

Official Transcript of Proceedings  
NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards  
575th Meeting: Open Session

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Friday, September 10, 2010

Work Order No.: NRC-409

Pages 1-29

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

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1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION

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4 575TH MEETING

5 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

6 (ACRS)

7 + + + + +

8 FRIDAY

9 SEPTEMBER 10, 2010

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11 ROCKVILLE, MARYLAND

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13 The Committee met at the Nuclear  
14 Regulatory Commission, Two White Flint North, Room  
15 T2B1, 11545 Rockville Pike, at 8:30 a.m., Said Abdel-  
16 Khalik, Chairman, presiding.

17 COMMITTEE MEMBERS:

18 SAID ABDEL-KHALIK, Chairman

19 J. SAM ARMIJO, Vice Chairman

20 JOHN W. STETKAR, Member-at-Large

21 SANJOY BANERJEE, Member

22 DENNIS C. BLEY, Member

23 MARIO V. BONACA, Member

24 MICHAEL L. CORRADINI, Member

25 DANA A. POWERS, Member

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COMMITTEE MEMBERS: (CONT.)

- HAROLD B. RAY, Member
- MICHAEL T. RYAN, Member
- WILLIAM J. SHACK, Member

ACRS STAFF PRESENT:

- DEREK WIDMAYER, Designated Federal Official
- HOSUNG AHN
- JEAN-CLAUDE DEHMEL
- RICHARD RAIONE
- ED ROACH

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C-O-N-T-E-N-T-S

Opening remarks by ACRS Chairman ..... 4

Proposed Interim Staff Guidance

DC/COL-ISG-13, "Assessing the Consequences  
of an Accidental Release of Radioactive  
Materials from Liquid Waste Tanks"  
and Proposed DC/COL-ISG-14, "Assessing  
Groundwater Flow and Transport of Accidental  
Radionuclide Releases." ..... 5

Conclusion of this section ..... 29

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

8:29 a.m.

CHAIRMAN ABDEL-KHALIK: The meeting will now come to order. This is the second day of the 575<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards. During today's meeting, the Committee will consider the following.

1. Proposed Interim Staff Guidance DC/COL-ISG-13, "Assessing the Consequences of an Accidental Release of Radioactive Materials from Liquid Waste Tanks," and Proposed DC/COL-ISG-14, "Assessing Groundwater Flow and Transport of Accidental Radionuclide Releases."

2. Future ACRS Initiatives and Report of the Planning and Procedures Subcommittee.

3. Reconciliation of ACRS Comments and Recommendations.

4. Assessment of the Quality of Selected NRC Research Projects.

5. Preparation of ACRS Reports.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act.

Mr. Derek Widmayer is the designated federal official for the initial portion of the

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1 meeting. We have received no written comments or  
2 requests for time to make oral statements from members  
3 of the public regarding today's sessions.

4 There will be a phone bridge line. To  
5 preclude interruption of the meeting, the phone will  
6 be placed in a listen-in mode during the presentations  
7 and committee discussion.

8 A transcript of portions of the meeting is  
9 being kept and it is requested that the speakers use  
10 one of the microphones, identify themselves and speak  
11 with sufficient clarity and volume so that they can be  
12 readily heard.

13 At this time we will proceed to the first  
14 time on today's agenda, which is Proposed Interim  
15 Staff Guidance ISG-13 and ISG-14 and Dr. Ryan will  
16 lead us through that discussion. Dr. Ryan.

17 MEMBER RYAN: Thank you, Mr. Chairman. As  
18 you mentioned, ISG-13 and 14 are in front of us today  
19 and we are going to have I think some good briefings  
20 from the staff.

21 Let me make a comment and say this is a  
22 distinct matter from the groundwater initiative  
23 program that is going on, looking at long-term, small  
24 quantity leakage issues that have occurred at various  
25 power plants.

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1           This is really an update to some interim  
2 staff guidance as we will learn, I believe, on new  
3 licensing efforts to assess some kinds of accidents at  
4 new plants.

5           So, we are going to hear about the  
6 groundwater issues I think later in some separate  
7 briefings perhaps later in the year, but for the  
8 moment we are going to be hearing about ISG-13 and 14  
9 and with that, I guess I'll turn it over to Dr.  
10 Dehmel. Welcome and thank you for coming.

11           MR. DEHMEL: Thank you. Again, my name is  
12 Jean-Claude Dehmel and I am with the NRO DCIP, the  
13 health physics group. I am going to over ISG-13. We  
14 gave you a couple of briefings before.

15           This is naturally a continuation of our  
16 effort in revising the guidance. We have submitted a  
17 proposed revision to the guidance namely SRP section  
18 11.2, BTP 11-6 as well as the supporting aspects on  
19 groundwater modeling that is continuing in the SRP  
20 section 2.13.

21           And this is the result, this presentation  
22 represents in essence the initial distillation of NEI  
23 comments we have obtained from the Federal Register  
24 Notice.

25           So on ISG-13, we, NEI submitted 40

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1 comments, 28 of which were substantive comments, 12  
2 were editorial, and as you can imagine, because there  
3 was a parallel Federal Register Notice on ISG-14,  
4 there were eight correlating comments on ISG-14 that  
5 we are going to have to tackle and address in ISG-13.

6 Basically what we have done for the  
7 purpose of this presentation, broken down the  
8 substantive comments into both categories involving  
9 source term development, applicability of the tech  
10 specs, tank inventories, the kind of and the level of  
11 conservatism that may be applied for this analysis,  
12 the options in applying different types of mitigative  
13 design features, acceptance criteria, meaning once you  
14 do an assessment, when do you know that the results  
15 were acceptable or not, receptor location and  
16 applicability of the revised guidance and the  
17 implementation in the light of new reactor licensing.

18 So I am going to take these things one by  
19 one and go briefly over them. Source term development:  
20 there was an issue as to whether or not the listing of  
21 radionuclide we had added in Appendix A or Attachment  
22 A to ISG-13 was comprehensive or mostly -- well, in  
23 this particular case, the concern was 23 radionuclides  
24 that were cited and they are namely Tc-99 and I-129,  
25 the concern was those radionuclides are typically not

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1 considered in developing the source terms for the  
2 purpose of Chapter 11.1 of the FSAR as well as Chapter  
3 12, because they don't offer much contribution to  
4 those which we spare occupational radiation exposure  
5 as well as outside releases.

6 So the thought that we would include those  
7 -- the process that we are thinking about is retaining  
8 those radionuclides and essentially putting the onus  
9 on the applicant to confirm to us whether or not those  
10 radionuclides are there or not there, and then make a  
11 case if they are excluded for whatever reason and we  
12 will look at that justification and make a  
13 determination whether or not that reasoning is  
14 applicable and justifiable.

15 So that listing on the back of the ISG-13  
16 attachment, what do you mean? Applicability of  
17 administered tech specs to inside and outside tanks.  
18 Here what we are trying to do is also reconsolidate  
19 discrepancy or an inconsistency between SRP Section  
20 11.2, BTP 11.6 and the initial guidance on that which  
21 is contained in NUREG-0133.

22 The thought was that the tech spec  
23 requirement would require only on outdoor tanks but  
24 the way it is described in NUREG-0133 is that one does  
25 the analysis for both inside and outside tanks and

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1 then even for the inside tanks you determine that you  
2 may or may not meet the acceptance criteria, and we  
3 are going to go over that later on, then therefore an  
4 inside tank should also be considered in the analysis.

5 So the industry's thought was that the  
6 tech spec only applies to outdoor tanks and tanks that  
7 are out there for more than three months, so we are  
8 going to change the guidance to make sure that it's  
9 clear that this applies to any tanks, regardless of  
10 the duration of the -- for temporary tanks that is --  
11 duration of the temporary storage or use of a tank  
12 outside.

13 MEMBER CORRADINI: So just so I understand,  
14 the key is a temporary tank regardless of where it is?

15 MR. DEHMEL: Regardless of where it is.

16 MEMBER CORRADINI: Okay.

17 MR. DEHMEL: Yes. All right.

18 MEMBER CORRADINI: That's what I was --

19 MR. DEHMEL: So we are going to -- what we  
20 are going to do is import and modify the information  
21 out of NUREG-0133, put that in the ISG-13, in essence  
22 make it clear that the previous guidance that is cited  
23 in NUREG-0133 is now superseded by this new  
24 information.

25 Required level of conservatism: so there

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1 was -- we are probably at fault, the staff is probably  
2 at fault on this one because we tried to provide more  
3 information, but apparently our effort in trying to  
4 clarify was just not enough.

5 So we are going to work on that obviously  
6 and we are also going to have work on that because  
7 there is obviously a correlating effect with Section  
8 204.13 and ISG-14 so we are going to have to spend  
9 some time working with the two branches in trying to  
10 figure out that the level of conservatism, both in the  
11 context of developing the source term and the  
12 assumptions for the analysis, as well as the  
13 corresponding assumptions that are made in a movement  
14 of the radioactivity of the groundwater and a  
15 definition of the receptor location and so on are all  
16 consistent in terms of the level of conservatism.

17 So the focus will be redefining and  
18 probably more guidance and obviously presenting an  
19 approach that relies on a screening model so to speak,  
20 or a simpler model to a more sophisticated model  
21 depending on the outcome of each analysis.

22 So if you were to use a very simple  
23 screening model and it failed, and the question, well  
24 maybe you should reconsider the assumptions that were  
25 made that were perhaps overly conservative and then

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1 you would go and ratchet essentially the analysis to  
2 the point where in the end, you may have to use a very  
3 sophisticated model.

4 So this offers two options. One is it  
5 simplifies the analysis. You could use a simple  
6 screening model and the results show that you are in  
7 compliance with the acceptance criteria and be done  
8 with it.

9 MEMBER RYAN: It seems to me, Jean-Claude,  
10 that allows for a range of approaches based on the  
11 specifics for a given plant versus another. Some might  
12 be very simple and straightforward and others might  
13 need to go to the more complicated model. Is that a  
14 fair view?

15 MR. DEHMEL: Right. Right. Receptor  
16 location. Again, we are trying to clarify that and  
17 apparently we were just not clear enough, so we are  
18 going to expand that with respect to what is meant by  
19 the receptor location or the point of views.

20 So the thought was initially we are going  
21 to -- we are thinking about the point of use meaning  
22 the point of use of where you would draw the water for  
23 consumption, either for drinking water or you draw the  
24 water from the watering livestock or your gating  
25 pastures or crops.

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1           And so now we are going to change it to  
2 where the material first enters surface water body or  
3 groundwater, outside of the site boundary so to speak.

4           Acceptance criteria: again there, we tried  
5 to clarify what we meant or what was meant by the  
6 initial guidance and so as you may recall, the initial  
7 focus was in compliance with the effluent  
8 concentration limits that were planning to be Part 20  
9 Table 2.

10           And the bottom line with that was it posed  
11 the problem because the assumption was the end use is  
12 always drinking water, so if this was the case, the  
13 application of ECLs was straightforward and simple.

14           But buried in the prior guidance was that  
15 when -- that in addition to drinking water, there was  
16 a consideration with respect to the indirect use of  
17 water, meaning watering livestock and using the water  
18 for irrigation.

19           So the ECL concentration as an acceptance  
20 criteria just don't lend themselves very well to that  
21 and the thought was we would have essentially a dual-  
22 step system where, if you had simply drinking water  
23 complying with the ECL was fine and you were done with  
24 it, and then if you had no drinking water, then you  
25 would have to go to dose calculations, something a

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1 little bit more complicated with respect to having to  
2 figure out how is the water used, what are the  
3 reconcentration issues that are radionuclides and  
4 whether or not you are dealing with crops or pastures  
5 and so on.

6 So then we thought, well, for that pathway  
7 we would apply 100 millirem. Then we had an  
8 inconsistency because ECLs are based on 50 millirem  
9 per year and in those calculations for this indirect  
10 use would be based on 100 millirems, so again another  
11 discrepancy, another inconsistency.

12 So now we are going to streamline  
13 everything to 100 millirem, period. And that makes  
14 that criteria essentially parallel with the one that  
15 is used for a similar accident for the old gas system,  
16 meaning the failure of a gas system delay tank or  
17 charcoal delay bed.

18 So there is a limit to 100 millirem there  
19 for systems that are not seismically qualified or  
20 systems that are not designed to withstand internal  
21 explosive gas mixtures.

22 So at least for the common accidents of  
23 failure analysis, for liquid effluences or gaseous  
24 effluence, there will be a common acceptance criteria  
25 of 100 millirem, so we are going to normalize that.

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1 Mitigative design features: again there  
2 was some confusion there with respect to what the  
3 guidance say and also looking back with respect to  
4 what has been acceptable in the past and by the way I  
5 don't know why there's a different highlight here.  
6 There is no importance here.

7 The thought was that we would essentially  
8 not allow the use of coatings, even those that would  
9 meet the specific reg guide's compliance with the  
10 coatings because it's not passive and it's not durable  
11 -- it's passive but it's not durable, let's put it  
12 this way.

13 And the thought was that we would  
14 essentially focus on liners because liners was an  
15 excellent way of containing the entire content of a  
16 tank that might have ruptured within a cubicle or  
17 within a room.

18 But then we looked further in the guidance  
19 in the reg guide 1.143 addressing acceptable design  
20 features for rad waste building and cubicles  
21 containing rad waste processing equipment is that  
22 basically it had enough of a concrete structure with  
23 sumps and walls that were designed to contain liquid,  
24 that that would be acceptable.

25 So we the staff had posed requirements in

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1 essence that were above and beyond the reg guide  
2 addressing these kinds of design features for the  
3 purpose of assessing the consequence of a postulated  
4 failure of a rad waste tank.

5 So what we are going to do with that one  
6 is we are going to step back and point to reg item  
7 1.143 which describes its acceptability as far as  
8 design features, point to reg item 4-21, Appendix A1,  
9 which describes similar type of engineering design  
10 features and in greater length than reg guide 1.143  
11 does and leave it to the applicant to actually figure  
12 out what kind of design features fit best for that  
13 particular design, for the rad waste system for the  
14 building where the equipment is located, and use that  
15 approach.

16 As far as I can tell, the introduction of  
17 liners started with the ABWR design certification  
18 where GE committed to installing steel liners in the  
19 rad waste building where their liquid waste management  
20 system components were located and that GE then went  
21 ahead and followed through with the ESBWR design.

22 And we followed through as well, because  
23 we thought it was a good feature and it is a good  
24 feature. But it should be, at this point, the thought  
25 was, is it should be an option that the applicant

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1 should make a determination whether or not it's a  
2 preferred design feature. We are not going to  
3 discourage it. Obviously we are going to highlight it  
4 as one acceptable feature. We will cite the two  
5 precedents, namely the ABWR DCD and the ESBWR DCD as a  
6 case example where the staff has found that kind of a  
7 design feature acceptable.

8 But we are not going to make it a  
9 prerequisite because it is contrary to the regulatory  
10 commission in both of these reg guides, 1.143 and 4-  
11 21.

12 MEMBER BLEY: And I take it after  
13 consideration you felt there wasn't a strong enough  
14 case to revise the reg guide or is just too much work?

15 MEMBER RYAN: Jean-Claude, I recall the EPR  
16 had some compartmentalization about areas with tanks  
17 with the idea of controlling overflow. I am not sure  
18 if I am remembering that right, but --

19 MR. DEHMEL: Yes. Yes. The same right. But  
20 they are -- essentially you see the EPR is stepping  
21 away from liner, the ABWR is stepping away from steel  
22 liners. They have both considered it and then they  
23 stepped back.

24 MEMBER RYAN: Yes. Okay.

25 MR. DEHMEL: So, what we proposed to do

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1 with ISG-13? So basically, we are going to address and  
2 resolve the NEI comments identified earlier and we are  
3 going to have a meeting at the end of the month with  
4 NEI. We are going to go over this -- essentially the  
5 same presentation with NEI.

6 We are going to restructure the ISG-13 for  
7 further clarification, including interface with ISG-  
8 14. We are going to keep the system design's  
9 engineering valuation ISG-13 because that makes sense.  
10 It's tied to chapter 11.2, where the analysis of and  
11 evaluation of the designs are.

12 We are going to clarify the guidance on  
13 the application of mitigative design feature. Again,  
14 what I just discussed was steel liner and making  
15 emphasis on reg guide 1.143 and 4-21.

16 We are going to relocate the source term  
17 modeling guidance on NUREG-0133 to ISG-13. Right now  
18 it's kind of split and so we are essentially supersede  
19 that section of NUREG-0133 and bring it forward.

20 We are going to also relegate the use of a  
21 code in NUREG-0133, it's called RATAFR, which was used  
22 for that kind of purpose and present in ISG-13 and  
23 11.2, in SRP 11.2 and BTP 11-6, a conceptual approach  
24 which kind of mimics what the computer code did and  
25 leave it up to the applicant to use a code methodology

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1 similar to what was cited in NUREG-0133 or use  
2 something better.

3 The problem with the code is it's outdated  
4 and secondly, it does the calculation but built into  
5 the code are all the old effluent concentration limits  
6 of the old Part 20 which doesn't work anymore  
7 obviously. So that's one issue.

8 And then we are going to expand the  
9 guidance on source term bases and development. We are  
10 going to clarify the guidance on grading a screening  
11 approach in assessing the impacts. We are going to  
12 redefine the acceptance criteria, 100 millirem for  
13 direct, indirect exposure pathways at the point of  
14 entry, in ground or surface water body.

15 We are going to relocate the dose  
16 assessment and verification of compliance with ISG-14.  
17 Yes, I need to expand on this a little bit. What we  
18 are going to do now is that ISG-13 and BTP 11-6 will  
19 present the methodology for the source term  
20 development, the assessment of the engineering  
21 capability of the systems and the room where the  
22 equipment is located, and then the folks in RHEV will  
23 take that source term, plug it into the groundwater  
24 model, and come up with concentration at a point of  
25 use, which is either a surface water body or

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1 groundwater body.

2 MEMBER RYAN: That sounds kind of a sharp  
3 line if you are generating a source term and ISG-14  
4 will take it into transport and --

5 MR. DEHMEL: Correct.

6 MEMBER RYAN: model.

7 MR. DEHMEL: And then from that we will  
8 then take it back, because then we get concentration  
9 in the water, right. And we will essentially then  
10 crank out the dose calculation and confirm whether or  
11 not it meets the acceptance criteria of a dose under  
12 100 millirem. So that's the way it's going to be done.

13 MEMBER RYAN: Okay.

14 MR. DEHMEL: And then we are going to  
15 relocate the administered tech specs requirement on  
16 some inventories from NUREG-0133 to ISG-13, so again,  
17 that's going to be somewhat different, because all of  
18 that text that is now in NUREG-0133 is going to be  
19 imported, slip into ISG-13 and elaborated upon.

20 And also we are going to requalify the  
21 administered tech specs as being one of the elements  
22 in operational program because every time we said tech  
23 specs, the industry kind of, is somewhat worried  
24 because they think about tech specs in a traditional  
25 content where every time you change your tech specs,

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1 you have got to file for a license amendment.

2 This is purely in the context of the  
3 administrative programs that are described in a tech  
4 spec in Chapter 16 in Section 5. But having to do  
5 where those elements of the tech specs are into the  
6 offsite dose calculation manual, which is not required  
7 to be submitted every time you make a change to the  
8 offsite dose calculation manual, the same way you did  
9 a traditional tech spec.

10 So that required classification, because  
11 every time we say tech specs, the industry panics.

12 And then we are going to realign the staff  
13 review responsible as an interface among SRP 2-413-11-  
14 2 BTP 11.6. What I just described with respect to the  
15 relationship of the source term development being  
16 defined in 11-2. We turn it over to RHEV. They do  
17 their thing. Then we retrieve the information from  
18 that, the code output, and then we do only the dose  
19 calculation confirmation back in Chapter 11.2.

20 Are we taking questions no, or we can do  
21 it later?

22 MEMBER RYAN: Any questions?

23 DR. AHN: Good morning. My name is Hosung  
24 Ahn. I am in the hydrogeologic engineering branch of  
25 NRO and I was involved in revising other -- developing

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1 this ISG-014.

2 Basically, ISG-014 is supplemental  
3 guidance for existing SRP section 2, 4, 12 and 13.  
4 That addressed the radiological consequence of a  
5 release in groundwater as well as surface water.

6 If that included how we develop the  
7 conceptual site model and how we characterized onsite  
8 hydrogeology, then how we analyzed the transport  
9 analysis in groundwater as well as surface water.

10 So once we published this ISG-014, NEI  
11 provided a consolidated industry comment to us and we  
12 reviewed that and other than the interfacing issue  
13 between ISG-013 and 014, I think their comment is  
14 quite favorable and especially with mention on ISG-014  
15 that if they need mitigation measure in future, then  
16 we said the applicant may waive consequence analysis  
17 but still they need to characterize onsite  
18 hydrogeology.

19 Then they said, well, that -- giving the  
20 credit for mitigation measure in future will be  
21 favorable to the industry. That's what they commented.  
22 And the other comment is that this ISG provides  
23 specific guidance on how we establish onsite  
24 hydrogeology and how we do the onsite hydrogeologic  
25 measurement. We provided some of them and they said

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1 that's very good. So that's the general comment on  
2 there.

3 And I will explain the specific over there  
4 comment by section by section of ISG-014. We got  
5 totally over 41 comments and reviewed that and we  
6 decided that 24 comments are relevant to revise either  
7 just the small text changes or the changes on ISG-014  
8 so we are going to revise that.

9 Then remaining 13 comments, that's more  
10 like a clarification issue. So on our response to NEI  
11 comment, we will address that but we will not use that  
12 on --

13 BBB. Can you clarify that NEI comment  
14 about this mitigation measures, credit --

15 DR. AHN: I will explain that --

16 BBB. Okay. You are going to?

17 DR. AHN: Yes. I am going to. Yes. So I  
18 will explain their major concerns on section by  
19 section on ISG-014. The first on the background  
20 section over the ISG-014, we describe what's the  
21 background of the baseline on the NRC system.

22 We proposed that when we analyze  
23 radionuclidic transport in groundwater or surface  
24 water, what kind of base hydrogeologic condition  
25 applicants should use? Most of the case, they

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1 estimated conservative assumption record, very low  
2 stream flow or high gradient of groundwater and they  
3 estimate the transport analysis and consequence  
4 analysis.

5 But our regulations said we should rely on  
6 the average annual hydrogeologic condition and that's  
7 consistent with RG 1.113. So we clarified that issue  
8 on there.

9 Then the NEI asked what is the regulatory  
10 basis on that? Again, we said that the regulatory  
11 basis is Part 20, Appendix B as far as guidance in RG  
12 1.113.

13 So we will clarify that in our ISGs.  
14 That's the background issue. And on onsite  
15 hydrogeologic characterization section, they made two  
16 comments. First one is does ISG-014 introduce a new  
17 requirement for annual average dose limit? Second  
18 question is items E of this section appear to  
19 introduce a new criteria for hydrogeologic condition  
20 as well as onsite testing.

21 Our answer is no, we don't introduce a new  
22 regulation or guidance, but we just clarify on that  
23 issue. That's our response to the NEI comment.

24 MEMBER RYAN: And you are not requiring any  
25 in situ testing?

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1 DR. AHN: That was already on Part 120 but  
2 we clarified that issue.

3 MEMBER RYAN: Okay. It's not something  
4 separate in this --

5 DR. AHN: No, it's not. Then, I will  
6 explain a receptor point issue. We described how we  
7 select the receptor point, actually what are the  
8 definition of receptor point and how we select the  
9 receptor point. Sometimes some site, that's a little  
10 bit issue.

11 So we tried to clarify that and the NEI  
12 said need more clear definition of a receptor point  
13 and how we applied that. So we are going to revise our  
14 text to clarify that issue.

15 Then how we analyze direct release to  
16 groundwater section and how we developed the  
17 conceptual site model or numerical model. On that, we  
18 have four major comments. First, clarify main  
19 objection of groundwater modeling. That's what NEI  
20 asked. And we addressed that issue on ISG but we will  
21 reinforce that so that may be more clear on the  
22 background and actual guidance of the attachment.

23 And next one is when a high consequence  
24 analysis is used, we addressed that issue already on  
25 ISG-014 but we are going to clarify that more clearly

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1 so that they can understand the reality of the  
2 situation in support of higher authority.

3 Then, next one is the -- on our ISG-014,  
4 we mentioned that when they do the radiological  
5 consequence analysis, especially for tritium, EPA  
6 drinking water standard is more conservative so when  
7 we do the environmental intake analysis we also used  
8 that criteria, but on safety accidental use analysis,  
9 we put that across on proposed ISG but NEI said it  
10 should not be there and we also discussed this issue  
11 with or OGC and they said it's not appropriate to  
12 include this. So our revision will remove that  
13 specific item.

14 MEMBER RYAN: So you are reverting back to what  
15 comparison and you're back to the dose standards that  
16 are in --

17 DR. AHN: Yes.

18 MR. DEHMEL: Yes, the 100 millirem, that's  
19 what we are going to apply there, yes.

20 DR. AHN: Maybe it is a little bit  
21 consistent too with your position.

22 MEMBER RYAN: In my own view, that's an  
23 appropriate change because the EPA drinking water  
24 standard basis is a completely different structure.

25 MEMBER BLEY: This is not drinking water.

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1 DR. AHN: They also asked that provide a  
2 regulatory basis of waiving the consequence analysis  
3 and Jean-Claude already addressed that issue. And  
4 finally, applicability. They commented and we will  
5 revise that. So that's pretty much --

6 MEMBER SHACK: Wait, you are going to  
7 accept that? On the applicability?

8 DR. AHN: Yes.

9 MEMBER SHACK: I mean, since there's no new  
10 requirements here, you are only clarifying what the  
11 actual requirements are, why isn't that applicable to  
12 any application that hasn't been already finalized and  
13 accepted?

14 MR. DEHMEL: That's a licensing issue, I  
15 guess.

16 MR. ROACH: This is Ed Roach with New  
17 Reactors Office, Health Physics. When ISGs are  
18 published, they restate and the applicant can use  
19 those for clarification on their application. What  
20 these incorporate are the lessons learned from the  
21 applications we have reviewed so far. We haven't  
22 stated that regulations or guidance does not apply. We  
23 were trying to clarify that.

24 So I think Dr. Ahn's point and our point  
25 is that when we publish the ISG final, those

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1 applications that are already in the door don't have  
2 to go back and redo everything in accordance with  
3 these ISGs. We have already applied the appropriate --

4 MEMBER SHACK: Okay, you have reviewed them  
5 essentially to this kind of standard.

6 MR. ROACH: Yes, and what we have  
7 identified, and I guess that would be the point I  
8 would make, is that through the course of the first  
9 series of DCs and applications we have received, these  
10 are essentially lessons learned where we had guidance  
11 that was probably confusing, unclear, and we resolved  
12 them through your RAIs or -- inconsistent.

13 And so the purpose here is to get this out  
14 and then get it reincorporated into a revision to the  
15 SRP. Does that answer your question sir?

16 MEMBER SHACK: Yes.

17 MR. ROACH: Okay. Thank you.

18 MEMBER RYAN: Thank you Dr. Ahn. Any  
19 questions? Going once, going twice. My own view is I  
20 think these clarifications are excellent  
21 clarifications that are built upon the input that you  
22 have got from industry in our previous meeting. At  
23 some point we will be ready to hopefully write a  
24 letter and recommend implementation as amended.

25 I am wondering now, it seems to be there

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1 is going to be a number of significant changes to the  
2 actual documents from this point moving forward.

3 MR. DEHMEL: Correct.

4 MEMBER RYAN: So I am guessing, Mr.  
5 Chairman, that we are probably not in a position to  
6 say issue the guidance because they haven't really  
7 finalized it yet.

8 But I think that, based on what we have  
9 heard today and all those things being equal, I think  
10 it might be appropriate for us to just take this up  
11 with a question that they are going to get implemented  
12 as described today, so that is where we can probably  
13 issue the letter concurring with implementing these  
14 revised guides. So do you have any idea on schedule,  
15 Ed or when that might be, or --?

16 MR. ROACH: We were discussing that this  
17 past week and looking at the items on our plate, this  
18 first quarter of FY11 will be a challenge for us  
19 because of our support for the rulemaking for Part 20  
20 and 50, Appendix I.

21 So we anticipate probably the first  
22 quarter of the New Year, actual calendar 2011, getting  
23 it out.

24 MEMBER RYAN: Well, and of course, I would  
25 hate to say everything would be just like you

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1 described it today, because who knows what might come  
2 up in the intervening time.

3 So I think the subcommittee recommendation  
4 would be to table this and hold just a final check as  
5 opposed to a detailed review, to make sure that what  
6 you have described today is how things work out and  
7 then we would say, based on those things being  
8 accomplished, that we would recommend to the full  
9 committee that they write a letter advising them,  
10 implementing the guidance.

11 CHAIRMAN ABDEL-KHALIK: Okay.

12 MEMBER RYAN: Does that sound like a plan  
13 forward?

14 CHAIRMAN ABDEL-KHALIK: That's fine. Okay.  
15 Thank you.

16 MEMBER RYAN: So with that, Mr. Chairman, I  
17 will turn it back to you. Thank you.

18 CHAIRMAN ABDEL-KHALIK: Thank you. We are  
19 well ahead of schedule, but at this time, we will go  
20 off the record.

21 (Whereupon the above-entitled matter went off the  
22 record at 9:04 a.m.)

23  
24  
25  
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UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

*Presentation to the 575<sup>th</sup> ACRS Meeting*

**ISG-013**

**“Assessing the Consequences of an Accidental Release  
of  
Radiological Materials from Liquid Waste Tanks”**

*September 10, 2010*

Jean-Claude Dehmel

Edward Roach, BC

(NRO/DCIP/CHPB)



## Overview of NEI Comments

- NEI presented 40 comments on ISG-013:
  - 28 substantive comments
  - 12 editorial comments
  - 8 correlated comments cited in ISG-014
- For substantive comments, the issues address:
  - Source term development
  - Applicability of TS limits on tank inventories
  - Applied level of conservatism
  - Mitigative design features
  - Acceptance criteria
  - Receptor location
  - Applicability and implementation

## Response to NEI Comments

### Source Term Development

**Issue:** Addressing radionuclides not in ANSI/ANS 18.1 but could be important based on half-life and transport characteristics

**Action:** Include H-3, C-14, Tc-99, and I-129 in the ISG-013 because of half-lives and increased environmental mobility. The ISG will request applicants to present technical justification for omitting radionuclide listed in ISG-013.

### Application of Administrative TS to Inside and Outside Tanks

**Issue:** ISG-013 considers inside and outside tanks as having possible TS limits. The inclusion of inside tanks is inconsistent with standard technical specification documents.

**Action:** NUREG-0133 specifies that inside tanks can have TS limits based on the consequence analysis. Staff will address inconsistency between NURG-0133 and Standard TS and develop a revised position in ISG-013.

## Response to NEI Comments

### Required Level of Conservatism

**Issue:** Confusion on level of conservatism required for the consequence analysis. This confusion stems from seemingly different approaches described in ISG-013 and ISG-014, and acceptance criteria based on Part 20 ECLs and dose limits.

**Action:** Staff prefers a screening approach to the consequence analysis. The ISG will clarify that the applicant should first use a simple worst-case screening analysis. If this worst-case analysis demonstrates acceptability, then no further action is required. If the worst-case cannot demonstrate acceptability, then applicant needs to provide a more refined analysis and justification the approach.

### Receptor Location

**Issue:** Stakeholders not clear as to where they should calculate consequences and apply acceptance criteria.

**Action:** Further clarification needed. Staff prefers location outside the site boundary, where materials first enter a surface water body used for drinking or indirect uses. For ground water, staff prefers selecting a location where releases impact drinking water outside the site boundary.

## Response to NEI Comments

### Acceptance Criteria

- Issue:** Several comments noted on acceptance criteria. One issue pertains to the inconsistent use of the Part 20 ECLs for direct water use (based on 50 mrem/yr) and annual dose limit of 100 mrem/yr for indirect pathways. Another issue pertains to the fact that the acceptance criteria should refer to the dose associated with a tank failure event. This needs clarification recognizing that releases to surface water produce dose rather quickly, while releases to groundwater produce protracted exposures and doses. Another issue pertains to the need to combine the consequences from direct drinking water use with indirect water use.
- Action:** Acceptance criteria require clarification and include appropriate acceptance criteria for different situations. Staff is mindful not to create a complicated set of acceptance criteria.

## Response to NEI Comments

### Mitigative Design Features

- Issue:** If allowed to take credit for mitigative design features, how should applicants address the requirements in ISG-014 that pertain to the adequacy of site hydro-geologic properties?
- Action:** Further clarification needed as ISG-013 and -014 address different aspects. While both ISGs address protection against unintended releases, ISG-013 addresses the adequacy of the LWMS design and ISG-014 addresses inherently protective site features.

### Applicability

- Issue:** Stakeholders unsure as to when ISG-013 takes effect and if current applications need to incorporate the new guidance.
- Action:** Staff to clarify issue. Presently, the staff will not apply ISG-013 to current applications. Staff will apply new ISGs to any application received 6 months after the issuance of both final ISGs, with ISGs subsequently incorporated in the SRP.

## Staff Proposed Action 1/2

In revising and reissuing ISG-013 (SRP 11.2 and BTP 11-6), staff will:

- Address and resolve NEI comments identified earlier
- Restructure ISG-013 for further clarification and interface with ISG-014
- Keep systems design engineering evaluation in ISG-013
- Clarify guidance on the application of mitigative design features
- Relocate source term modeling guidance from NUREG-0133 to ISG-013
- Expand guidance on source term basis and development in ISG-013

## Staff Proposed Action 2/2

In revising and reissuing ISG-013 (SRP 11.2 and BTP 11-6), staff will:

- Clarify guidance on a graded /screening approach in assessing impacts
- Redefine acceptance criteria as 100 mrem for direct and indirect exposure pathways at the point of entry in a ground aquifer or surface water body
- Relocate dose assessment and verification of compliance in ISG-014
- Relocate administrative TS requirement on tank inventories from NUREG-0133 to ISG-013
- Expand guidance on administrative TS as one element in operational programs
- Realign staff review responsibilities and interfaces among SRP Sections 2.4.13 and 11.2, and BTP 11-6



## Staff Proposed Action

Any questions?





# U.S. NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

*Presentation to the 575th ACRS Meeting*

## **ISG-014: “Assessing Groundwater Flow and Transport of Accidental Radiological Releases”**

*September 10, 2010*

Hosung Ahn (NRO/DSER/RHEB)

# Response to NEI Comments

## Summary of Revision

- 24 comments were used to revise the ISG-014 text, while 17 comments were addressed in the response without any text changes.

## Background Section:

- Clarify the regulatory basis of proposing ‘annual average hydrologic occurrence.’ (Comments #10 & 21).

## On-site Hydrogeologic Characterization Section:

- Does ISG-014 introduce a new requirement for annual average dose limits? (#22).
- Item (e) of this section appears to introduce new criteria for areal hydrological conditions and requirement for in-situ testing (#23).

# Response to NEI Comments

## Receptor Location Section:

- Clarify the description of receptor points (#27).

## Direct Release to Groundwater Section:

- Clarify the main objective of groundwater modeling (#6).
- Clarify when a hierarchical consequence analysis is used (#7 & 11).
- Remove the requirement of meeting the EPA drinking water standard for FSAR 2.4.13 consequence analysis (#35).
- Provide the regulatory basis of waiving FSAR 2.4.13 consequence analysis (#36).

## Applicability:

- Applicability should be for initial applications received after final ISG is approved (#1).