove paint or other surface protective coatings for Code required surface examinations. | IIS & RRE |
| 29. Incorporated Code case N-458 to allow use of the yoke method for magnetic particle examination of coated surfaces on ferritic materials, without removing the surface protective coating. | Provided the technical justification and a significant cost savings for implementing surface examination requirements where protective coatings exist. Eliminated need for removing the protective coating. | IIS & RRE |
| 30. Incorporated intent inquiry XI-1-92-70, to clarify that personnel qualified to any edition/addenda are qualified to all earlier editions/addendum. | This an other clarifications reduced administrative burden of the re-certification process and frees up resources. Cost savings. | IIS |
| 31. Eliminates IWA-5213 holding time requirements for system leakage tests. | Optimized leak testing requirements and reduced ISI impact on critical path. Cost savings. | IIS |
| 32. Incorporates interpretation XI-1-92-52 for leak testing of buried components. | Change simplifies and clarifies the requirements for pressure testing buried components with or without isolation valves. | IIS |
| 33. Incorporated Code Case N-461 in Appendix III to set a piping calibration block thickness tolerance of plus or minus 25%. | Significant cost savings that reduced the number of blocks required because several pipe schedule thickness' overlapped or are close so as to not impact the UT examination. | IIS |
| 34. Several changes to Appendix VIII to coordinate qualifications, minimize test specimens, and reduce overall number of qualifications that a UT examiner must perform. | Implementation of Appendix VIII showed a need to determine when 'enough was enough' for the number of qualifications that an individual had to perform. Benefits were cost savings and reduced burdens on the individual. | IIS & RR |
| 35. Appendix VIII, Incorporated Code Case N-542 to eliminate the length sizing demonstration requirements for nozzle corner radius examinations. | Made UT qualification consistent with Article 3000 flaw acceptance standards which are based on flaw depth only, no length criteria is specified. Cost savings. | IIS |
| 36. IWA-2315, and Appendix IV, adds requirements or performance demonstration of eddy current examination systems and personnel. Incorporated code cases N-307-1 & N-553. | Incorporates provisions for cost effective use of eddy current techniques including provision for demonstrating that the techniques are effective. Cost savings. | IIS and RRE |
| 37. Incorporates Code Case N-538 updating Appendix VIII Supplements 2, 10, 11, & 12. | Expands use of RMS flaw sizing acceptance criteria improves description of capabilities and reduces failures due to occasional errors. Cost savings. | IIS |
| 38. IWA-2314, incorporated Code Case N-574 which extended Levels I & II re-certification cycle from 3 to 5 years. | Reduced administrative burden of the re-certification process and frees up resources. Cost savings. | IIS |
| | | |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| 39. Revisions to IWA-2310 & 2314 to incorporate ASNT's ACP Standard CP-189 (central certification). | ACCP Standard is consistent with the central certification requirements of ISO-9712. This change promotes globalization of NDE certifications and central certification would eliminate the need to recertify at individual companies/sites. Cost savings. | IIS |
| 40. IWA 2240, incorporates Case N-587, alternative NDE requirements for repair /replacement activities. | Allows use of 90's vintage NDE methodology vs outdated construction Code requirements provides the advantage of using the NDE method/technique to accept repairs that was used to identify the flaw. | IS & IIS |
| 41. Incorporated Case N-534, to permit leakage testing at normal operating pressure for Class 2 & 3 pneumatic tests, in lieu of hydrostatic pressures of 1.1 or 1.25 times design. | Significant cost savings that simplified leakage testing procedures. | IIS |
| 42. IWA-2300 to incorporate Case N-546 to allow alternate qualification methods for VT-2 examination personnel. | Provides requirements in which credit is taken for plant walkdown experience. The alternative qualification also eliminates the need to re-qualify/re-certify every 5 years. Cost savings. | IIS |
| 43. Revisions to IWA-2300 to allow alternative qualifications for VT-3 examination personnel. | Provides reduced requirements in which credit is taken for installation and maintenance experience. Re-qualification/re-certification was extended to 5 years. Cost savings. | IIS |
| 44. New Appendix VI, Qualification of Personnel for Visual Examination. | Visual qualification requirements are not typically outlined in the Qualification and Certification standards referenced in the Code (i.e. SNT-TC-1A and CP-189). New Appendix VI provides training and examination requirements for employers to include in their written practice. | IIS |
| 45. Appendix-IV, incorporated Cases N-401-1 & N-402-1 to update Code on latest applied eddy current examination technology. | Code update incorporating latest multi-frequency techniques for eddy current examination. | IIS |
| 46. Code Case N-618 permits elimination of nozzle inner radius examinations for pressurizer and steam generator nozzles. | Discontinues examinations after 30 years of operating experience shows no potential for initiation of degradation in those locations. Cost savings. | RR |
| 47. Code case N-613 reduces reactor vessel nozzle-to-vessel weld inservice examination volumes. | Eliminates examination volumes not subject to service induced degradation. Cost savings. | IIS & RRE |
| 48. Code Case N-592 enables use of ASNT Central Certification (ACCP) as alternative to IWA-2300. | Endorses central certification, an option to simplify site to site qualifications. Reduces administrative burden. Cost savings. | IIS |
| 49. Code Case N-587 NDE alternatives for repair/replacement activities. | Allows for use of updated NDE methodology vs antiquated Construction Code NDE. | IS & IIS |
| 50. Code Case N-583 reduces annual training for UT examiners from 10 to 8 hours. | Makes timing more consistent with shift schedules timing. | IIS |
| 51. Code Case N-574, extends re-certification time to from 3 to 5 years. | Reduces administrative burden and frees up resources. Cost savings. | IIS |
| 52. Code Case N-553 permits use of eddy current examination as an alternative to surface examinations required for pipe welds. | Cost savings and reduction in radiation exposure. | IIS & RRE |
| 53. Code Case N-552 allows use of computer modeling to reduce numbers of required mockups and performance demonstrations for nozzle examinations. | Saves millions of dollars in costs of mockups for demonstrating UT techniques on dozens of different nozzle configurations. Provides validation of all applied UT techniques. | IIS |
| 54. Code Case N-546 alternative qualification for VT-2 personnel. | Permits qualification of plant personnel that are well qualified by experience and job function to perform those examinations. Cost savings. | IIS |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| 55. Code Cases N-545, N-542, N-541, N-538, N-537, associated with Appendix VIII implementation. | Changes made Appendix VIII implementation possible. | IIS |
| 56. Code Case N-543 provides alternative intervals for periodic verification of digitally generated time-baselines in mechanized equipment. | Cost effective changes accounting for digital equipment stability. Cost savings. | IIS |
| 57. Code Case N-534 permits use of normal operating pressure for Class 2 & 3 pneumatic tests, in lieu of hydrostatic pressures. | Simplifies leak testing, significant reduction on outage impact. Cost savings. | IIS |
| 58. Code Case N-533 provides alternatives to removal of insulation from Class 1 pressure retaining bolted connections while the system is at operating pressure and temperature. | Permits hot examination to be performed without removal of insulation. Examinations are performed with insulation removed after depressurizing the system. Cost savings. | IIS & RRE |
| 59. Code Case N-524 limits extent of inservice examinations of longitudinal weld seams in piping. | Significant cost savings based on experience and no potential damage mechanisms for the piping addressed. | RRE |
| 60. Code Case N-503 allows reduced qualification requirements for personnel used in limited scope activities related to NDE performance. | Reduces administrative burdens and minimizes costs to use personnel in limited NDE assignments. Reduces radiation exposure to fully certified NDE personnel. | IIS & RRE |
| 61. Code Case N-498 including 4 revisions to update and optimize pressure testing. | Allows system leakage testing in lieu of hydrostatic testing, significant cost savings with reduction of ISI outage impact and simplification of procedures. | IS & IIS |
| 62. Code Case N-495 allows the functional provisions of IWV as an alternative to system hydrostatic testing for relief valves reinstalled in the system. | Significant cost savings with reduction in resources and impact on outage schedule. | IIS |
| 63. Code case N-481 alternative visual examinations in lieu of volumetric examination of cast austenitic pump casings. | Provided alternative to non-meaningful examination based on no credible inspection method and no experience or potential for failure. Cost savings. | IIS & RRE |
| 64. Code case N-479-1 allows for pressure testing main steam valves to Class 1 requirements when it cannot be isolated. | Code optimization. Cost savings. | IIS |
| 65. Code Case N-471 enables use of acoustic emission to monitor flaw growth in lieu of IWB 2420 Successive Examinations. | Significant cost savings that eliminates need for removal of reactor fuel and internals for 3 consecutive periods (3 years) to monitor a flaw evaluated as acceptable for continued service. | IIS & RRE |
| 66. Code Case N-416 allows alternatives to hydrostatic testing including deferrals and NDE in lieu of pressure testing. | Significant cost savings and reduction in operational exercises during outages. | IIS |
| 67. Code Case N-335 updated Appendix III to include UT methodology for austenitic pipe welds. | Codefied requirements for UT of austenitic piping in response to service induced stress corrosion cracking. Improved quality of pipe weld examinations. | IS, IIS & RRE |
| 68. Code Case N-522 allows the use of Appendix J testing of Class 2 penetration piping rather than Section XI System Leakage Tests. | Allows plants to take credit for their Appendix J testing, which is required to be performed on all piping that is Class 2 for the purposes of containment penetration, in lieu of performing Section XI leakage tests. Eliminates a significant number of redundant pressure tests. Significant cost savings. | IIS |
| 71. Code Case 307 alternative examination volume for Class 1 bolting. Also permits the option of a surface or volumetric examination when the studs are removed. | Can reduce time spent on an examination by factor of 10 or more. Significant cost savings. | IIS |
| 72. Code Case N-622 Appendix VIII rewrite. | Updates Appendix VIII to resolve remaining Code implementation issues and resolve issues with a proposed NRC Regulation. | IS & IIS |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| 73. Code Case N-566-1 Provides evaluation process as a corrective measure in lieu of bolting removal. | Improved technique/methodology, reduces radiation exposure, Significant cost savings. | IIS & RRE |

Notes:

1) Items listed in this table are the more important Section XI SG NDE changes and Code Cases approved in the ten years from the 1989 Edition through the 1999 Addenda. Overall, during this time frame, individual actions which resulted in a published Code change, for which the Subgroup on NDE was responsible, numbered 89 (which includes the important actions separately listed in the table). In addition, Code Cases and Case revisions, for which the Subgroup on NDE was responsible, numbered 94 (which includes the important Cases separately listed in the table). These Code changes and Code Cases are broken down by primary classification as follows (using the classification in Note 2 below):

**Code Changes:**
Improved Safety (IS): 5
Improved Industry Standards (IIS): 40
Reduced Radiation Exposure (RRE): 1
Reduced Requirements (RR): 0
Maintenance of the Code (M): 43
Total Code Changes: 89

**Code Cases/Case Revisions:**
Improved Safety (IS): 3
Improved Industry Standards (IIS): 59
Reduced Radiation Exposure (RRE): 1
Reduced Requirements (RR): 1
Maintenance of the Code (M): 30
Total Code Cases and Case revisions: 94

In addition, due to the importance of reducing radiation exposure to personnel, 8 out of the 89 total Code changes and 8 out of the 94 Code Cases/Case Revisions resulted in a reduction of radiation exposure, even though the primary classification was not noted as Reduced Radiation Exposure in the overall totals noted above.

2) Code changes and Code Cases are classified using the following classification system and abbreviations:

- IS - Improved Safety. Those action items that have an obvious affect on plant safety, such as improving the assurance of pressure boundary integrity or reducing core damage frequency as determined from a risk approach.
- IIS - Improved Industry Standard. Improvements including, for example, new or better methods and processes, clarified or improved understanding of requirements due to Code changes, and changes to address industry experience. "Improved industry standard" does not just represent improved performance, although that is also included. Although the classifications of "reduced radiation exposure", "reduced requirements" and "improved safety" may seem to be sub-categories of "improved industry standard", "reduced radiation exposure", "reduced requirements" and "improved safety" have been separately classified to better define a change or Case. Although some "improved industry standards" do result in increased requirements, where this is the case, the ASME consensus process has determined that the improvements in the industry standard more than justify the increased requirements.
- RRE - Reduced Radiation Exposure. Those action items that result in a reduction in radiation exposure from performing the requirements of the 1989 Edition of Section XI.
- RR - Reduced Requirements. Those action items that primarily result in an elimination of unnecessary requirements in the 1989 Edition or result in a reduction in costs or human resources. Reduced requirements are not a reduction in the level of safety, but rather are a redefinition of what the appropriate level of safety should be.
- M - Maintenance of the Code. General changes associated with maintaining the Code, minor changes, editorial changes and errata.

More than one classification may be used to better define a change or Case. However, the first classification listed in each row is considered the primary classification.

## Important Section XI SGWCS Code Changes and Code Cases
## 1989 Addenda through 1999 Addenda
(Note 1)

| Description of Code Change or Code Case: | Purpose/Benefit: | Classification: (See Note 2) |
|---|---|---|
| 1. A revision to the exemption criteria for Class 2 and 3 piping systems. This revision incorporated Code Case N-408-2 in the 1989 Addenda. | Expanded the exemptions for Class 2 and 3 piping systems to make all vessels exempt from examination when in exempt piping. It also identified that vessels with multiple openings exemptions are based on cumulative cross-section area of openings. | RR |
| 2. A revision to incorporate a sampling plan for inspection of component supports. This revision incorporated the provisions of Code Case N-491 in the 1990 Addenda. | This significantly decreases the number of piping supports to be examined, but increases the number of other component supports to be examined. | RR |
| 3. A revision to Table IWE 2500-1, Category E-C to add inspection requirements in the 1991 Addenda. | The revision adds requirements for ultrasonic thickness measurements of containment liner surface areas subject to accelerated degradation. | IIS |
| 4. A revision to IWL concerning corrosion and tension testing of wire strands in the 1991 Addenda. | The revision requires tendon wire and strands to be examined to determine the most severe location of corrosion. If corrosion has occurred, tension tests are to be performed on a sample of wires and strands with the most corrosion. | IS |
| 5. A revision to concrete examination requirements in the 1993 Addenda. | The revision makes IWL more consistent with Regulatory Guide 1.35. It adds examination and acceptance standards for concrete surfaces and tendon anchorage areas. It also adds acceptance criteria for tendon elongation. | IIS |
| 6. A revision to exempt welds or portions of welds in penetrations from examination. This revision incorporated the provisions of Code Cases N-198-1, N-332, and N-334 in the 1994 Addenda. | The revision eliminated examination that could not be performed. By making the code change, Owner's would no longer have to seek NRC approval of relief from the Code for these welds. | RR |
| 7. A revision to examination criteria for integrally welded attachments. This revision incorporated the provisions of Code Case N-509 in the 1995 Addenda. | The change modifies when examinations are to be performed and the method used. Attachments now only require examination when there is evidence of support damage. Class 1 now requires surface examinations instead of volumetric and Class3 examinations were changed from VT-3 to VT-1. | RR |
| 8. This revision incorporated the provisions of Code Case N-521 in the 1995 Addenda. | The change permits deferral of PWR nozzle welds to the end of the interval. It does not apply to the first interval. | IIS |
| 9. This revision incorporated the provisions of Code Case N-547 in the 1995 Addenda. | This revision eliminates the requirement for VT-1 examination of CRD housing bolts. | RR |
| 10. This revision incorporated the provisions of Code Case N-524 in the 1995 Addenda. | This revision eliminates the examination on longitudinal welds in piping except for the portion covered by the circumferential weld volumetric examination. | RR |
| 11. This revision incorporated the provisions of Code Case N-435-1 in the 1995 Addenda. | This revision allows surface examination in lieu of volumetric examination for vessel 1/5" thick or less. | RR |
| 12. This revision incorporated the provisions of Code Case N-323-1 in the 1997 Addenda. | This revision allows a one-sided surface examination in lieu of a two-sided examination or volumetric examination when only one side is accessible. | RR |
| 13. Code Case N-618, "Alternative Requirements for Nozzle Inner Radius Inspections for Class 1 Pressurizer and Steam Generator | The case allows the nozzle inner radius examinations to be discontinued | RR |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| Nozzles" | | |
| 14. Code Case N-609, "Alternative Requirements to Stress-Based Selection Criteria for Category B-J Welds" | The case allows the use of location and material type as well as stress to be used for selection of welds to be examined as an alternative to the stress-based criteria. | RR |
| 15. Code Case N-560, "Alternative Examination Requirements for Class 1, Category B-J Piping Welds" | The case allows the use of a probabilistic assessment to select welds to be examined. It is significant because it reduces the sample size from 25% to 10% of the B-J welds. | RR |
| 16. Code Case N-577, "Risk Informed Requirements for Class 1, 2, and 3 Piping, Method A" | The case allows the use of risk analysis to determine which welds to inspect and how often they should be inspected. | RR |
| 17. Code Case N-578, "Risk Informed Requirements for Class 1, 2, and 3 Piping, Method B" | The case allows the use of a panel of experts to use risk parameters to determine which welds to inspect and how often they should be inspected. | RR |
| 18. Code Case N-575, "Alternative Examination Requirements for Full Penetration Nozzle-to-Penetration Welds in Reactor Vessels with Set-on Type Nozzles" | The case provides an alternate (smaller) volume to be examined for set-on nozzles. | RR |
| 19. Code Case N-486, "Inservice Inspection, Repair, and Replacement Requirements for Class MC and Metallic Liners of Class CC Components" | This was an implementing case to provide IWE criteria while the Code revision containing the criteria was being reviewed by NRC for endorsement. | IIS |
| 20. Code Case N-478, "Inservice Inspection for Class CC Concrete Components of Light-Water Cooled Power Plants" | This was an implementing case to provide IWL criteria while the Code revision containing the criteria was being reviewed by NRC for endorsement. | IIS |

Notes:

1) Items listed in this table are the more important Section XI Subgroup Water Cooled Systems changes and Code Cases approved in the ten years from the 1989 Edition through the 1999 Addenda. Overall, during this time frame, individual actions which resulted in a published Code change, for which the Subgroup on Water Cooled Systems was responsible, numbered 77 (which includes the important actions separately listed in the table). In addition, Code Cases and Case revisions, for which the Subgroup on Water Cooled Systems was responsible, numbered 41 (which includes the important Cases separately listed in the table). These Code changes and Code Cases are broken down by primary classification as follows (using the classification in Note 2 below):

**Code Changes:**
Improved Safety (IS): 1
Improved Industry Standards (IIS): 40
Reduced Radiation Exposure (RRE): 0
Reduced Requirements (RR): 14
Maintenance of the Code (M): 22
Total Code Changes: 77

**Code Cases/Case Revisions:**
Improved Safety (IS): 0
Improved Industry Standards (IIS): 22
Reduced Radiation Exposure (RRE): 0
Reduced Requirements (RR): 17
Maintenance of the Code (M): 2
Total Code Cases and Case revisions: 41

In addition, due to the importance of reducing radiation exposure to personnel, 13 out of the 77 total Code changes and 9 out of the 41 Code Cases/Case Revisions resulted in a reduction of radiation exposure, even though the primary classification was not noted as Reduced Radiation Exposure in the overall totals noted above.

2) Code changes and Code Cases are classified using the following classification system and abbreviations:

- IS - Improved Safety. Those action items that have an obvious affect on plant safety, such as improving the assurance of pressure boundary integrity or reducing core damage frequency as determined from a risk approach.
- IIS - Improved Industry Standard. Improvements including, for example, new or better methods and processes, clarified or improved understanding of requirements due to Code changes, and changes to address industry experience. "Improved industry standard" does not just represent improved performance, although that is also included. Although the classifications of "reduced radiation exposure", "reduced requirements" and "improved safety" may seem to be sub-categories of "improved industry standard", "reduced radiation exposure", "reduced requirements" and "improved safety" have been separately classified to better define a change or Case. Although some "improved industry standards" do result in increased requirements, where this is the case, the ASME consensus process has determined that the improvements in the industry standard more than justify the increased requirements.
- RRE - Reduced Radiation Exposure. Those action items that result in a reduction in radiation exposure from performing the requirements of the 1989 Edition of Section XI.
- RR - Reduced Requirements. Those action items that primarily result in an elimination of unnecessary requirements in the 1989 Edition or result in a reduction in costs or human resources. Reduced requirements are not a reduction in the level of safety, but rather are a redefinition of what the appropriate level of safety should be.
- M - Maintenance of the Code. General changes associated with maintaining the Code, minor changes, editorial changes and errata.

More than one classification may be used to better define a change or Case. However, the first classification listed in each row is considered the primary classification.

# Important Section XI "Repair/Replacement Activity" Code Changes and Code Cases
# 1989 Addenda through 1999 Addenda
(Note 1)

| Description of Code Change or Code Case: | Purpose/Benefit: | Classification: (See Note 2) |
|---|---|---|
| 1. Requirements for repair of heat exchanger tubing by sleeving were added in the 1989 Addenda. | Adds an industry consensus standard on heat exchanger tube sleeving to repair degraded tubes. | IIS |
| 2. The half bead SMAW welding requirements were replaced with temper bead SMAW welding requirements in the 1990 Addenda. | Incorporate improved welding requirements when the required postweld heat treatment can not be performed. The added temper bead welding requirements resulted in removal of less of the initial butter pass, and less in-process examination, therefore reducing repair time and radiation exposure | IIS and RRE |
| 3. IWL-4000 for repair of concrete containments and IWL-7000 for replacement of post-tensioning systems in concrete containments were added in the 1991 Addenda. | Adds industry consensus standards on repair and replacement activities on concrete containments. | IIS |
| 4. The 1991 Addenda combined IWA-4000 (Repairs) and IWA-7000 (Replacements) and the 1995 Addenda eliminated the distinction between Repairs and Replacements and restructured the Repair/Replacement Activities. | These changes substantially improved the usability of Section XI for Repair/Replacement Activities. | IIS |
| 5. Requirements for repair welding using the automatic or machine gas tungsten-arc welding (GTAW) temper bead technique were added in the 1991 Addenda. This change incorporates Code Case N-432. | This change provides an industry consensus standard for use of automatic or machine gas tungsten arc welding (GTAW) as an alternative to shielded metal arc welding (SMAW) for performing temper bead welding. It is usually the preferred technique for performing temper bead repairs. | IIS |
| **6. The exemption for replacements NPS 1 and less was replaced with an alternative set of requirements in the 1992 Addenda. Class 1 items larger than the plant makeup capability, heat exchanger tubing, and sleeves and welded plugs used for heat exchanger tubing must meet all Code requirements. The 1991 Addenda added heat exchanger tubing, sleeves and plugs as not exempt.** | **Section XI determined it was not appropriate to exempt replacement of items, the failure of which would be defined as a LOCA. Industry use of the exemption and Section XI interpretations may not have been assuring these small items would function as designed. Use of the alternative, or use of full Code requirements, was intended to assure these small items will function as designed after replacement.** | IS |
| 7. Requirements for rerating components and systems were added in the 1995 Addenda. | Adds industry consensus standards for rerating of items, in the absence of a consistent industry approach. | IIS |
| 8. For repair/replacement activities involving design or configuration changes, IWA-4000 was revised in the 1995 Addenda and the 1996 Addenda to clarify that the Owner is required to revise or update Owner's Requirements, Design Specifications and Design Reports. The revisions or updates are required to be traceable to and from the original record or report to provide a record of the current status of the item. | Some Owners and Repair Organizations were not maintaining the design of items to the Construction Code requirements, nor maintaining these noted documents to provide a current status of the design of an item, as intended by Section XI. These changes clarify the requirements to assure consistent implementation by the industry. | IIS |
| 9. Expanded provisions on reconciliation were added in the 1995 Addenda and the 1996 Addenda. Case N-554, "Alternative Requirements for Reconciliation of Replacement Items, Section | Section XI has required, since the addition of Replacement rules, a reconciliation of use of Later Editions or Addenda of the Construction Code when components, parts, and materials are replaced. This change provides | IIS and RR |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| XI, Division 1" contains similar provisions. | an industry consensus standard with details as to how this reconciliation is to be performed and for some items, such as components, results in a reduction what much of the industry had perceived as required. | |
| 10. The alternative requirements for small items was revised in the 1995 Addenda to include repair of small items. Case N-544, "Repair/Replacement of Small Items, Section XI, Division 1" contains similar provisions. | Prior to the 1995 Addenda, Section XI provided an exemption, or alternative less restrictive requirements, for NPS 1 and smaller replacement items and installation thereof. Repairs were not similarly exempted. Therefore, a repair to an item was subject to more restrictive requirements than replacing the item. This change allows application of the alternative requirements for replacement to weld repairs of small items, thereby reducing requirements and costs. | RR |
| 11. IWA-4451 was added in the 1995 Addenda. This change addressed requirements for obtaining and installing Helical Coil Threaded Inserts. This action incorporated Code Case N-496 | This change allows Owner's to perform repairs to defective threaded connections without replacing the item or performing extensive remachining. The rules provide for an equivalent level of safety, while at the same time allowing for more economical repairs. In addition, based on the fact that the repairs can be completed in a more expeditious manner, dose will be lower. | IIS and RRE |
| 12. Qualification and performance requirements to permit underwater welding for repair and replacement activities on P-No. 8 and P-No. 4X materials were added in the 1996 Addenda. Provisions for underwater welding of P-No. 1 materials were added in the 1997 Addenda. These changes incorporate Code Case N-516 and Case N-516-1. | Adds industry consensus standards for performing underwater welding. These provisions are useful for underwater work in spent fuel pools and service water systems. | IIS and RRE |
| 13. Alternative provisions for replacement of snubbers and pressure relief valves were added in the 1996 Addenda. This change incorporates Case N-508-1. | This change provides alternative rules to those stated in IWA-4000 when snubbers and pressure relief valves are removed only for testing and are then rotated with snubbers and relief valves currently installed within the Section XI boundary. The alternative provisions reduce the documentation requirements and costs for these numerous and routine replacements. | RR |
| 14. IWA-4000 provisions were revised in the 1997 Addenda to include the addition of new systems to an existing nuclear plant. | Prior to this change, Owners were required to address addition of new systems with the NRC, usually using newer Codes. This change allows use of Section XI to install a new system using the Construction Code already used in the plant for similar systems, saving considerable cost and utilizing existing warehouse stock. | IIS and RR |
| 15. Alternative requirements allowing Owners to transfer welding procedure qualifications was incorporated in the 1997 Addenda. This incorporates Case N-573. | The change allows Owners to use welding procedure qualifications performed and documented by other Owners, resulting in cost savings. | RR |
| 16. An alternative to use mechanical clamping devices for temporary repairs of Class 2 and 3 piping was included in the 1997 Addenda. This change incorporates Case N-523-1. | This change provides an alternative industry consensus standard for temporary clamping devices to provide structural integrity of degraded piping without performing standard repair or replacement. The use of the clamping device can preclude the need for forced plant shutdowns. | IIS, RRE and RR |
| **17. Provisions for a system leakage test as an alternative to the previously required hydrostatic pressure tests following repair/replacement activities were added in the 1999** | **This change allows a system leakage test at operating pressure to be used in lieu of a hydrostatic test following repair and replacement activities. It results in reduced costs and critical path time. For systems** | **RR and RRE** |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| **Addenda. This change incorporates Code Case N-416-1.** | **in radiological controlled areas of the plant, this can result in significant reductions in radiological exposures to plant personnel.** | |
| **18. Case N-606, "Similar and Dissimilar Material Welding Using Ambient Temperature Machine GTAW Temper Bead Technique, Section XI, Division 1"** | **This Case provides specific repair of BWR control rod drive stub tubes in the reactor pressure vessel using ambient temperature GTAW temper bead technique without the Code required elevated preheat and post weld temperature soak. This repair precludes the draining of the RPV, saving critical path outage time, money and radiation exposure.** | **RR and RRE** |
| **19. Case N-576, "Repair of Class 1 and 2 SB-163, UNS N06600 Steam Generator Tubing, Section XI, Division 1" This Case provides new rules for repair of SB-163, UNS N06600 steam generator tubing by using a laser beam weld (LBW) deposit on the inside surface of the tubing.** | **Approves an industry consensus standard to repair degraded tubes, saving the cost and radiation exposure to replace a steam generator, or extending the time frame when replacement is required.** | **IIS and RRE** |
| **20. Case N-569, "Alternative Rules for Repair by Electrochemical Deposition of Class 1 and 2 Steam Generator Tubing, Section XI, Division 1" This Case provides new rules for electrochemical deposition of a nickel-base alloy on the inside surface of degraded areas of Class 1 and 2 steam generator tubing.** | **Approves an industry consensus standard to repair degraded tubes, saving the cost and radiation exposure to replace a steam generator, or extending the time frame when replacement is required.** | **IIS and RRE** |
| **21. Case N-562, "Alternative Requirements for Wall Thickness Restoration for Class 3 Moderate Energy Carbon Steel Piping, Section XI, Division 1"** | **This Case provides an industry consensus standard for adding localized weld overlay on the outside of piping for the purpose of restoring degraded pipe wall thickness, precluding or deferring piping replacement.** | **IIS and RR** |
| **22. Case N-561, "Alternative Requirements for Wall Thickness Restoration of Class 2 High Energy and High Energy Class 3 Carbon Steel Piping, Section XI, Division 1"** | **This Case provides an industry consensus standard for adding localized weld overlay on the outside of piping for the purpose of restoring degraded pipe wall thickness, precluding or deferring piping replacement.** | **IIS and RR** |
| 23. Case N-557, "In-Place Dry Annealing of a PWR Nuclear Reactor Vessel, Section XI, Division 1" | This Case provides an industry consensus standard for performing in-place annealing of a PWR reactor pressure vessel to improve beltline material toughness subsequent to radiation induced embrittlement. | IIS |
| 24. Case N-528, "Purchase, Exchange, or Transfer of Material Between Nuclear Plant Sites, Section XI, Division 1" | This Case permits use of Code materials supplied by other Owners. Current Section XI reference to the Construction Code prohibits plants constructed to Section III from using Code materials furnished by Owners not possessing a Section III Certificate (N-type or QSC). This can result in considerable cost savings and critical path time reductions when another Owner has the needed materials in stock. | RR |
| 25. Case N-517, "Quality Assurance Program Requirements for Owners, Section XI, Division 1" | Current Section XI reference to the Construction Code prohibits Owners from performing some of the activities that Section III limits to Certificate Holders only, such as qualifying Code material manufacturers and suppliers. This Case provides specific activities an Owner can perform and allows an Owner to use these provisions without possessing a Certificate of Authorization. This results in cost savings and additional sources for | RR |

| Description of Code Change or Code Case: | Benefit: | Classification: (See Note 2) |
|---|---|---|
| | obtaining materials. | |
| 26. Case N-504, "Alternative Rules for Repair of Class 1, 2, and 3 Austenitic Stainless Steel Piping, Section XI, Division 1" | This Case provides an industry consensus standard for acceptance of flaws in austenitic piping by depositing full circumferential weld overlay to increase pipe wall thickness rather than by reducing the size of the flaw to meet the acceptance criteria, thereby precluding or deferring piping replacement. | IIS and RR |
| 27. IWA-4223 was revised in the 1999 Addenda to allow Owners to obtain components to an earlier Construction Code using reconciliation instead of having to meet all requirements of the original Construction Code. This action incorporated Code Case N-567. | The 1995 Addenda permitted the use of earlier Editions and Addenda for obtaining components provided all technical requirements of the original Construction Code were met. By allowing the use of earlier Editions and Addenda with reconciliation versus meeting all requirements, the Code provides flexibility to use existing items in the Owner's or manufacturer's warehouses. This results in lower cost with no reduction in safety. | RR |

Notes:

1) Items listed in this table are the more important Section XI Repair/Replacement Activity changes and Code Cases approved in the ten years from the 1989 Edition through the 1999 Addenda. Overall, during this time frame, individual actions which resulted in a published Code change, for which the Subgroup on Repairs, Replacements and Modifications was responsible, numbered 68 (which includes the important actions separately listed in the table). In addition, Code Cases and Case revisions, for which the Subgroup on Repairs, Replacements, and Modifications was responsible, numbered 28 (which includes the important Cases separately listed in the table). These Code changes and Code Cases are broken down by primary classification as follows (using the classification in Note 2 below):



**Code Changes:**
Improved Safety (IS): 1
Improved Industry Standards (IIS): 40
Reduced Radiation Exposure (RRE): 0
Reduced Requirements (RR): 15
Maintenance of the Code (M): 12
Total Code Changes: 68

**Code Cases/Case Revisions:**
Improved Safety (IS): 0
Improved Industry Standards (IIS): 17
Reduced Radiation Exposure (RRE): 0
Reduced Requirements (RR): 10
Maintenance of the Code (M): 1
Total of 21 new Code Cases and 7 Case revisions: 28

Of the 68 Code changes, 9 of them were incorporations of Code Cases counted in the total of 28.

In addition, due to the importance of reducing radiation exposure to personnel, 1 out of the 68 total Code changes and 8 out of the 28 Code Cases/Case Revisions resulted in a reduction of radiation exposure, even though the primary classification was not noted as Reduced Radiation Exposure in the overall totals noted above.

2) Code changes and Code Cases are classified using the following classification system and abbreviations:

- IS - Improved Safety. Those action items that have an obvious affect on plant safety, such as improving the assurance of pressure boundary integrity or reducing core damage frequency as determined from a risk approach.
- IIS - Improved Industry Standard. Improvements including, for example, new or better methods and processes, clarified or improved understanding of requirements due to Code changes, and changes to address industry experience. "Improved industry standard" does not just represent improved performance, although that is also included. Although the classifications of "reduced radiation exposure", "reduced requirements" and "improved safety" may seem to be sub-categories of "improved industry standard", "reduced radiation exposure", "reduced requirements" and "improved safety" have been

separately classified to better define a change or Case. Although some "improved industry standards" do result in increased requirements, where this is the case, the ASME consensus process has determined that the improvements in the industry standard more than justify the increased requirements.

- **RRE** - Reduced Radiation Exposure. Those action items that result in a reduction in radiation exposure from performing the requirements of the 1989 Edition of Section XI.
- **RR** - Reduced Requirements. Those action items that primarily result in an elimination of unnecessary requirements in the 1989 Edition or result in a reduction in costs or human resources. Reduced requirements are not a reduction in the level of safety, but rather are a redefinition of what the appropriate level of safety should be.
- **M** - Maintenance of the Code. General changes associated with maintaining the Code, minor changes, editorial changes and errata.

More than one classification may be used to better define a change or Case. However, the first classification listed in each row is considered the primary classification.

## Important Section XI "SG Liquid Metal Cooled Systems (Division 3)" Code Changes and Code Cases 1989 Addenda through 1999 Addenda

(Note 1)

| Description of Code Change or Code Case: | Purpose/Benefit: | Classification: (See Note 2) |
|---|---|---|
| 1. New Subsection IME was incorporated into Division 3 (1994 Addenda) which provides rules and requirements for inservice inspection, repair, and replacement of Class MC pressure retaining components and their integral attachments and metallic shell liners and penetrations for Class CC containments. | Adds containment ISI rules for liquid metal cooled operating plants. For example, the United States, Department of Energy (DOE) Fast Flux Text Facility was designed and built to Section III and satisfactorily completed a NRC and ACRS licensing review. It performs ISI as well as containment integrity testing to 10CFR50, Appendix J and needs Subsection IME to document and control future ISI. The reactor is currently on hot standby pending DOE direction for restart. Additionally, Division 3 guidelines are utilized by other international operating reactors, e.g., Japanese MONJU. | IS |
| 2. New rules were provided in Division 3 via 1990 Addenda for detection of water/steam leakage through the sodium interface for Class 1, 2, and 3 components in liquid metal systems. | Incorporates liquid metal cooled reactor operating criteria into the code for leak detection. | IS |
| 3. A revision was made to Division 3 IMA-2300, Appendix VII to adopt the increased provisions for qualification of ultrasonic examination personnel that were added to Section XI, Division 1, in the 1988 Addenda. The change includes specific requirements for UT training and adds requirements for qualification of an NDE Instructor. | Incorporates industry standards for qualification of ultrasonic examination personnel. | IIS |
| 4. A revision was made to IMA-4110, IMA-4111, IMA-4120, IMA-4121, IMA-4122 in Division 3 which expands and clarifies the exemptions from the scope of the repair and replacement rules. The revision also clarifies that the Owner may determine by evaluation that a replacement activity will not affect pump or valve performance parameters. This revision also deletes the exemption from the provisions of IMA-4000 for NPS 1 and smaller items in systems that contain liquid metal or liquid metal cover gas. The revision adds alternative, less restrictive provisions for items in small diameter systems other than systems that contain liquid metal or liquid metal cover gas, to provide assurance that the item will function as designed. The reduced provisions are no longer applicable to Class 1 items larger than the makeup capability limit for the plant, nor for heat exchanger tubing or sleeves or welded tube plugs for heat exchanger tubing. This change is consistent with changes to Division 1 in the 1992 Addenda. | Incorporates changes made in Division 1 but identifies additional criteria for liquid metal cooled plants, e.g., deletes the exemption for NPS 1 and smaller items in systems that contain liquid metal or liquid metal cover gas. | IS |

| | | |
|---|---|---|
| 5. New IMA-9000 Glossary was incorporated into Division 3 via 1995 Addenda. | Adds new glossary required to incorporate definitions utilized throughout Division 3. It contains definitions which are unique to liquid metal cooled operating plants. | IIS |

Notes:

1) Items listed in this table are the more important Section XI SG Liquid Metal Cooled Systems (Division 3) changes and Code Cases approved in the ten years from the 1989 Edition through the 1999 Addenda. Overall, during this time frame, individual actions which resulted in a published Code change, for which the Subgroup on Liquid Metal Cooled Systems (Division 3) was responsible, numbered 21 (which includes the important actions separately listed in the table). In addition, Code Cases and Case revisions, for which the Subgroup on Liquid Metal Cooled Systems (Division 3) was responsible, numbered 0 (which includes the important Cases separately listed in the table). These Code changes and Code Cases are broken down by primary classification as follows (using the classification in Note 2 below):



**Code Changes:**
Improved Safety (IS): 3
Improved Industry Standards (IIS): 4
Reduced Radiation Exposure (RRE): 0
Reduced Requirements (RR): 0
Maintenance of the Code (M): 14
Total Code Changes: 21

**Code Cases/Case Revisions:**
Improved Safety (IS): 0
Improved Industry Standards (IIS): 0
Reduced Radiation Exposure (RRE): 0
Reduced Requirements (RR): 0
Maintenance of the Code (M): 0
Total Code Cases and Case revisions: 0

In addition, due to the importance of reducing radiation exposure to personnel, 0 out of the 21 total Code changes and 0 out of the 0 Code Cases/Case Revisions resulted in a reduction of radiation exposure, even though the primary classification was not noted as Reduced Radiation Exposure in the overall totals noted above.

2) Code changes and Code Cases are classified using the following classification system and abbreviations:

- IS - Improved Safety. Those action items that have an obvious affect on plant safety, such as improving the assurance of pressure boundary integrity or reducing core damage frequency as determined from a risk approach.

IIS - Improved Industry Standard. Improvements including, for example, new or better methods and processes, clarified or improved understanding of requirements due to Code changes, and changes to address industry experience. "Improved industry standard" does not just represent improved performance, although that is also included. Although the classifications of "reduced radiation exposure", "reduced requirements" and "improved safety" may seem to be sub-categories of "improved industry standard", "reduced radiation exposure", "reduced requirements" and "improved safety" have been separately classified to better define a change or Case. Although some "improved industry standards" do result in increased requirements, where this is the case, the ASME consensus process has determined that the improvements in the industry standard more than justify the increased requirements.

RRE - Reduced Radiation Exposure. Those action items that result in a reduction in radiation exposure from performing the requirements of the 1989 Edition of Section XI.

RR - Reduced Requirements. Those action items that primarily result in an elimination of unnecessary requirements in the 1989 Edition or result in a reduction in costs or human resources. Reduced requirements are not a reduction in the level of safety, but rather are a redefinition of what the appropriate level of safety should be.

M - Maintenance of the Code. General changes associated with maintaining the Code, minor changes, editorial changes and errata.

More than one classification may be used to better define a change or Case. However, the first classification listed in each row is considered the primary classification.

| **Important ASME OM Code Revisions:<br>1990 – Present** |
|---|
| **Improved Safety (IS)** |
| 1. *ISTB 1.3, ISTB 3, ISTB 4, ISTB 5, ISTB 6, and ISTB 7; Comprehensive Pump Test*<br>2. *ISTC 4.5, and Appendix II [Condition Monitoring];ISTC 4.5, ISTC 6.2, and Appendix E [Inservice Exercising for Check Valves]*<br>3. *ISTD 1.4 and 8 and Appendix F; Service Life Monitoring of Dynamic Restraints* |
| **Reduced Radiation Exposure (RRE)** |
| 1. *ISTC 1.3, 2, & 4.5.4; Non-Intrusive Techniques*<br>2. *ISTC 4.5.4(c), 4.5.6, & 6.2; Disassembly Examination by Sampling Program*<br>3. *ISTC 4.5.6, 4.5.7 & 6.2(f); Series Check Valves*<br>4. *ISTC 1.2, Exclusions* |
| **Improved Industry Standards (IIS)** |
| 1. *ASME OM Code Reformat*<br>2. *ISTA,Appl - Correct PTC-25/API-527 references*<br>3. *ISTB 1.3, & 6 Analyses & evaluation of pumps*<br>4. *ISTB 6.1, & 6.2 Trending and Acceptance Criteria*<br>5. *ISTB 4.7 Data Collection*<br>6. *ISTB 5.2.1 ISTB 5.2.3 Pump Testing Methods*<br>7. *OM-4 Snubbers*<br>8. *ISTD 1, 3.2, 4.3, 4.4, 5.2, 5.3.4, 6, 7, 8, & Appendices C, E, F, G*<br>9. *ISTD 1.4, 1.12, 6 & Appendix G-Unacceptable Snubbers*<br>10. *ISTD 1.4, 5.2, 7, Appendix D & E Preservice Test Parameters*<br>11. *ISTD 3.4 and Appendix H Test Parameters and Methods*<br>12. *ISTD 1.4, ISTD 7.7(b), ISTD 7.7.1, ISTD 7.8, Appendix E Inservice Operational Readiness Testing*<br>13. *ISTD 1.4, ISTD 7.2.5, ISTD 8.4 Snubber Subcomponents*<br>14. *ISTD 6.52-1, 7 ,7.4, 7.5.1, 7.6.2, 8.2 Refueling Outage Visual Examination of Snubbers* |

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***NOTE: IDENTICAL LETTERS WERE TRANSMITTED TO COMMISSIONERS DIAZ, MCGAFFIGAN, DICUS AND MERRIFIELD***

June 16, 1999

Chairman Shirley Jackson
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Re: Federal Register: April 27, 1999 Vol. 64, No. 80
Industry Codes and Standards; Amended Requirements

Dear Chairman Jackson:

The American Society of Mechanical Engineers (ASME) wishes to bring to your attention its position on the above referenced proposed rulemaking on the elimination of the 120-month requirement for licensees to update their inservice inspection (ISI) and inservice testing (IST) programs.

ASME believes that the benefits gained in implementing the 120-month update significantly outweigh the associated costs. Updating focuses on an evaluation of the entire program to later ASME Code requirements and forms the basis for making necessary changes and enhancements to ISI and IST programs.

It is also our position that the proposed change to eliminate this update requirement and to establish the 1989 Edition of the ASME Boiler and Pressure Vessel (BPV) Code, Section XI, as the baseline (i.e. latest mandatory) edition/addenda is contrary to the spirit of Public Law 104-113 "National Technology Transfer and Advancement Act of 1995." This Act requires federal agencies to make greater utilization of technical consensus standards within the constraints of fulfilling their statutory obligations. While we recognize that the NRC proposed change would include endorsement of later editions/addenda for voluntary implementation by licensees, we are concerned over the long-term implications of selective voluntary updates. The continuous maintenance of ASME Boiler and Pressure Vessel Code Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components and ASME OM-Code for Operation and Maintenance of Nuclear Power Plants enable the incorporation of technological advances that provide cost benefit to the industry while maintaining safety; the proposed rulemaking amendment would weaken the benefits derived from the technical consensus process. ASME's continuous maintenance and improvement of these codes and standards have been based on the assumption of a required 120-month update.

ASME's detailed comments have been submitted in accordance with the Federal Register notice; a copy is attached. In view of the significance of this proposed rulemaking amendment, ASME decided it was important to communicate our position to the Commission. It is our position that maintaining the 120-month update will provide for greater cost benefits to the industry, facilitate NRC's regulatory oversight, and better serve the common objective of public safety.

ASME would be pleased to continue discussion on this proposed amendment as and when deemed appropriate. We thank you for your consideration.

Sincerely,

Robert E. Nickell

Robert E. Nickell

Cc: David L. Belden, ASME Executive Director
June Ling, ASME Assoc. Exec. Director, C&S
Donald R. Frikken, ASME Sr. Vice President, C&S

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June 16, 1999

The Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attn: Rulemakings and Adjudications Staff

Re: Federal Register Notice (Volume 64, Number 80 April 27, 1999) Solicitation of Public Comments Regarding Proposed Supplement To The Proposed Rule Published On December 3, 1997 (62 FR 63892) That Would Eliminate The 120 Month Requirement For Licensees To Update Their Inservice Inspection And Inservice Testing Programs

To Whom It May Concern:

The American Society of Mechanical Engineers (ASME), also known as ASME International, is a not-for-profit engineering society focused on technical, educational, and research issues. There are 125,000 ASME members worldwide; there are no corporate members. ASME conducts one of the world's largest technical publishing operations, holds some 30 technical conferences and 200 professional development courses each year, and sets industrial and manufacturing codes and standards used throughout the world; there are ASME accredited manufacturers in 58 countries.

The enclosure provides the position of the American Society of Mechanical Engineers, which is in response to the supplement to the proposed rule.

ASME opposes the NRC supplement to the proposed rule for the reasons summarized below and as expanded upon in the enclosure:

- The benefits gained in implementing the 120 month update outweigh the cost of making the update.
- The Codes are living documents that are moving from prescribed repetitive inspection and tests to a more risk-informed and performance-based approach that both the NRC and ASME are moving toward as a high priority.
- The ASME standards development process and system provide a multiplier effect that captures all Code changes and collective committee experience in direct support of the 120-month update.
- Elimination of the 120-month update is considered contrary to the spirit of the intended implementation of Public Law 104-113 and OMB A-119.

The 120-month update has served as a mechanism for licensees to keep their ISI and IST programs consistent with current improvements in technology reflected in codes and standards, including improvements affecting health and safety and increased efficiencies, and ongoing assessment of the process by NRC. It provides for systematic implementation of safety enhancements with a minimum of bureaucratic involvement. Updating focuses on an evaluation of the entire program to later code requirements, identifies errors and deficiencies and forms the basis for making corrections and enhancements to ISI & IST Programs. It reflects the latest edition and addenda to the ASME Codes endorsed by the NRC. It will maintain a more current,

consistent and uniform standard for the entire industry that will minimize separate submittals and evaluations on a case-by-case basis between utilities and NRC staff.

The effect of savings from many Code revisions over several Code editions must be taken into account including, for example, the cumulative significant beneficial effect of many small and subtle changes that improved safety and reduced personnel exposure to radiation. Updating to the latest Code requirements will result in a net reduction in work required, personnel exposure and continue to increase economic benefits over the remaining life of the plant.

Sincerely,

James A. Perry

James A. Perry, Vice President
Nuclear Codes and Standards

Gerald M. Eisenberg

Gerald M. Eisenberg, Director
Nuclear Codes and Standards

Enclosure

Cc with enc
D.A.. Powers, Chairman, USNRC-ACRS
Dr. W. D. Travers, Executive Director of Operations-USNRC
Richard E. Feigel, ASME Sr. VP-C&S
Domenic A. Canonico, Chairman ASME B&PV Committee
Members, ASME Board on Nuclear Codes and Standards
Members, ASME Council on Codes and Standards
June Ling, ASME AED C&S

**ASME RESPONSE TO SUPPLEMENT TO**
**PROPOSED RULE PUBLISHED DECEMBER 3, 1997: 10CFR50.55a**
**June 16, 1999**

## Background

The Nuclear Regulatory Commission is publishing a supplement to the proposed rule published on December 3, 1997 (62 FR 63892) that would eliminate the requirement for licensees to update their inservice inspection (ISI) and inservice testing (IST) programs beyond a baseline edition and addenda of the ASME Boiler and Pressure Vessel Code (BPV Code).

The proposed rule would establish the **1989 Edition** of ASME BPV Code, Section XI, as the baseline Code **for IST requirements** (except for design and access provisions and preservice examination requirements) for pumps and valves that are classified as ASME Code Class 1, 2, or 3 components in currently operating nuclear power plants. As required by 10 CFR 50.55a(b)(viii), references in ASME BPV Code Section XI to OM standards, Parts 4, 6, and 10 will mean the OMa-1988 Addenda to the OM-1987 Edition. The proposed rule would also establish the **1989 Edition** of ASME BPV Code, Section XI as the baseline Code **for ISI requirements** for components (including supports) classified as ASME Code Class 1, 2, or 3.

The NRC proposes to **eliminate the requirement to update ISI and IST programs every 120 months** for licensees applying the baseline or later editions and addenda of the ASME Code incorporated by reference in the regulations. As proposed, licensees may update their ISI and IST programs to subsequent Code editions or addenda that have been incorporated by reference in the regulations **in their entirety** without prior NRC approval when implemented in accordance with the regulations. A licensee intending to implement only a portion of a subsequent Code edition or addenda incorporated by reference in the regulations would be required to obtain prior NRC approval by demonstrating that the specific portion of the edition or addenda presents an acceptable level of quality and safety, and that all related requirements are satisfied.

The NRC proposes that the baseline Code for ISI requirements for metal and concrete containment (Classes MC and CC) components and their integral attachments be the 1992 Edition with the 1992 Addenda of Subsections IWE and IWL of Section XI of the ASME BPV Code. Finally, the proposed rule would require that ASME Code Class 1, 2, or 3 components conform to the requirements in Appendix VIII of Section XI of the ASME BPV Code, 1995 Edition with the 1996 Addenda.

The NRC believes that the overall level of safety achieved by adherence to a baseline edition or addenda of the ASME Code incorporated by reference in the regulations would be sufficient and adequate, and that unnecessary burden might be placed upon licensees by the required updating of their ISI and IST programs. The NRC also believes that the establishment of a baseline edition and addenda of the ASME Code for ISI and IST requirements would ensure adequate protection of public health and safety without periodic updating of ISI and IST programs at nuclear power plants.

## ASME Response

ASME opposes the NRC supplement to the proposed rule described above for the following reasons:

1. **The benefits gained in implementing the 120 month update outweigh the costs of making the update**
   - The Federal register notice cites a cost of approximately $200,000 for the 120 month update for each licensee, or $20,000 per year. This is not a significant cost when you consider the potential number of relief requests if the update were eliminated.

By baselining the code to the 1989 Edition, licensees will be forced to submit numerous relief requests that will be required to implement portions of later editions of the Code. This will result in use of greater licensee and NRC resources than if the most recent Edition of the Code were imposed in the regulations.

- Representatives of some utilities have requested elimination of the120 month update based on its expense. From an administrative view, the update would clearly call for an increase in the budget for a particular department once every 10 years. This would appear attractive to eliminate. However, the effect of savings from many Code revisions over several Code editions must be taken into account. Updating to the latest Code requirements will result in a net reduction in work required, personnel exposure and economic benefits that will continue over the remaining life of the plant. For an example, a code action to reduce inservice inspection (ISI) of Class B-J piping welds could save several hundred thousand dollars per plant.
- Since the 1989 Edition of the Boiler and Pressure Vessel Code (the most recent edition referenced in the regulation), there have been numerous revisions and Code Cases that have been characterized as economically beneficial to the utilities. The contributions to safety are also significant. A primary justification for the revisions and Code Cases is to achieve ALARA objectives. Examples follow:
  - Cases N-458-1 and N-485-1 permit surface examination of painted surfaces. This reduces personnel exposure by eliminating the need for paint removal before a surface examination, and repainting after.
  - Case N-463-1 provides criteria for analytical evaluation and acceptance of flaws that would otherwise result in component repair or replacement, avoiding exposure of personnel engaged in repair/replacement activities.
  - Case N-481 provides criteria for analytical evaluation and acceptance of flaws, that would otherwise require nondestructive examination. Thus, exposure of personnel engaged in repair/replacement activities is avoided.
  - Case N-480, which introduces examination and analytical evaluation methods for pipe wall thinning due to single-phase erosion and corrosion, was initiated to address safety concerns. It has recently been superseded by Case N-597.
  - Case N-557, which provides criteria for in-place dry annealing of a PWR reactor vessel, also addresses safety concerns.
  - Case N-560 permits reduction in examination of Class 1 Category B-J piping welds from 25% to 10%, provided a specified risk-importance ranking selection process is followed. The selection process has been shown to improve safety, because it focuses examinations on critical areas in place of the current shotgun approach. The reduction also reduces NDE personnel exposure
  - Cases N-509, N-524, and N-547 reduce examinations with reduction in plant personnel exposure.
- Updating will maintain a more current, consistent and uniform standard for the entire industry that will minimize separate submittals and evaluations on a case by case basis between utilities and NRC staff.
- Updating to the more recent ASME codes would provide for more cost-effective inspections and tests at lower occupational exposure.
- It took over 9 years for the NRC to produce an update to 10CFR50.55a to address later editions of ASME Section III, Section XI, NQA-1 and to introduce a baseline for the OM Code for mandatory requirements in the regulation. With voluntary updates, it would appear that there would be a reduction in emphasis on evaluation and less timely endorsement of Code changes by NRC staff.

- Since major updates of the ISI & IST programs underwent major improvements at the time of the update, a disparity over time will occur if these updates are not required in the future. Updating focuses on an evaluation of the entire program to later code requirements, identifies errors and deficiencies and forms the basis for making corrections and enhancements to ISI & IST Programs.
- The update provides for standardization and consistency in implementation of requirements. If future changes to the ASME Code become voluntary, the impact on changes to the range of code editions and addenda applied by licensees is expected to be great. This will have a negative impact due to inconsistent implementation, and lack of uniformity and consistency in verifying conformity.

2. **The Codes are living documents that are moving from prescribed repetitive inspection and tests to a more risk-informed and performance-based approach that both the NRC and ASME are moving toward as a high priority.**

   One of the arguments in support of the proposed NRC action is that the Code is "Mature". In a sense this is true, in terms of years since inception; however, Section XI is in the midst of a change in philosophy and scope, moving from prescribed repetitive inspections to risk-informed programs. Lessons learned from the pilot applications are being used to support Code Case actions. Section XI inspection requirements were originally based on fossil service experience, and recent revisions to the Code implement the lessons learned in over 25 years of nuclear power plant operating experience. Many of these have been implemented since the 1989 edition, and others are in development. The NRC has not provided a basis to support the contention that the 1989 Code is "mature" for current application.

   The Code is a **living document** and it would be improper to ignore that fact by effectively locking the Regulations into one edition and addenda.

3. **The ASME standards development process and system provide a <u>multiplier effect</u> that captures all Code changes and collective committee experience in direct support of the 120 month update**
   - Operational experience has, and will continue to be incorporated in ASME Code revisions to assure appropriate implementation of safety provisions and ALARA considerations.
   - A broad-based group of experts collectively produce Code changes using the consensus process.
   - Research resources and new technology are available as input to the committee.
   - User feedback to the committee on operating experience, application and lessons learned results in needed refinement and adjustment to the Code. There has been a cumulative, significant, beneficial effect of small and subtle revisions that improved safety and reduced personnel exposure to radiation. These were related not only to the reductions in the number and extent of examinations, but also to new methods for performing repairs and flaw analysis.
   - The committee process provides continuous addenda & edition updates. Thus, with timely endorsement, the120 month update ensures that licensees reevaluate and update ISI/IST programs to reflect experience and Code improvements from Code application. With more timely NRC endorsement of later code editions and addenda in the future, licensees should be encouraged to update their ISI and IST programs on a more frequent basis; e.g. at the time of each new edition. This would reduce the number of changes being made at a given time and would reduce the administrative cost burden of making the update. With elimination of the120 month update, the owners groups, NEI and EPRI would continue to approach the NRC staff directly for relief on behalf of their utility members. A net increase on the number and detail of licensee submittals associated with ISI & IST would be expected. The NRC staff would deal with the utilities one-on-one more often on issues that to this point have been resolved by code committee action. While called a 'voluntary update, each

request would be scrutinized and each applicant would need to provide justification for adoption of portions of code. This would have the affect of skewing individual ISI and IST programs in a manner that fosters increased inconsistency in implementing Code requirements as time passes with reduced oversight by NRC. There is a risk that picking and choosing of selected revisions may result in omission of correlative revisions or requirements, introducing ambiguities.

- The staff decisions on these one-at-a-time issues would not receive the same scrutiny as that given to changes in the Regulation. This will have the effect of diminishing the role of the consensus standards development process.
- The NRC position under IX Backfit Analysis of this Supplemental Proposed Rule supports the endorsement of the later ASME Code by the statement that "the NRC has reviewed those comments and has concluded that neither NUBARG nor NEI raises legal concerns that would alter the previous legal conclusion that the Backfit Rule does not require a backfit analysis of routine updates to incorporate new ASME Code ISI and IST requirements."
- Elimination of 120 month update could have major detrimental impact on the committee infrastructure. By baselining the 1989 Edition of the BPV Code, there will be little incentive for US utilities to provide resources to support further Code revisions. It is questionable whether US utilities, manufacturers, laboratories, insurance companies, consultants, designer-constructors and others would maintain significant committee participation, except to pursue specific needs. Innovation would be discouraged. This contrasts with the experience of the last 30 years when Code Committees, through an established infrastructure, produced changes to the Code which relied upon broad based research and operating experience.
- The update provides for a continuous improvement process. Initially the Code was written in a conservative manner until more experience and advancements in technology were realized. Changes that were made to eliminate or reduce certain examinations served to reduce occupational exposure in certain areas. With regard to the OM Code, the current edition (1998) provides a baseline for significant improvements in testing efficiency through the use of risk insights and operational experience. This provides for a more effective use of resources and provides for more cost-effective inspection. This becomes significant with initiatives in risk-informed regulation that should reference the appropriate current Code requirements.
- The process used over the past 30 years involving updating the ISI & IST Programs every 120 months is well known and is working very well. If the process were changed to delete the update requirement, it would involve many unknowns that cannot be predicted at this time. This uncertainty is unacceptable.

**4. Elimination of the 120-month update is considered contrary to the spirit of the intended implementation of Public Law 104-113 and OMB A119**

- Public Law 104-113, the National Technology Transfer and Advancement Act of 1995 OMB and Circular A-119, "Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities" addresses the use of voluntary consensus technical standards by Federal Agencies. Supplementary Information, item X. "National Technology Transfer and Advancement Act of 1995", indicates the need for the NRC to evaluate the relationship of the public law to the proposal to eliminate the 120 month update and, as a result, determine whether a report (or periodic reports) must be provided to the Office of Management and Budget if the 120-month update requirement is eliminated. We believe that elimination of the 120-month update is contrary to the spirit of the intended implementation of PL 104-113 and OMB A-119. Although the NRC would consider endorsement of later editions of the BPV Code and licensee implementation on a voluntary basis, the current proven process would be replaced by one that introduces many unknowns and uncertainties. The resultant required evaluation and reports referenced in item: X. National Technology Transfer and Advancement Act of 1995

would cause an increased burden on NRC staff that would be avoided by retaining the 120-month update.

- By baselining to the 1989 Code Edition, imposing the 1992 Edition (with 1992 Addenda) for Subsections IWE & IWL, and imposing the 1995 Edition (with 1996 Addenda) of Section XI for Appendix VIII, the NRC is applying only selected parts of different code Editions on licensees. This will create confusion regarding proper overall implementation of the Code, and could have an adverse impact on maintaining proper configuration control.

- Since states routinely update references in their regulations to require the latest editions of ASME codes and standards, the proposed rulemaking would create greater inconsistencies between Federal and state requirements. Such inconsistencies between Federal and state jurisdictions would have a negative impact on Code users.

**Conclusion**

The 120-month update has served as a mechanism for licensees to keep their ISI and IST programs consistent with current improvements in technology reflected in codes and standards, including improvements affecting health and safety and increased efficiencies, and ongoing assessment of the process by NRC. It provides for systematic implementation of safety enhancements with a minimum of bureaucratic involvement. Operational experience has, and will continue to be incorporated in ASME Code revisions to assure appropriate implementation of safety provisions and ALARA considerations. The 120-month update reflects the latest edition and addenda to the ASME Codes endorsed by the NRC. The NRC need only review and approve new editions and addenda and to incorporate them by reference into 10CFR50.55a to have the provisions incorporated by licensees. Improvements in the Code that reduce burden are also implemented at the same time. It will maintain a more current, consistent and uniform standard for the entire industry that will minimize separate submittals and evaluations on a case-by-case basis between utilities and NRC staff. It would facilitate the transition from the deterministic approach to a more risk-informed and performance-based approach that both the NRC and ASME are moving toward as a high priority. Without it, the entire burden of operational continuous improvement and upgrade of programs rests with the licensees, with diminished oversight by the NRC, and only those very large and infrequent enhancements that pass the backfit rule would be mandated in the regulation.

The Nuclear Utility industry is experiencing, and will continue to experience, significant restructuring as deregulation is implemented. Chief Nuclear Officers and management teams will change. Industry events, primarily through aging and technology improvements will drive changes to the code. The code is a reflection of these forces and will be upgraded. As stakeholders in this proposal, the ASME, NRC and Utilities have unique and interdependent roles in the regulatory framework that maintains the pressure boundary integrity and operational readiness of mechanical equipment. This is key to maintaining nuclear safety. The impact of the proposed rulemaking could be to upset the balance of that regulatory framework.