

Criscione, Lawrence

From: Criscione, Lawrence
Sent: Thursday, September 20, 2012 12:27 PM
To: Sarley, Chris
Subject: RE: Request Assistance

Chris,

Peter Spencer of the Energy and Commerce Committee has been in contact with me regarding my concerns. I haven't heard from Peter since the weekend. When I was last in contact with Peter, I was unaware of the NRC's claims that DHS and FERC were the source of the redactions. I did not become aware of these claims until this morning. As such, I did not make the two specific requests in the email below to Peter or anyone else other than to Congressman Shimkus.

If you believe it more appropriate for the Energy and Commerce Committee staff to handle this request, then that is likely the best place for it.

Is Peter Spencer my point of contact? Will he be getting back to me or to you? Will someone be letting me know if they decide not to act on my request? Will someone be letting me know the response of FERC and DHS?

I really need the assistance of someone on a congressional staff because this issue has devolved into a circle of different federal agencies claiming another agency required the redactions.

Thanks,
Larry

From: Sarley, Chris [mailto:Chris.Sarley@mail.house.gov]
Sent: Thursday, September 20, 2012 11:15 AM
To: Criscione, Lawrence
Cc: 'Lester_Munson@kirk.senate.gov'; 'Sarah_Walter@kirk.senate.gov'; 'Michael_Rasmussen@kirk.senate.gov'; 'Randy_Pollard@kirk.senate.gov'; 'Anne_Wall@durbin.senate.gov'; 'Bill_Houlihan@durbin.senate.gov'
Subject: RE: Request Assistance

Mr. Criscione – We have referred this information to Energy and Commerce Committee staff and it is my understand they have been in contact and are pursuing it.

From: Criscione, Lawrence [mailto:Lawrence.Criscione@nrc.gov]
Sent: Thursday, September 20, 2012 11:57 AM
To: Sarley, Chris; Cianahan, Chase
Subject: Request Assistance

I attempted to send the email below to Congressman Shimkus about an hour ago, but it bounced. I'd prefer to go through his staff anyway, I just couldn't find a staff directory on his webpage.

Please contact me regarding the request below.

Thank you,
Larry Criscione

(b)(6)

From: Criscione, Lawrence
Sent: Thursday, September 20, 2012 10:00 AM
To: 'John.Shimkus@house.mail.gov'
Cc: 'Lester_Munson@kirk.senate.gov'; 'Sarah_Walter@kirk.senate.gov'; 'Michael_Rasmussen@kirk.senate.gov';

'Randy_Pollard@kirk.senate.gov'; 'Anne_Wall@durbin.senate.gov'; 'Bill_Houlihan@durbin.senate.gov'

Subject: Request Assistance

Congressman Shimkus,

I am a federal employee of the US Nuclear Regulatory Commission and a resident of your district from Springfield, IL. The concerns I have are related to the US NRC and I am attempting to address those concerns with staff members of the appropriate congressional committees. I am writing to you not as a federal employee but as one of your constituents seeking assistance.

The attached letter concerns the vulnerability of the three reactors at the Oconee Nuclear Station to a failure of Jocassee Dam. Although ONS is in South Carolina, Illinois has more commercial reactor plants than any other state and the public reaction to a nuclear accident in South Carolina would be devastating to our Illinois reactor plants.

Earlier this year the Office of Nuclear Regulatory Research (RES) of the US NRC released a study of flooding hazards at US reactor plants due to the failure of upstream dams. Significant portions of this report are being withheld from the public under the guise of being "Security-Related Information". In the attached letter, I make the claim that:

Prior to its release the screening report for GI 204 was reviewed by the Department of Homeland Security which found that none of the information related to Jocassee Dam and Oconee Nuclear Station was security sensitive.

I based this claim after the email trail below which was shared with me last February. The email contains the notes taken by Ben Beasley during a telephone call of NRC employees and Duke Energy employees concerning the public release of the screening analysis for Generic Issue 204, "Flooding of Nuclear Power Plant Sites Following Upstream Dam Failure". In those notes it is stated:

George Wilson responded that the review of the Analysis by the Department of Homeland Security did not reflect those concerns. DHS did not identify anything in the Oconee section of the Analysis as being sensitive.

At the time of the 2012-02-08 meeting, George Wilson was the NRC's Dam Safety Officer. Currently that role belongs to Ken Karwoski: phone – 301-415-2752, email – Kenneth.Karwoski@nrc.gov.

George Wilson does not have the analysis done by DHS. The contact at the Department of Homeland Security is Craig Conklin. Supposedly his office at DHS handles both the dam sector and the nuclear sector. I do not have a phone number, but his email address is craig.conklin@dhs.gov.

I have been told that some of the material redacted from the GI 204 Screening Analysis was at the request of the Federal Energy Regulatory Commission (FERC). I do not have a contact name at FERC, but attached is a page from the FERC phone directory which should contain a contact number. From that directory, potential contacts are William Allerton (Washington headquarters) or Wayne King (Atlanta region).

My concern is that the screening report on flooding at nuclear plants due to upstream dam failures is being inappropriately withheld from the public by the US NRC. The NRC is claiming that the redactions are mandated by DHS and FERC. I believe that many of the redactions have nothing to do with security but are rather due to the NRC's tendency to withhold awkward information.

Attached to this email is the unredacted version of the screening report for GI 204. I respectfully request the following assistance from your office:

1. Please forward the GI 204 screening report (ML1107404821) to the Department of Homeland Security and request DHS's assessment as to whether there is any information in section 2.2 (pp. 5-9) which needs to be withheld from the public.

2. Please forward the GI 204 screening report to the Federal Energy Regulatory Commission and request FERC's assessment as to whether there is any information in section 2.2 (pp. 5-9) which needs to be withheld from the public.

I live in Springfield, IL but I work in the Washington metro area (Rockville, MD). I am working in Lisle, IL today. Tomorrow I am taking a day off and will be in Springfield, IL. Next week I will be working in Idaho. I will next be in Maryland on October 1st. I would at some point like to meet with a member of your Springfield or Washington staff.

I have copied on this email members of the staffs for Senators Durbin and Kirk to make them aware of my request. I do not think it appropriate to make the same request to three members of Congress, so at this point I am only requesting that your office assist me with the above two requests. However, I would like to speak with someone from Senator Durbin's and Senator Kirk's staffs (either from Washington or Springfield) to explain my concerns.

If your office is unable or unwilling to assist me with my request, please let me know so I can seek assistance elsewhere.

Thank you,

Larry Criscione

(b)(6)

From: Beasley, Benjamin
Sent: Wednesday, February 08, 2012 12:07 PM
To: Correia, Richard; Peters, Sean; Sheron, Brian; Hollan, Brian
Cc: Perkins, Richard; Bensi, Michelle
Subject: Summary of Call with Duke on GI-204

All,

NRR included me on the conference call with Duke at 10:30 today. A summary of the call is provided below.

The bottom line is that Duke will provide specific concerns to NRR by close of business Monday. In a subsequent conversation with George Wilson and Nancy Salgado, I expressed concern that Monday does not support the schedule for the JLLD SECY on 50.54(f) letters. George and Nancy were going to talk with their management about the schedule.

Ben

Summary of February 8, 2012, 10:30 a.m. Conference Call with Duke On GI-204 Screening Analysis

On the call from the NRC were:

George Wilson, NRC Dam Safety Officer and NRR point for this issue
Nancy Salgado, NRR / DORL Branch Chief for Oconee
John Stang, Oconee PM
Jonathan Bartley, Region II Branch Chief
Andy Sabisch, Oconee Senior Resident
Ben Beasley, RES

George Wilson led the call for NRC. Terry Patterson led the call for Duke. Chris Nolan (Duke) expressed general concern about the sensitivity of the information in the Screening Analysis. He cited the guidance in criterion B of the Critical Infrastructure Information Act of 2002. He felt that the information presented in the Screening Analysis identified a vulnerability at Oconee and should be

critterion B of the Critical Infrastructure Information Act of 2002. He felt that the information presented in the Screening Analysis identified a vulnerability at Oconee and should be withheld under criterion B. Chris stated that discussion of gaps in the licensing basis, core damage frequencies and impacts to the Station were the source of his concern.

Jonathan Bartley pointed out that although much of the information used in the Analysis is available to the public, putting it all together into one place created the sensitivity. Chris Nolan (Duke) echoed that the Analysis does a good job painting the picture which causes the vulnerability. George Wilson responded that the review of the Analysis by the Department of Homeland Security did not reflect those concerns. DHS did not identify anything in the Oconee section of the Analysis as being sensitive.

Terry Patterson (Duke) stated that the Analysis did not use current data. He expressed concern that the utility will have to respond (to the media) based on what is in the Analysis. I pointed out that the Analysis is just a preliminary study using readily available information to determine only whether or not the issue should become a Generic Issue.

Rich Freudenberger (Duke) stated that a few items in the Analysis are not consistent with information in the NRC's January 2011 SER. I replied that, although we are just now issuing the Analysis, it was nearly complete by last January.

George Wilson asked Duke to give us specific input on the statements they felt were sensitive or needed updating. Duke agreed to provide that and asked for a week to prepare their input. George asked for my input on the schedule and I stated that we have a strong need to approve the Generic Issue this week. Duke and NRR agreed on a deadline of close of business Monday.

From: Perkins, Richard
Sent: Thursday, September 13, 2012 3:10 PM
To: Criscione, Lawrence
Subject: RE: Questions

(b)(5)

Richard

From: Criscione, Lawrence
Sent: Thursday, September 13, 2012 2:16 PM
To: Perkins, Richard
Subject: Questions

About what "percent complete" was the GI 204 screening report when you began routing it in March 2011? Obviously, you considered it 100% complete, but approximately how much of it changed (e.g. 1%, 5%, 10%) due to deletions and additions during the routing process.

When did the report first get marked "Not for Public Release"? Was it originally drafted that way? If not, who first requested that it be marked as such and when?

From: Perkins, Richard
Sent: Monday, October 01, 2012 11:25 AM
To: Criscione, Lawrence
Subject: FW: <http://www.nrc.gov/reading-rm/foia/foia-request.html#appeals>

From: King, Mark
Sent: Monday, October 01, 2012 11:08 AM
To: Perkins, Richard
Subject: FW: <http://www.nrc.gov/reading-rm/foia/foia-request.html#appeals>

FYI for your awareness

From: Roth(OGC), David
Sent: Monday, October 01, 2012 10:03 AM
To: King, Mark; Telson, Ross
Subject: <http://www.nrc.gov/reading-rm/foia/foia-request.html#appeals>

One or both of you commented on a recent issue in the news regarding FOIA, NRC, floods, and a claim presented to the IG that a FOIA response was overly-redacted.

(b)(5)

From: Criscione, Lawrence
Sent: Wednesday, October 03, 2012 12:55 PM
To: Criscione, Lawrence
Subject: FW: DVD for Paleoflooding and SOARCA

From: McGee, Jim (HSGAC) [mailto:Jim_McGee@hsgac.senate.gov]
Sent: Wednesday, October 03, 2012 11:13 AM
To: Criscione, Lawrence
Subject: RE: DVD for Paleoflooding and SOARCA

Put them in U. S. mail to my home address. Otherwise, they will get fried in the screening process here.

(b)(6)

Thanks

Jim McGee
Professional Staff/Investigations
Senate Committee on Homeland Security and Governmental Affairs
202-224-2627

From: Criscione, Lawrence [mailto:Lawrence.Criscione@nrc.gov]
Sent: Wednesday, October 03, 2012 10:21 AM
To: McGee, Jim (HSGAC)
Subject: DVD for Paleoflooding and SOARCA

I received the DVD for paleoflooding and SOARCA. I'll see if there's a way to have them "office mailed" to you via the NRC congressional liaison. Otherwise, I'll drop it in the US mail.

From: McGee, Jim (HSGAC) [mailto:Jim_McGee@hsgac.senate.gov]
Sent: Tuesday, October 02, 2012 3:35 PM
To: Criscione, Lawrence
Subject: RE: GI 199 and Mineral, VA earthquake

Thanks. I appreciate your help.

Jim McGee
Professional Staff/Investigations
Senate Committee on Homeland Security and Governmental Affairs
202-224-2627

From: Criscione, Lawrence [mailto:Lawrence.Criscione@nrc.gov]
Sent: Tuesday, October 02, 2012 3:34 PM

To: McGee, Jim (HSGAC)
Subject: RE: GI 199 and Mineral, VA earthquake

I've asked around but haven't heard back yet (it's only been a few hours). I may be able to get these presentations in the coming days.

Larry Criscione

From: McGee, Jim (HSGAC) [mailto:Jim_McGee@hsgac.senate.gov]
Sent: Tuesday, October 02, 2012 9:50 AM
To: Criscione, Lawrence
Subject: RE: GI 199 and Mineral, VA earthquake

Thanks. I couldn't get any of these links to work. I highlighted the topics that appear germane. Will try to track down those slides or DVD's, unless you have them.

Jim McGee
Professional Staff/Investigations
Senate Committee on Homeland Security and Governmental Affairs
202-224-2627

From: Criscione, Lawrence [<mailto:Lawrence.Criscione@nrc.gov>]
Sent: Monday, October 01, 2012 8:00 PM
To: McGee, Jim (HSGAC)
Subject: FW: GI 199 and Mineral, VA earthquake

Jim,

I meant to send this to you a couple of weeks ago, but accidentally sent it to Jon Ake, Marty Stutzke and Ben Beasley (I had "temporarily" put their names in the "To" line to copy down their email addresses).

Anyways, at the very bottom of this email is a list of RES seminars. You might find #99, #102 and #112 interesting pertaining to dam failures, earthquakes and paleofloods.

Larry Criscione

From: Criscione, Lawrence
Sent: Friday, September 21, 2012 2:38 PM
To: Ake, Jon; Beasley, Benjamin; Stutzke, Martin
Subject: GI 199 and Mineral, VA earthquake

Jim,

Below is a list of Seminars given to the Office of Research.

One of them was on the Mineral, VA Earthquake of August 23, 2011. It was given by Dr. Leith of the USGS. The NRC contact was Jon.Ake@nrc.gov, 301-251-7626. He could probably send you the seminar material.

Marty Stutzke (martin.stutzke@nrc.gov, 301-251-7614) was one of the chief scientists on GI 199 (the earthquake Generic Issue) if you have any questions about what was looked at and what the conclusions were. Ben Beasley (Benjamin.Beasley@nrc.gov, 301-251-7676) should be able to either tell you what the status of it is or direct you to a contact in the office assigned to implement it.

Larry

From: Perkins, Richard
Sent: Friday, September 21, 2012 2:19 PM
To: Criscione, Lawrence
Subject: RE: Info

I found this, but there are no slides available. It was recorded.

12/14/10
Success and Failure: A Paradoxical Relationship
Prof. Henry Petroski
Duke University
Nathan Siu
DRA

Here's a copy of the RES Seminar Table through 2009 (if you can read this)

Seminar #114	08/19/12	Long-Term Research Program Overview	Robert Tregoning, Ph.D. Michael B. Rubin, LTRP PM David W. Stroup, P.E. Jacob Philip, P.E	
Seminar #113	08/08/12	The NRC and Social Media – What We're Doing, Why We're Doing It, and How You Can Get Involved [View Poster]	Holly Harrington – Office of Public Affairs	No DVD available for this seminar
Seminar #112	07/10/12	Dam Failure, Nuclear Power Plant Flooding, and the Outlook for Generic Issue 204 [View Slide 1] [View Slide 2] [View Slide 3]	Richard Perkins & Jacob Philip RES/DRA	
Seminar # 111	06/19/12	Training Range Environmental Evaluation and Characterization System (TRECES) Applications - [View Slide]	Billy E. Johnson, U.S. Army Corps of Engineers; Mark S. Dortch, MSD Inc., and Boris Faybishenko, Lawrence Berkeley National Laboratory Sponsored by Tom Nicholson, DRA/RES	No DVD available for this seminar
Seminar # 110	08/07/12	ASR Degradation of Concrete affecting Nuclear Power Plant Structures - [View Slide] [Presentation 1][Presentation 2]	Jason Weiss, Purdue University; Kenneth Snyder, NIST; and Fahim Sadek, NIST. Sponsored by Jacob Philip, ETB/DRA/RES	No DVD available for this seminar
Seminar # 109	08/08/12	Live webcast of Zirconium Fire Experiment on PWR Spent Fuel Pool Complete Loss of Coolant Accident	Ghani Zigh, RES/DSA	No DVD available for this seminar
Seminar #108	6/4/2012	State-of-the-Art Reactor Consequence Analyses (SOCRCA) RES Seminar - [View Slides]	Richard Chang, Jonathan Barr & Jason Schaperow (SOARCA Team)	
Seminar #107	5/21/2012	Health Physics Brown Bag 2012 Series: US Federal Agency Response to Fukushima Incident	Dr. Luis Benevides from NAVY, sponsored by Gladys Figueroa, RES/DSA/RPB	

Seminar #106	4/17/2012	Multi-Scale Assessment of Prediction Uncertainty in Coupled Reactive Transport Models <u>Curtis Flyer Announcement</u>	Gary P. Curtis(USGS) Ming Ye(FSU) Philip D. Meyer(PNNL) Steve Yabusaki(PNNL)	No DVD available for this seminar
Seminar #105	3/27/2012	Development of the Extremely Low Probability of Rupture (xLPR) Assessment Tool <u>View Slides</u>	Dave Rudland, RES/DE	
Seminar #104	2/13/12	The NRC's Simulator-based Human Performance Testing Program -] Advancing Model Validity with Data	Amy D'Agostino & James Chang, RES/DRA	
Seminar #103	1/25/12	Computational Fluid Dynamics for Nuclear Safety Analysis	Christopher Boyd RES/DSA	
Seminar #102	12/13/11	The Mineral, VA Earthquake of August 23, 2011 <u>view poster</u> <u>view presentation</u>	Dr. William Leith, U.S. Geological Survey / Jon Ake, RES/DE/SGSEB	No DVD available for this seminar
Seminar #101	11/01/11	Lessons Learned from Investigations of Oil and Chemical Industry Events <u>View Presentation</u>	Mark Griffon Board Member U.S. Chemical Safety and Hazard Investigation Board	
Seminar #100	10/05/11	Investigations of Zirconium Fires during Spent Fuel Pool Loss of Coolant Accidents	Ghani Zigh RES/DSA	
Seminar #99	08/23/11	The Value of Paleoflood Information when Estimating Flood Risk [Slides] <u>Background Info 1</u> <u>Background Info 2</u>	Dr. Timothy Cohn, U.S. Geological Survey Thomas Nicholson DRA	
Seminar #98	07/11/11	Research Topics and Experiences on Safety Assessment Methods of Radioactive Materials (RAM) Containers German Federal Institute for Materials Research and Testing (BAM) , Berlin, Germany	Dr. Frank Wille, "Requirements for Transport Packages after Interim Storage" Dr. Karsten Muller, "Recent Activities on Experimental Package and Component Testing at BAM" Mr. Gernar Eisenacher "Impact Limiter Modeling - An Approach for a Finite Element Material Model for Wood" Dr. Jose Pires, RES/DE/SGSEB	
Seminar #97	08/21/11	Assuring Durable Concrete: Chemical Degradation Processes and Modeling Service Life - <u>View Slides</u>	Dr. Kenneth A. Snyder National Institute of Standards and Technology Jacob Philip, DRA/ETB	
Seminar #96	04/26/11	Chernobyl 25th Anniversary <u>1. Mike Weber's Introduction</u> <u>2. Dr. Brian Sheron's Presentation</u> <u>3. Dr. Frank Congel's Presentation</u> <u>4. Dr. John Bolce's Presentation</u>	Dr. Brian Sheron, RES Frank Congel, Former NRC Employee Dr. John Bolce, IEI	

Seminar #95	04/19/11	A Probabilistic Risk Assessment View of Consequential Steam Generator Tube Rupture [View Slides]	Selim Sancaktar, RES/DRA/PRAB	No DVD available for this seminar
Seminar #94	02/22/11	Radiation Epidemiology Past Studies and Future Opportunities [View Poster]	Dr. John Boice, Medicine at Vanderbilt University School of Medicine and Scientific Director of the International Epidemiology Institute (IEI) / Stephanie Bush- Goddard, RES/DSA/HEB	
Seminar #93	02/15/11	American Society of Mechanical Engineers [View Slides]	Rick Swayne, ASME Carol Moyer, RES/DE/CMB	
Seminar #92	01/20/11	Weather and Hydrologic Extremes in a Non-stationary Climate with Implications for Managing Critical Infrastructures and Key Resources Presentation Slides	Dr. Auroop Ganguly(ORNL) Joe Kenney (RES/DRA/ETB) Tom Nicholson (RES/DRA)	
Seminar #91	01/12/11	Field and Modeling Studies to Assess Radionuclide Transport in the Subsurface	Dr. Andy Ward, Senior Research Scientist, Pacific Northwest National Laboratory Tom Nicholson (RES/DRA)	
Seminar #90	12/14/10	Success and Failure: A Paradoxical Relationship	Prof. Henry Petroski Duke University Nathan Siu DRA	
Seminar #89	11/10/2010	Zirconium in the Nuclear Industry - [View Slides]	Patrick Raynaud DSA / FSTB	
Seminar #88	10/20/2010	ASME Codes and Standards: History, Content, Development, and Endorsement	Carol Moyer & Gary Stevens, RES/DE	No DVD available for this seminar
Seminar #87	09/23/2010	Seismic-related Generic Issue (GI-199) Safety/Risk Assessment Methods and Results - [Detail] [view Slides]	Marty Stutzke (RES/DRA) Jon Ake (RES/DE/SGSEB) Lauren Killian (RES/DRA/OEGIB)	
Seminar #86	07/23/2010	Risk and Uncertainty in Dam Safety [View Detail 1] [View Detail 2] [View Detail 3]	Professor Gregory B. Baecher University of Maryland, College Park/ Thomas Nicholson, RES/DRA	No DVD available for this seminar
Seminar #85	07/19/2010	The Evolution of Radiation Protection: From Erythema to Genetic Risks to Risks of Cancer [View Slides]	Charles Meinhold / Terry Brock, RES/DSA/HEB	
Seminar #84	07/12/2010	Advanced Control Room Human Factors [View Slides]	Jing Xing & Stephen Flegen RES/ DRA/HFRB	No DVD available for this seminar

Seminar #83	06/17/2010	Severe Accident Response for Steam Generator Tubing [View Slides]	Saurin Majumdar, ANL	No DVD available for this seminar
Seminar #82	06/17/2010	Lean Six Sigma on Internal Contracting	Mary Muessle, PMDA	No DVD available for this seminar
Seminar #81	05/13/2010	Overview of the Electric, Power Research Institute Organizational and Program Structure and its Relationship to the Industry's Materials Initiative	David Modeen / hosted by DE, David Rudland	DVD
Seminar #80	04/29/2010	Lessons Learned in Detecting, Monitoring, Modeling, and Remediating Radioactive Groundwater Contamination at Brookhaven National Laboratory; [Handout]	Dr. William Gunther, Dr. Mike Hauptmann, and Dr. Terry Sullivan / hosted by DRA Thomas Nicholson	DVD
Seminar #79	04/15/2010	Human-Rating of Space Systems - [View Slides]	Mr. Bryan O'Connor, Chief, Office of Safety and Mission Assurance, NASA	No DVD available for this seminar
Seminar #78	03/26/2010	Browns Ferry Seminar	Jack Lewis & Felix Gonzalez, DRA Dr.	DVD
Seminar #77	03/25/2010	Fundamentals of Structural Dynamics - [View Slides]	Dr. Abhinav Gupta	No DVD available for this seminar
Seminar #76	02/23/2010	Recent United States Geological Survey (USGS) Research on Seismic Hazards and Ground Motions in the Eastern U.S.	Dr. Paul Spudich, USGS colleagues & Jon Ake, DE	DVD
Seminar #75	01/21/2010	Improving the State-of-the-Art in Severe Accident Analysis [View Slides]	Richard Lee	No DVD available for this seminar
Seminar #74	01/05/2010	State of the Practice of Seismic Hazard Analysis: From the Good to the Bad	Dr. Norman Abrahamson	DVD
Seminar #73	12/10/2009	Experimental Basis for Modification of Cladding Embrittlement Criteria	Michelle Flanagan	DVD
Seminar #72	11/30/2009	Pressurized Thermal Shock	Mark Kirk	DVD
Seminar #71	10/26/2009	Health Effects as a Function of Dose Rate Delivered [View Slides]	Dr. Jacquelyn Yench, MIT	No DVD available for this seminar
Seminar #70	09/11/2009	THE COLLAPSE OF WORLD TRADE CENTER 7- THE FORGOTTEN BUILDING OF 9/11	Dr. Therese McAllister National Institute of Standards and Technology (NIST)	DVD
Seminar #69	09/08/2009	Geophysical Surveys Supporting Analysis of Contaminant Transport through Fractures [View Slides]	Dr. John Williams, USGS [View Bio]	DVD
Seminar #68	08/24/2009	Safety and Regulatory Perspectives on Protective Coatings for Nuclear Facilities [View Slides]	Bruce Lin, RES/DE/MEEB	DVD
Seminar #67	07/21/2009	Performance of Engineered Covers for Waste Disposal with Implications for PA [View Slides]	Professor Craig Benson, University of Wisconsin [View Bio]	DVD
Seminar #66	05/11/2009	The Spent Nuclear Fuel Burnup Credit Research	John Wagner, ORNL	DVD
Seminar #65	05/07/2009	2009 William B. Joyner Memorial Lecture, entitled "Earthquakes, Seismic Hazard, and Performance-Based Design"	Dr. Robin McGuire	DVD
Seminar #64	04/24/2009	Modeling Uranium Behavior during In-Situ Bioremediation	Steven Yabusaki, Pacific Northwest National Laboratory	No DVD available for this seminar

Seminar #63	04/22/2009	Screening Methods for Estimating Storm-Surge Levels and Severity	Dr. Donald Resio US Army Corps of Engineers	
Seminar #62	03/25/2009	The Accident at Three Mile Island - 30th Anniversary A Look Back: Preserving the Institutional Memory March 25, 2009 [Details] - [Poster] - [View Presentations]	Brian Sheron Edward Frederick Harold Denton Gary Holshan	Please Contact Amy Bonaccorso
Seminar #61	02/10/2009	Perspectives on HTGR Safety and Design Considerations [View Slides]	Dr. Kenneth Stroh (VP, Sentech Inc. and Retired Guest Scientist, LANL)	
Seminar #60	01/21/2009	Modelling of the Dynamics of the Nucleation and Growth of Cracks Initiated due to Stress in Materials	Dr. Appajosula Rao, Material Engineer, DE/CMB	

From: Criscione, Lawrence
Sent: Friday, September 21, 2012 3:09 PM
To: Perkins, Richard
Subject: RE: Info

It was really about how engineering lessons learned are forgotten over time, but the guy giving it used bridge design as his basis. It was in 2010 or 2011. I'm not certain it was a RES seminar. It was in the same auditorium as our seminars and I know I went to it with Kauffman so I assume it was a seminar. Do other offices do seminars?

From: Perkins, Richard
Sent: Friday, September 21, 2012 1:53 PM
To: Criscione, Lawrence
Subject: Info

Energy Daily did a front page story today on FERC standing up a new office. You should take a look at that if you haven't.

I just sent the info on paleofloods (previous e-mail). Let me know if you don't get it.

I don't recall the brief about bridge failure. Anything to help me find it? Didn't see it in the RES seminar list (or I didn't recognize it as bridge failure related).

Richard H. Perkins, P.E.
Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Division of Risk Analysis
Operating Experience and Generic Issues Branch
Phone - 301/251-7479

Criscione, Lawrence

From: Criscione, Lawrence
Sent: Wednesday, October 03, 2012 1:00 PM
To: McGee, Jim (HSGAC)
Cc: Loveless, David
Subject: RE: RES Seminar on GI-204

I haven't looked at the Ft. Calhoun stuff yet, but will likely get to it tomorrow.

A good point of contact on Ft. Calhoun is Dave Loveless (817-200-1161, david.loveless@nrc.gov). He's a Senior Risk Analyst in Region IV (the region headquartered in Arlington, TX which regulates Ft. Calhoun). I haven't spoken to Dave on Ft. Calhoun, but I've heard through the grapevine he has some concerns regarding it.

From: McGee, Jim (HSGAC) [mailto:Jim_McGee@hsgac.senate.gov]
Sent: Wednesday, October 03, 2012 10:22 AM
To: Criscione, Lawrence
Subject: RE: RES Seminar on GI-204

Larry,

Thanks very much for these slides. I'm also looking for all written responses from Duke Energy or NEI re: the issues at Oconee, or the Generic screening study. Anything that sets out their side of the story. I do have the 2010 Duke response to the request for additional information with discussion of merits of sunny day analysis. But before getting underway, I want to be sure I've see any rebuttals from Duke or NEI rebuttal that may be relevant. Also see attached re: regional inspectors and Ft. Calhoun. I'd be interested in your thoughts.

Jim McGee
Professional Staff/Investigations
Senate Committee on Homeland Security and Governmental Affairs
202-224-2627

From: Criscione, Lawrence [mailto:Lawrence.Criscione@nrc.gov]
Sent: Wednesday, October 03, 2012 8:36 AM
To: McGee, Jim (HSGAC)
Subject: RES Seminar on GI-204

From: Criscione, Lawrence
Sent: Wednesday, October 03, 2012 8:18 AM
To: 'McGee, Jim (HSGAC)'
Subject: RE: GI 199 and Mineral, VA earthquake

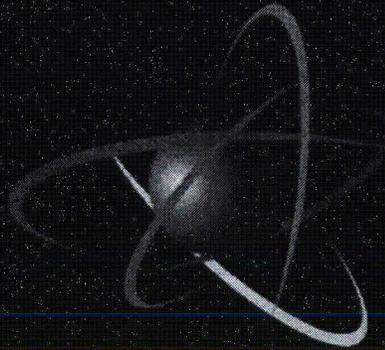
There were 3 slide presentations: Mr. Perkins' slides are publicly available as ML15103A016; Mr. Cook's slides are publicly available as ML15096A119; Mr. Philip's slides are attached.

Jim,

Attached are the slide shows from the RES seminar on GI-204. The presenters were Rich Perkins, Jake Philip and Christopher Cook. Their emails and phone numbers are below. I ordered the DVD but likely won't get it until Oct. 22.

Larry

Richard.Perkins@nrc.gov (301-251-7479)



U.S.NRC

UNITED STATES NUCLEAR REGULATORY COMMISSION

Protecting People and the Environment

RES Seminar

Geotechnical Response to Flooding:
Foundations and Slopes

Jacob Philip

, 301-251-7471

Office of Nuclear Regulatory Research

July 10, 2012

NRC Auditorium



U.S. NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Outline

- **Definitions**
- **Volume/Mass Relationships in Soils**
- **Soil Classification**
- **Soil Gradation**
- **Flooding /Inundation Effects:**
 - ✓ **Footings/Mat Foundations**
 - ✓ **Pile Foundations**
 - ✓ **Slopes: Dams/Embankments/Levees/River Banks**
 - ✓ **Underground Conduits/Tanks/Piping**
 - ✓ **Bearing Capacity**
- **Summary**

Definitions of Soil/Moisture Terminology

Unsaturated Soil

A soil layer is *unsaturated* if some of the pores between soil particles are filled with water.

Saturated Soil

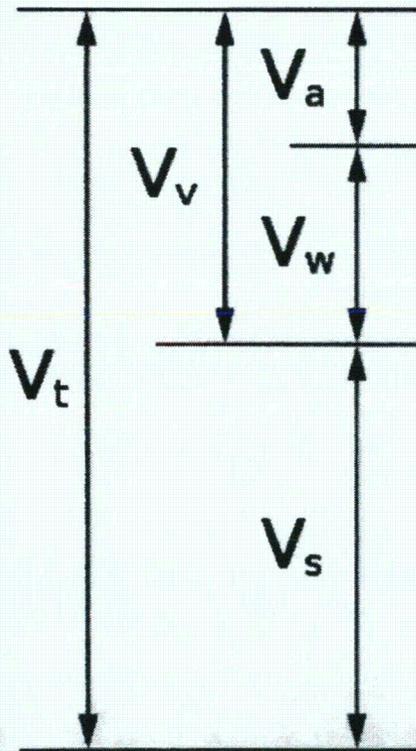
A soil layer is *saturated* if virtually all pores between soil particles are filled with water.

Inundation

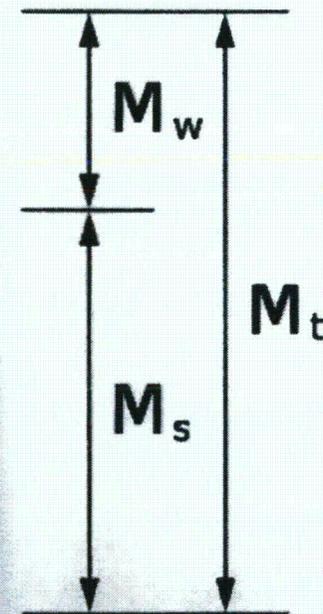
A condition in which water from any source completely covers a land surface.

Volume and Mass Relationships in Soils

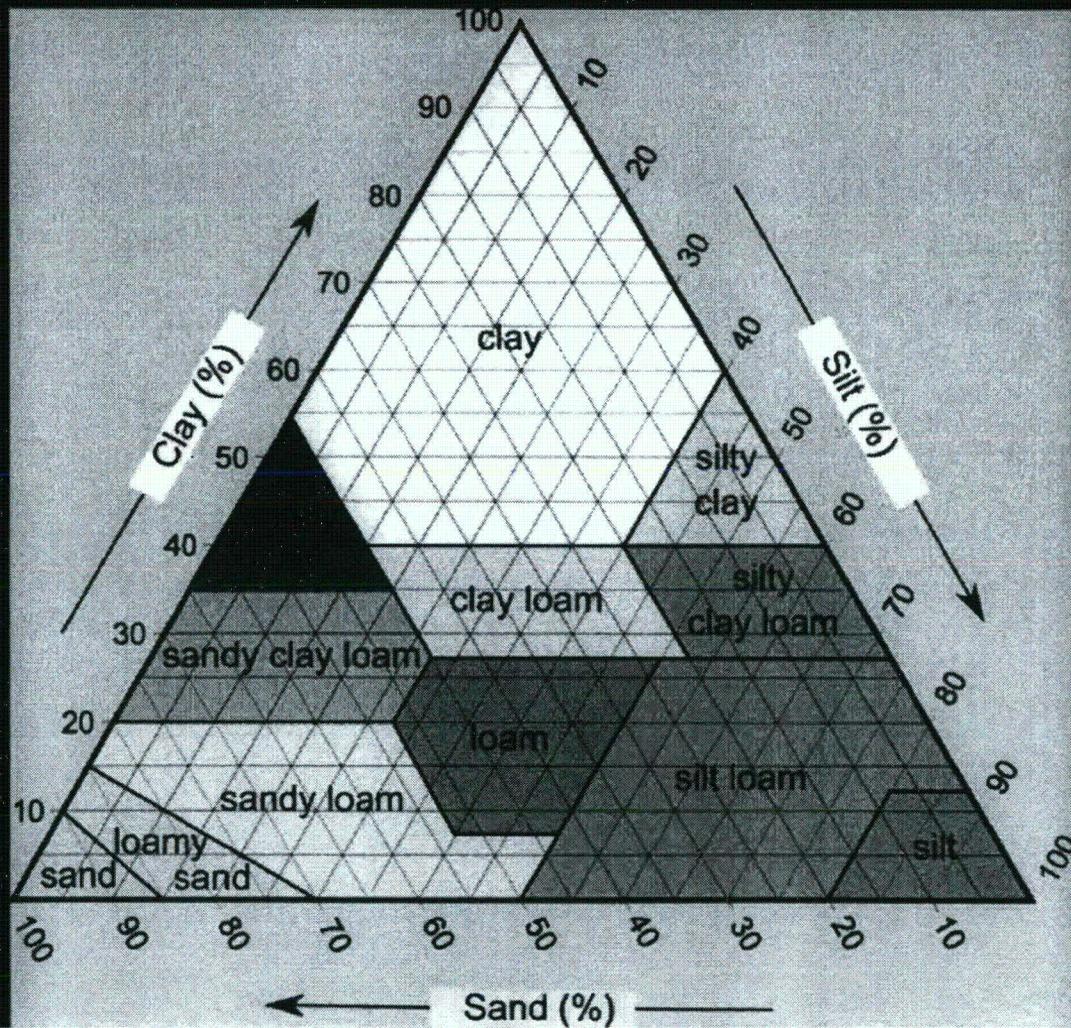
Volume Relationships



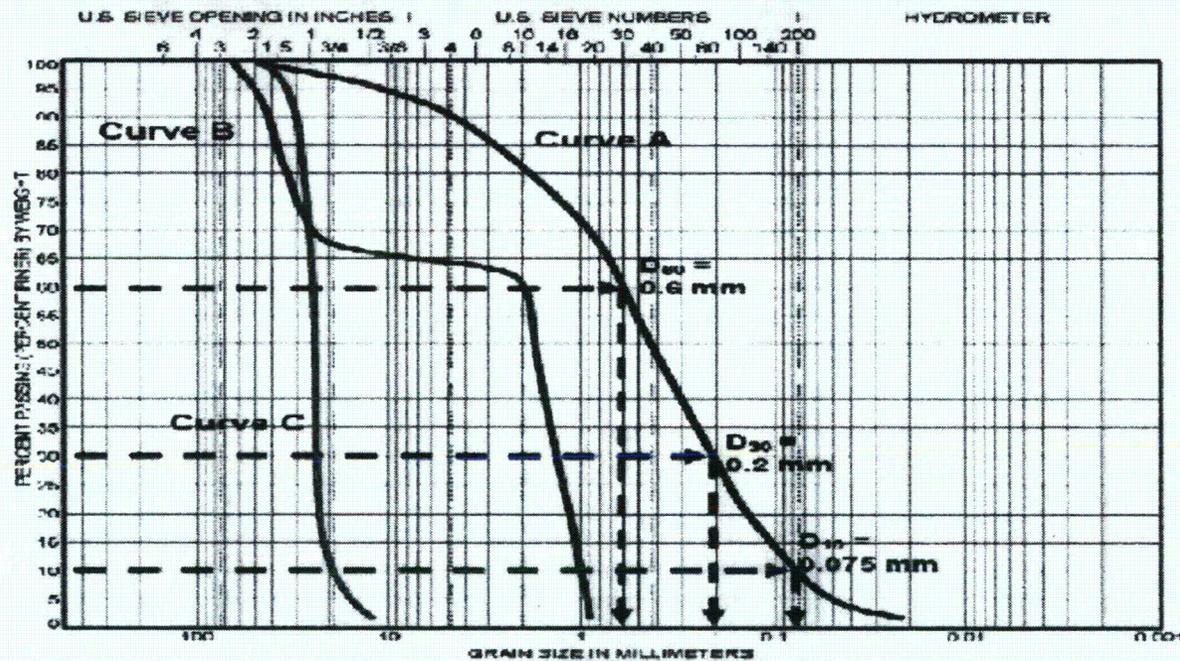
Mass Relationships



Soil Classification Chart



Soil Gradation Curves



COBBLES
GRAVEL
SAND
SILT OR CLAY

Curve	D ₁₀ (mm)	D ₃₀ (mm)	D ₆₀ (mm)	C _u	C _c	Gradation
A	0.075	0.2	0.6	8.0	0.9	Well graded (1)
B	1	1.5	2	2.0	1.12	Poorly graded - Gap graded (2)
C	19	25	27	1.4	1.2	Poorly graded

(1) Soil does not meet C_u and C_c criteria for well-graded soil but GSD curve clearly indicates a well-graded soil

(2) The C_u and C_c parameters indicate a uniform (or poorly) graded material, but the GSD curve clearly indicates a gap graded soil

Note: For clarity only the D₁₀, D₃₀, and D₆₀ sizes for Curve A are shown on the figure.

Consequences of Inundation

Volume of Soil Decreases Suddenly:

Soil Types: **Loess**

Weak Cemented Sands/Silts

Certain Residual Soils

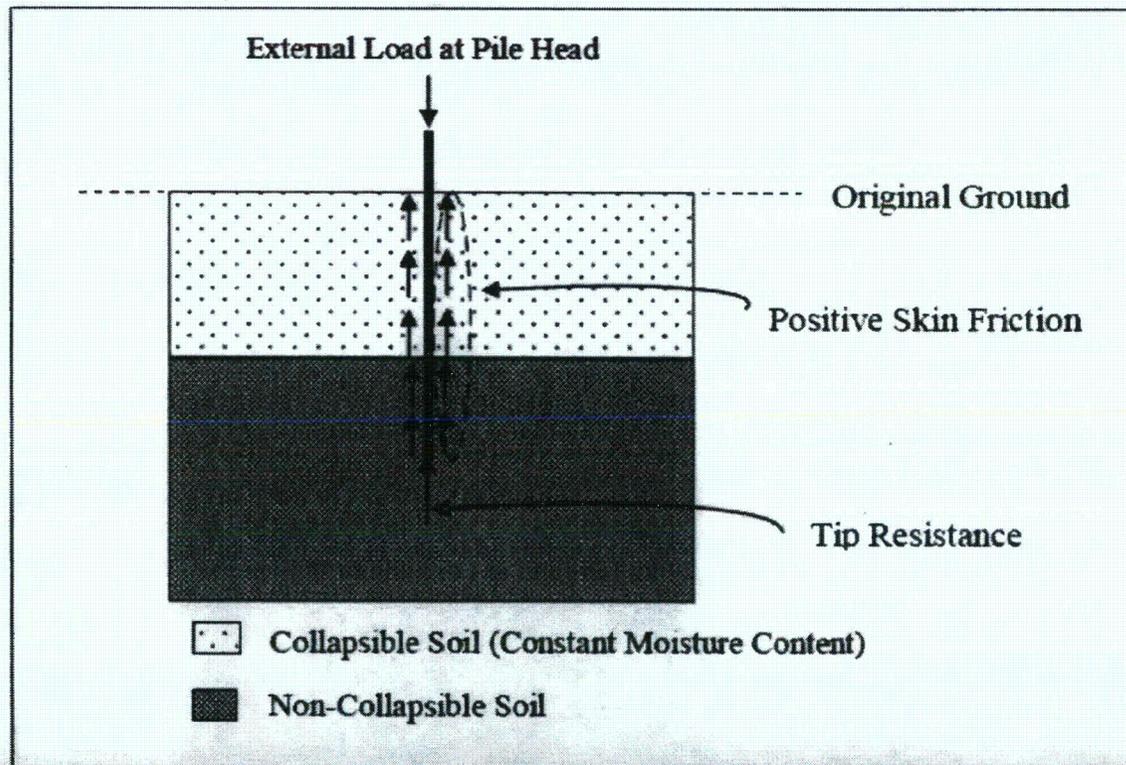
Compacted Soils/Fill

Granular Materials with Angular Particles

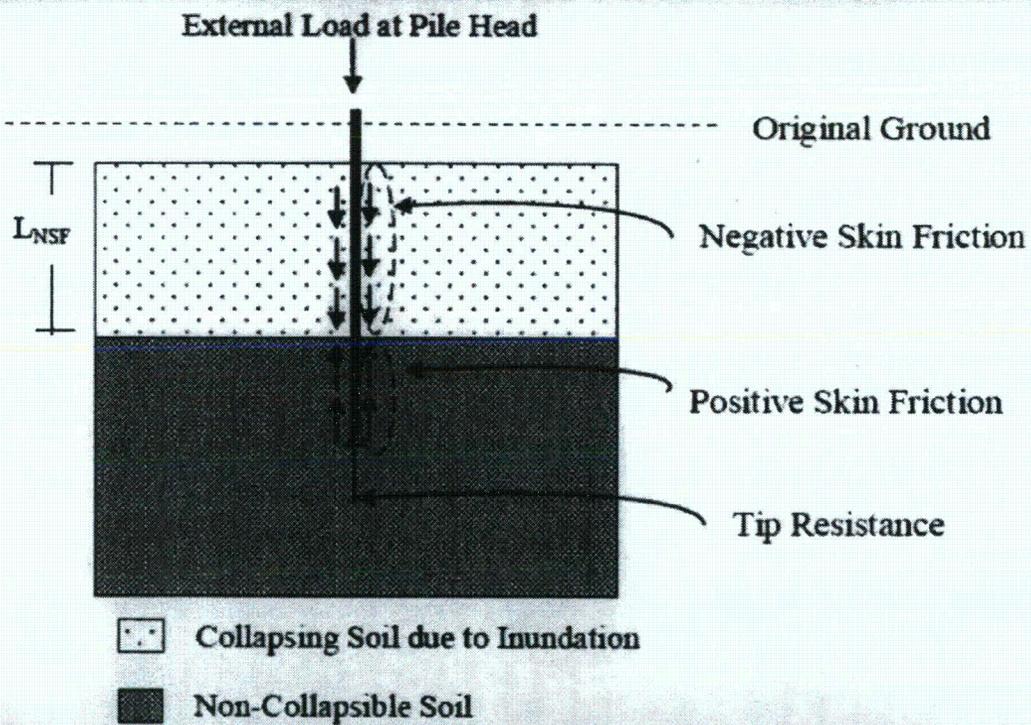
**Soils Compacted Dry of Optimum
Moisture Content**

➤ ***Inundation, Cause: Rainfall, Surface Runoff, Percolation of Rain Water, Poor Drainage, Flooding, Rise in Ground Water, Capillary Rise***

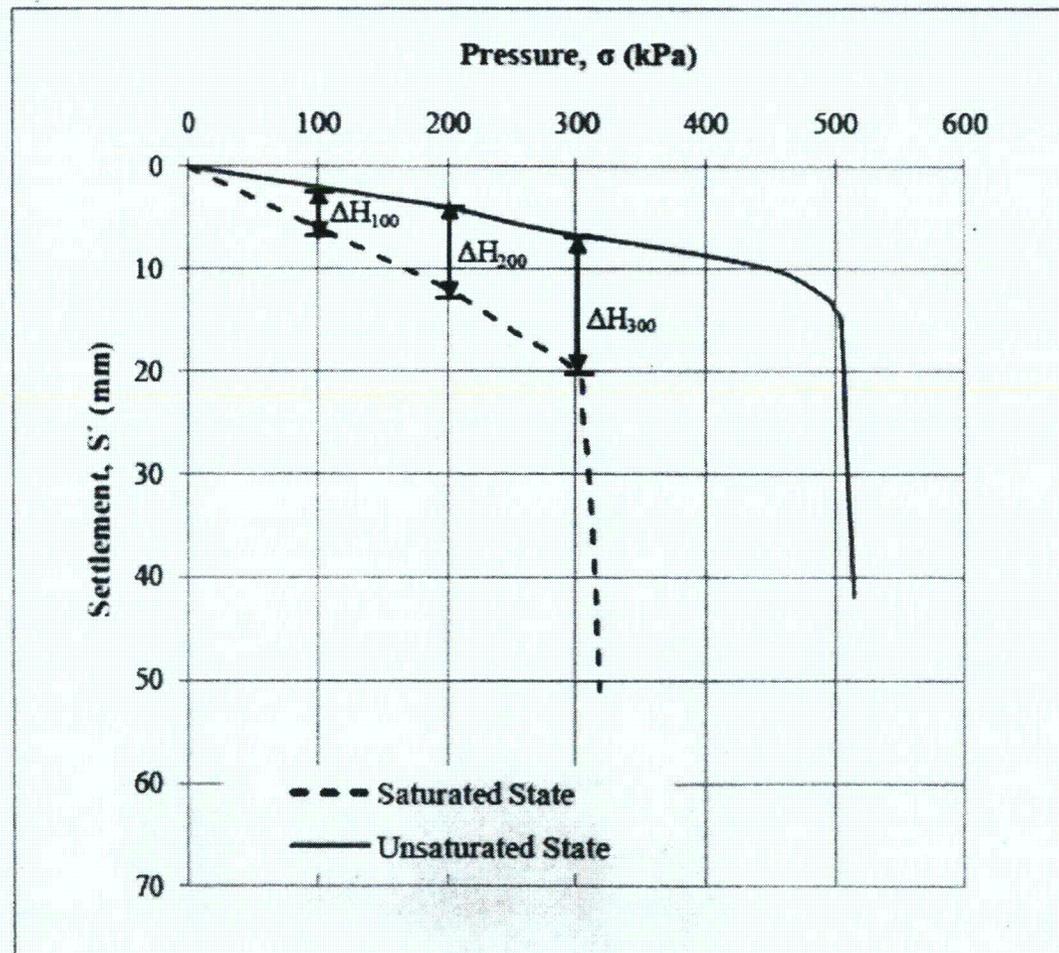
Load Transfer in Pile/Soil System: Constant Moisture Content



Load Transfer in Pile/Soil System: Inundation



Load-Settlement Curve of Foundation: Effect of Inundation



Bearing Capacity

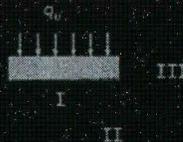


BEARING CAPACITY

TYPES OF SHEAR FAILURE

When uniform load q is applied, soil settles. If $q > q_u$, bearing capacity failure occurs.

(1) **General Shear Failure**: Zone I is pushed downwards, then II and III are pushed sideways then upwards. Failure takes place by sliding, tilting of foundation is possible.



BEARING CAPACITY

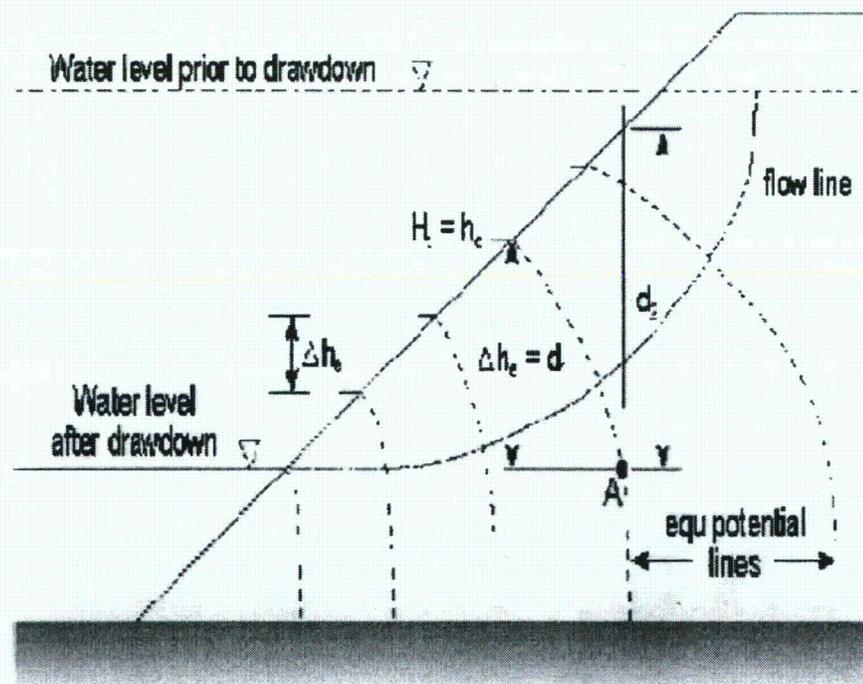
Safe Bearing Capacity is the value of gross pressure that can be applied without danger of shear failure.

Allowable Bearing Capacity (q_a) is the maximum (net) pressure which may be applied to the soil such that:

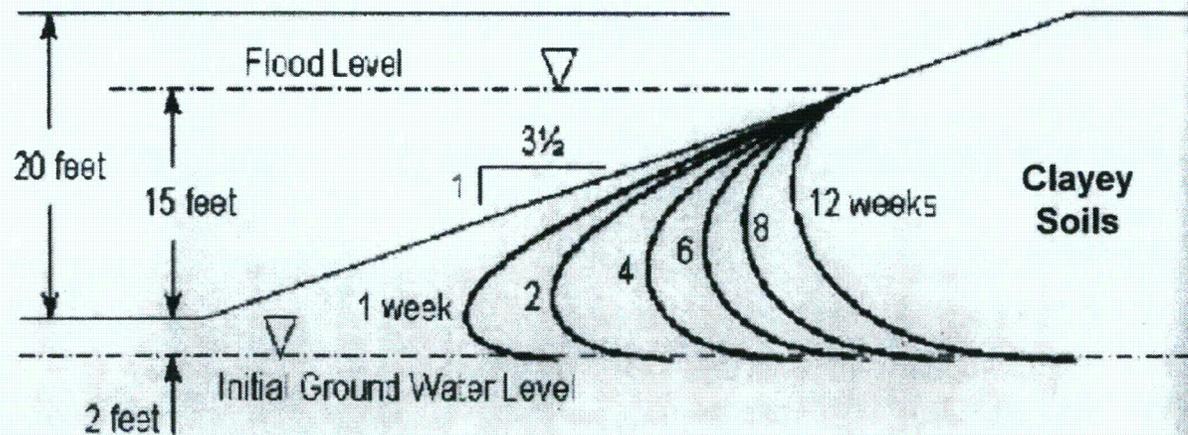
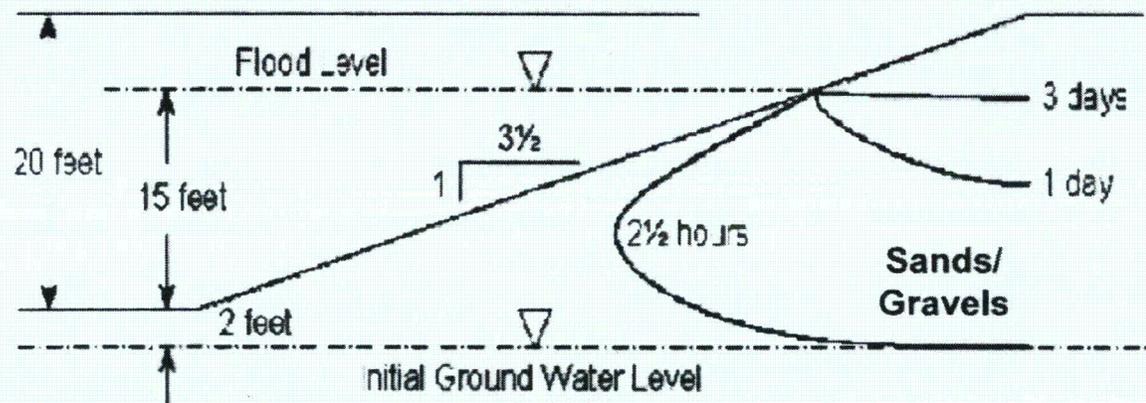
1. F.S. against shear failure of supporting soil is adequate (FS=2 or 3)
2. The total and differential settlements are within permissible limits.

Effects of Inundation on Soil Slopes

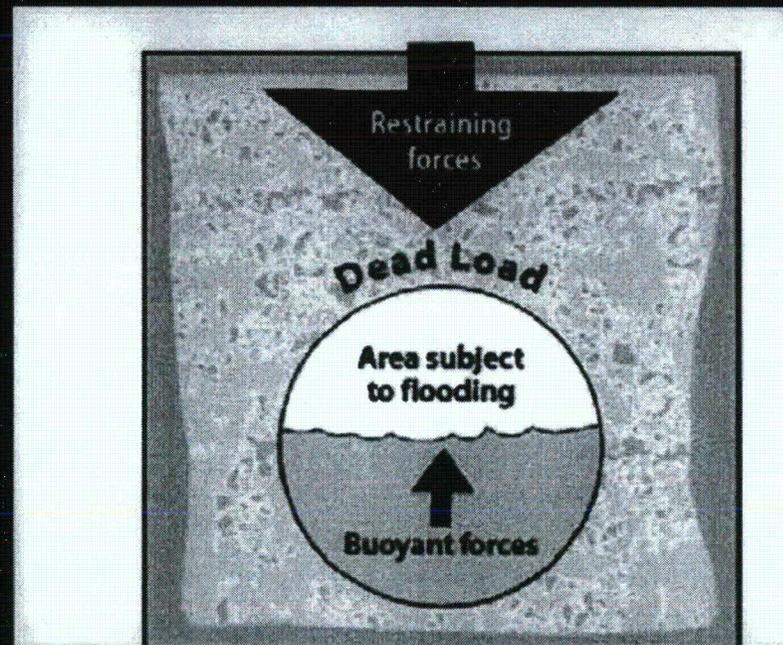
Slope Instability due to Drawdown Conditions:



Effects of Inundation on Soil Slopes (contd)



Effects of Inundation on Underground Structures: Pipes/Tanks/ Conduits



- Buried Structures float when its buoyancy exceeds its weight. These structures are supposed to remain in place when flooded, and need to be restrained. Flotation can put excess stress on weak sections of the underground structure causing severe damage or failure.
- Buried structures are also subject to the same volume reduction in supporting soil bedding/natural soils.

SUMMARY: Effects of Inundation

Change in Soil Properties (Affects Performance of Structures)

Reduction in Soil Volume

Volume Reduction Possible in a Wide Range of Soils

Negative Skin Friction in Pile Foundations

Additional Settlements in Spread Footings/Mat Foundations

Loss of Bearing Capacity

Degradation of Stability of Slopes

Flotation/Settlement of Underground Structures

QUESTIONS???

From: Criscione, Lawrence
Sent: Thursday, October 11, 2012 4:52 PM
To: 'jim_McGee@hsgac.senate.gov'
Subject: RES Seminar on Dam failures
Attachments: Seminar86_July232010_Slides 35-68.ppt

Last half of slide show.

From: Criscione, Lawrence
Sent: Thursday, October 11, 2012 3:44 PM
To: 'jim_McGee@hsgac.senate.gov'
Cc: Nicholson, Thomas; 'gbaecher@umd.edu'
Subject:

Jim,

Attached are the slides from a July 2010 seminar we (NRC/RES) were given by Dr. Gregory Baecher from the University of Maryland. It was a very informative seminar, unfortunately the slides are not very good without the audio and video presentation which accompanied it. I'm working in Texas this week and will be in Illinois next week. I can probably get you the presentation when I am next back in Maryland (Oct. 22nd). Tom Nicholson (Thomas.Nicholson@nrc.gov, 301-251-7498) is the NRC contact. He posted the audio and video on the NRC's internal website but they are too large to email.

Larry Criscione

(b)(6)

From: Perkins, Richard
Sent: Friday, September 21, 2012 2:19 PM
To: Criscione, Lawrence
Subject: RE: Info

I found this, but there are no slides available. It was recorded.

12/14/10
Success and Failure: A Paradoxical Relationship
Prof. Henry Petroski
Duke University
Nathan Siu
DRA

Here's a copy of the RES Seminar Table through 2009 (if you can read this)

Seminar #114	09/19/12	Long-Term Research Program Overview	Robert Tregoning, Ph.D. Michael B. Rubin, LTRP PM David W. Stroup, P.E. Jacob Philip, P.E.	
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C/24

Seminar #113	08/08/12	The NRC and Social Media - What We're Doing, Why We're Doing It, and How You Can Get Involved [View Poster]	Holly Harrington - Office of Public Affairs	No DVD available for this seminar
Seminar #112	07/10/12	Dam Failure, Nuclear Power Plant Flooding, and the Outlook for Generic Issue 204 [View Slide 1] [View Slide 2] [View Slide 3]	Richard Perkins & Jacob Philip RES/DRA	
Seminar #111	08/18/12	Training Range Environmental Evaluation and Characterization System (TRECS) Applications - [View Slide]	Billy E. Johnson, U.S. Army Corps of Engineers; Mark S. Dortch, MSD Inc., and Boris Faybishenko, Lawrence Berkeley National Laboratory Sponsored by Tom Nicholson, DRA/RES	No DVD available for this seminar
Seminar #110	08/07/12	ASR Degradation of Concrete affecting Nuclear Power Plant Structures - [View Slide] [Presentation 1] [Presentation 2]	Jason Weiss, Purdue University; Kenneth Snyder, NIST; and Fahim Sadak, NIST. Sponsored by Jacob Philip, ETB/DRA/RES	No DVD available for this seminar
Seminar #109	08/08/12	Live webcast of Zirconium Fire Experiment on PWR Spent Fuel Pool Complete Loss of Coolant Accident	Ghani Zigh, RES/DSA	No DVD available for this seminar
Seminar #108	6/4/2012	State-of-the-Art Reactor Consequence Analyses (SOCRCA) RES Seminar - [View Slides]	Richard Chang, Jonathan Barr & Jason Schaperow (SOARCA Team)	
Seminar #107	5/21/2012	Health Physics Brown Bag 2012 Series: US Federal Agency Response to Fukushima Incident	Dr. Luis Benevides from NAVY, sponsored by Gladys Figueroa, RES/DSA/RPB	
Seminar #106	4/17/2012	Multi-Scale Assessment of Prediction Uncertainty in Coupled Reactive Transport Models Curtis Flyer Announcement	Gary P. Curtis(USGS) Ming Ye(FSU) Philip D. Meyer(PNNL) Steve Yabusaki(PNNL)	No DVD available for this seminar
Seminar #105	3/27/2012	Development of the Extremely Low Probability of Rupture (xLPR) Assessment Tool View Slides	Dave Rudland, RES/DE	
Seminar #104	2/13/12	The NRC's Simulator-based Human Performance Testing Program - [Advancing Model Validity with Data]	Amy D'Agostino & James Chang, RES/DRA	
Seminar #103	1/25/12	Computational Fluid Dynamics for Nuclear Safety Analysis	Christopher Boyd RES/DSA	
Seminar #102	12/13/11	The Mineral, VA Earthquake of August 23, 2011 [view poster] [view presentation]	Dr. William Leith, U.S. Geological Survey / Jon Ake, RES/DE/SGSEB	No DVD available for this seminar
Seminar #101	11/01/11	Lessons Learned from Investigations of Oil and Chemical Industry Events [View Presentation]	Mark Griffin Board Member U.S. Chemical Safety and Hazard Investigation Board	

Seminar #100	10/05/11	Investigations of Zirconium Fires during Spent Fuel Pool Loss of Coolant Accidents	Ghani Zigh RES/DSA	DVD
Seminar #99	08/23/11	The Value of Paleoflood Information when Estimating Flood Risk [Slides] <u>[Background Info 1]</u> <u>[Background Info 2]</u>	Dr. Timothy Cohn, U.S. Geological Survey Thomas Nicholson DRA	DVD
Seminar #98	07/11/11	Research Topics and Experiences on Safety Assessment Methods of Radioactive Materials (RAM) Containers German Federal Institute for Materials Research and Testing (BAM), Berlin, Germany	Dr. Frank Wille, "Requirements for Transport Packages after Interim Storage" Dr. Karsten Muller, "Recent Activities on Experimental Package and Component Testing at BAM" Mr. Gernar Eisenacher "Impact Limiter Modeling - An Approach for a Finite Element Material Mode I for Wood" Dr. Jose Pires, RES/DE/SGSEB	DVD
Seminar #97	08/21/11	Assuring Durable Concrete: Chemical Degradation Processes and Modeling Service Life - <u>[View Slides]</u>	Dr. Kenneth A. Snyder National Institute of Standards and Technology Jacob Philip, DRA/ETB	DVD
Seminar #96	04/26/11	Chernobyl 26th Anniversary <u>1. Mike Weber's Introduction</u> <u>2. Dr. Brian Sheron's Presentation</u> <u>3. Dr. Frank Congel's Presentation</u> <u>4. Dr. John Boice's Presentation</u>	Dr. Brian Sheron, RES Frank Congel, Former NRC Employee Dr. John Boice, IEI	DVD
Seminar #95	04/19/11	A Probabilistic Risk Assessment View of Consequential Steam Generator Tube Rupture <u>[View Slides]</u>	Selim Sancaktar, RES/DRA/PRAB	No DVD available for this seminar
Seminar #94	02/22/11	Radiation Epidemiology Past Studies and Future Opportunities <u>[View Poster]</u>	Dr. John Boice, Medicine at Vanderbilt University School of Medicine and Scientific Director of the International Epidemiology Institute (IEI) / Stephanie Bush- Goddard, RES/DSA/HEB	DVD
Seminar #93	02/15/11	American Society of Mechanical Engineers <u>[View Slides]</u>	Rick Swayne, ASME Carol Moyer, RES/DE/CMB	DVD
Seminar #92	01/20/11	Weather and Hydrologic Extremes in a Non-stationary Climate with Implications for Managing Critical Infrastructures and Key Resources <u>Presentation Slides</u>	Dr. Auroop Ganguly (ORNL) Joe Kanney (RES/DRA/ETB) Tom Nicholson (RES/DRA)	DVD
Seminar #91	01/12/11	Field and Modeling Studies to Assess Radionuclide Transport in the Subsurface	Dr. Andy Ward, Senior Research Scientist, Pacific Northwest National Laboratory Tom Nicholson (RES/DRA)	DVD
Seminar #90	12/14/10	Success and Failure: A Paradoxical Relationship	Prof. Henry Petroski Duke University Nathan Siu DRA	DVD

Seminar #66	11/10/2010	Zirconium in the Nuclear Industry - [View Slides]	Patrick Reynaud DSA / FSTB	
Seminar #68	10/20/2010	ASME Codes and Standards: History, Content, Development, and Endorsement	Carol Moyer & Gary Stevens, RES/DE	No DVD available for this seminar
Seminar #67	09/23/2010	Seismic-related Generic Issue (GI-199) Safety/Risk Assessment Methods and Results - [Detail] [view Slides]	Marty Stutzke (RES/DRA) Jon Ake (RES/DE/SGSEB) Lauren Killian (RES/DRA/OEGIB)	
Seminar #66	07/23/2010	Risk and Uncertainty in Dam Safety [View Detail 1] [View Detail 2] [View Detail 3]	Professor Gregory B. Baecher University of Maryland, College Park/ Thomas Nicholson, RES/DRA	No DVD available for this seminar
Seminar #65	07/19/2010	The Evolution of Radiation Protection: From Erythema to Genetic Risks to Risks of Cancer [View Slides]	Charles Meinhold / Terry Brock, RES/OSA/HEB	
Seminar #64	07/12/2010	Advanced Control Room Human Factors [View Slides]	Jing Xing & Stephen Flegen RES/ DRA/NFRB	No DVD available for this seminar
Seminar #63	06/17/2010	Severe Accident Response for Steam Generator Tubing [View Slides]	Saurin Majumdar, ANL	No DVD available for this seminar
Seminar #62	06/17/2010	Lean Six Sigma on Internal Contracting	Mary Muesle, PMDA	No DVD available for this seminar
Seminar #61	05/13/2010	Overview of the Electric, Power Research Institute Organizational and Program Structure and its Relationship to the Industry's Materials Initiative	David Modeen / hosted by DE, David Rudland	
Seminar #60	04/29/2010	Lessons Learned in Detecting, Monitoring, Modeling, and Remediating Radioactive Groundwater Contamination at Brookhaven National Laboratory; [Handout]	Dr. William Gunther, Dr. Mike Hauptmann, and Dr. Terry Sullivan / hosted by DRA Thomas Nicholson	
Seminar #76	04/15/2010	Human-Rating of Space Systems - [View Slides]	Mr. Bryan O'Connor, Chief, Office of Safety and Mission Assurance, NASA	No DVD available for this seminar
Seminar #78	03/26/2010	Browns Ferry Seminar	Jack Lewis & Felix Gonzalez, DRA Dr.	
Seminar #77	03/25/2010	Fundamentals of Structural Dynamics - [View Slides]	Dr. Abhinav Gupta	No DVD available for this seminar
Seminar #76	02/23/2010	Recent United States Geological Survey (USGS) Research on Seismic Hazards and Ground Motions in the Eastern U.S.	Dr. Paul Spudich, USGS colleagues & Jon Ake, DE	
Seminar #75	01/21/2010	Improving the State-of-the-Art in Severe Accident Analysis [View Slides]	Richard Lee	No DVD available for

				this seminar
Seminar #74	01/05/2010	State of the Practice of Seismic Hazard Analysis: From the Good to the Bad	Dr. Norman Abrahamson	DVD
Seminar #73	12/10/2009	Experimental Basis for Modification of Cladding Embrittlement Criteria	Michelle Flanagan	DVD
Seminar #72	11/30/2009	Pressurized Thermal Shock	Mark Kirk	DVD
Seminar #71	10/29/2009	Health Effects as a Function of Dose Rate Delivered [View Slides]	Dr. Jacquelyn Yench, MIT	No DVD available for this seminar
Seminar #70	09/11/2009	THE COLLAPSE OF WORLD TRADE CENTER 7- THE FORGOTTEN BUILDING OF 9/11	Dr. Theresa McAllister National Institute of Standards and Technology (NIST)	DVD
Seminar #69	09/08/2009	Geophysical Surveys Supporting Analysis of Contaminant Transport through Fractures [View Slides]	Dr. John Williams, USGS [View Bio]	DVD
Seminar #68	08/24/2009	Safety and Regulatory Perspectives on Protective Coatings for Nuclear Facilities [View Slides]	Bruce Lin, RES/DE/MEEB	DVD
Seminar #67	07/21/2009	Performance of Engineered Covers for Waste Disposal with Implications for PA [View Slides]	Professor Craig Benson, University of Wisconsin [View Bio]	DVD
Seminar #66	05/11/2009	The Spent Nuclear Fuel Burnup Credit Research	John Wagner, ORNL	DVD
Seminar #65	05/07/2009	2009 William B. Joyner Memorial Lecture, entitled "Earthquakes, Seismic Hazard, and Performance-Based Design"	Dr. Robin McGuire	DVD
Seminar #64	04/24/2009	Modeling Uranium Behavior during In-Situ Bioremediation	Steven Yabusaki, Pacific Northwest National Laboratory	No DVD available for this seminar
Seminar #63	04/22/2009	Screening Methods for Estimating Storm-Surge Levels and Severity	Dr. Donald Reslo US Army Corps of Engineers	DVD
Seminar #62	03/25/2009	The Accident at Three Mile Island - 30th Anniversary A Look Back: Preserving the Institutional Memory March 26, 2009 [Details] - [Poster] - [View Presentations]	Brian Sharon Edward Frederick Harold Denton Gary Holahan	Please Contact Amy Bonaccorso
Seminar #61	02/10/2009	Perspectives on HTGR Safety and Design Considerations [View Slides]	Dr. Kenneth Stroh (VP, Sentech Inc. and Retired Guest Scientist, LANL)	DVD
Seminar #60	01/21/2009	Modeling of the Dynamics of the Nucleation and Growth of Cracks Initiated due to Stress in Materials	Dr. Appajosula Rao, Material Engineer, DE/CMB	DVD

From: Criscione, Lawrence
Sent: Friday, September 21, 2012 3:09 PM
To: Perkins, Richard
Subject: RE: Info

It was really about how engineering lessons learned are forgotten over time, but the guy giving it used bridge design as his basis. It was in 2010 or 2011. I'm not certain it was a RES seminar. It was in the same auditorium as our seminars and I know I went to it with Kauffman so I assume it was a seminar. Do other offices do seminars?

From: Perkins, Richard
Sent: Friday, September 21, 2012 1:53 PM
To: Criscione, Lawrence
Subject: Info

Energy Daily did a front page story today on FERC standing up a new office. You should take a look at that if you haven't.

I just sent the info on paleofloods (previous e-mail). Let me know if you don't get it.

I don't recall the brief about bridge failure. Anything to help me find it? Didn't see it in the RES seminar list (or I didn't recognize it as bridge failure related).

Richard H. Perkins, P.E.
Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Division of Risk Analysis
Operating Experience and Generic Issues Branch
Phone - 301/251-7479

From: Vrahoretis, Susan
Sent: Tuesday, October 16, 2012 10:17 AM
To: Criscione, Lawrence
Cc: Zimmerman, Jacob
Subject: RE: Inadequately Sized Flood Wall at Oconee Nuclear Station Could Lead to Fukushima Scenario in the Event of a Failure of the Lake Jocassee Dam

Dear Mr. Criscione,

Chairman Macfarlane has referred this matter to the Inspector General's office.

Thank you,

Susan

Susan H. Vrahoretis
Legal Counsel
Office of Chairman Allison M. Macfarlane United States Nuclear Regulatory Commission
Office: O17D07
E-mail: Susan.Vrahoretis@nrc.gov | Office: (301) 415-1834 |

From: Criscione, Lawrence
Sent: Tuesday, September 18, 2012 7:25 PM
To: Macfarlane, Allison; clerner@osc.gov; Bell, Hubert; Lee, David; Zobler, Marian; Wiggins, Jim
Cc: matt_buckham@demint.senate.gov; homeland.security@mail.house.gov; michael.kiko@mail.house.gov; peter.spencer@mail.house.gov; valerie_manak@epw.senate.gov; nathan_mccray@epw.senate.gov; devon.hill@mail.house.gov; gracela.tatane@mail.house.gov; stephen.salsbury@mail.house.gov; jim_mcgee@hsgac.senate.gov; marty.gelfand@mail.house.gov; vic.edgerton@mail.house.gov; michal.freedhoff@mail.house.gov; Bernhard, Rudolph; Ferrante, Fernando; Hanna, John; Kanney, Joseph; Kozak, Laura; Loveless, David; Marksberry, Don; Mitman, Jeffrey; Passehl, Dave; Schmidt, Wayne; Vaughn, Stephen; Wood, Jeffery; Zoulis, Antonios; Galloway, Melanie; Giitter, Joseph; Leeds, Eric; Wilson, George; Perkins, Richard; Bensi, Michelle; Phillip, Jacob; Sancaktar, Selim; Ottenberg, Geoffrey; Ellis, Kevin; Beasley, Benjamin; Demoss, Gary; Coyne, Kevin; Coe, Doug; Correia, Richard
Subject: Inadequately Sized Flood Wall at Oconee Nuclear Station Could Lead to Fukushima Scenario in the Event of a Failure of the Lake Jocassee Dam

Chairman Macfarlane,

Please see the attached letter. I apologize for its length but it is written for a broad audience and concerns some technically complex issues with six years of regulatory background.

The risk that a core meltdown will occur at the Oconee Nuclear Station (ONS) is ten times greater than at similarly designed US reactor plants and the risk of a containment breach leading to significant public dose is 500 times greater.

ONS lies eleven miles downstream of the Lake Jocassee Dam. Since 2006 the NRC has known of a harrowing liability: a failure of Jocassee Dam would lead to all three reactors at ONS melting down within 10 hours and a potential breach of the containment buildings within 68 hours. This is very similar to the events which occurred at Fukushima Dai-ichi in 2011.

I am not directly involved with this issue. My involvement stems from concerns of a co-worker that serious safety concerns regarding ONS are being illegally withheld from the public under the guise of "Security-Related Information". My knowledge of this issue comes entirely from a cursory review of documents in ADAMS. From that review it is clear that:

Despite knowing about the significant risk posed by a failure of Jocassee Dam since 2006, no efforts have yet been taken to substantially lower those risks. Although interim actions are being taken at Duke Energy, they are not of a nature that significantly lowers the risks to a par with typical US reactor plants.

Most of the documents pertaining to this safety concern are not publicly available due to being stamped "Security-Related Information". However, none of these documents discuss security topics at all. Terrorism, sabotage, vandalism or any other intruder or insider threat are not mentioned. These documents deal wholly with the failure of Jocassee Dam due to natural phenomena or latent engineering/construction flaws.

The annual risk of core damage at ONS is on the order of $1E-4$ /year and the annual risk of core damage followed by containment failure is on the order of $1E-5$ /year.

The items below are also apparent from the documents I have reviewed, although it is possible these items have been done and I have merely not located the documents affirming them:

1. After six years, the NRC does not have an accurate risk model of ONS which takes into account the liabilities posed by a failure of Jocassee Dam.
2. After six years, the NRC does not have an accurate assessment of the probability that ONS operators can prevent a containment failure in the 49 to 58 hours between the recession of the flood waters and the failure of the containment structures.
3. The original due date for constructing adequate flood protection was November 30, 2011. After the Fukushima Dai-ichi accident, instead of being prioritized this due date has been extended to 2016. That's ten years after we first became aware of the liability.

Please note that the above three items are conjecture on my part as I have not been involved in any of the NRC discussions concerning this issue and it is likely there are many documents in ADAMS which I failed to find and review. However, from the documents I have reviewed, it is apparent to me that the above statements are true. The technical staff involved in this issue (i.e. whose names appear on the ADAMS documents) are Eric Leeds, Joseph Glitter, Melanie Galloway, George Wilson, Jeff Mitman as well as others. I have not spoken to any of these people other than Jeff Mitman and my short conversation with Jeff last Thursday was merely to get an understanding of the current status of the Jocassee Dam/ONS flood protection issue (i.e. I didn't want to bother writing to you if they have broken ground and actually started installing adequate flood protection). These individuals should be able to inform you of the specifics of the Jocassee Dam issue. I have copied them on this email and encourage them to inform you of any items in my letter which are not accurate. It is not my intent to misrepresent anybody, but being an outsider on this issue it is possible that I have.

The purpose of the attached letter is to (1) bring to your attention the issues regarding Jocassee Dam, (2) inform our congressional oversight committees of concerns I have that the NRC is not addressing the liabilities at ONS in a timely manner, and (3) bring to your attention that I support Richard Perkins' allegation that the issues surrounding Jocassee Dam have been inappropriately categorized as "Security-Related Information".

Although as an agency we tend to refer to them in the same breath, security and safety are separate issues. All manmade structures, no matter how well built, can be destroyed by some level of terrorist action if left unprotected. The solutions to terrorist threats are security measures that assess the credible threat and that guard access to critical areas sufficient to the assessed threat level. Construction margins and "defense-in-depth" modifications are the solutions to safety concerns not security concerns. The issues regarding Jocassee Dam are about construction margins – that is, is the dam constructed to typical margins (supporting

a $2.8E-4$ /year failure rate) or to some type of exceptional margins. They have nothing to do with the necessity of whether or not security measures need to be taken to avert a terrorist threat. If the fact that ONS lies 11 miles downstream of Jocassee Dam makes it a security liability, then separate from the safety concerns discussed in my letter the NRC and the Department of Homeland Security need to secretively address security measures to protect the dam. After six years it is unacceptable to withhold vital safety liabilities from public disclosure solely because there may have been a possibility of a security threat. If there is a security vulnerability, then I would hope that it was addressed within months of us becoming aware of this issue in 2006. If anyone within the NRC believes there is still an unaddressed security liability, then separate from the safety solutions (e.g. building an adequately sized flood wall) the NRC should be ensuring that appropriate protective measures are in place to protect Jocassee Dam – merely withholding basic information regarding nuclear safety from public view is not the way to address a security threat.

V/r,

Lawrence S. Criscione, PE
NRC/RES/DRA/OEGIB

(b)(6)

From: Perkins, Richard
Sent: Monday, October 17, 2011 3:41 PM
To: Criscione, Lawrence
Subject: FW: Finalized Agenda for October 2011 SRA Counterpart Meeting at Region 1 Office, King of Prussia, PA.
Attachments: October 2011 SRA Counterpart Agenda 101411.docx

From: Wong, See-Meng
Sent: Friday, October 14, 2011 4:21 PM
To: Cook, William; Cahill, Christopher; Hanna, John; MacDonald, George; Bernhard, Rudolph; Rogers, Walt; Kozak, Laura; Passehl, Dave; Valos, Nicholas; Runyan, Michael; Replogle, George; Loveless, David; Sancaktar, Selim; Applgnani, Peter; Wood, Jeffery; Peters, Sean; Kauffman, John; Perkins, Richard; Phillip, Jacob; Helton, Donald; Stroup, David; Hyslop, JS; Barrett, Harold; Collins, Timothy; Vaughn, Stephen; Chung, Donald; Circle, Jeff; Ferrante, Fernando; Mitman, Jeffrey; Zoulis, Antonios; Ireland, JoAnn
Cc: Schmidt, Wayne; Marksberry, Don; Weerakkody, Sunil; Harrison, Donnie; Klein, Alex; Franovich, Rani; Coyne, Kevin; Demoss, Gary; Beasley, Benjamin; Salley, MarkHenry; Lee, Samson; Coe, Doug
Subject: Finalized Agenda for October 2011 SRA Counterpart Meeting at Region 1 Office, King of Prussia, PA.

All,

Attached is the finalized Agenda for the October 2011 SRA Counterpart Meeting at NRC Region 1 Office, King of Prussia, PA from October 18-21, 2011. The schedule of presentations has been adjusted to accommodate the VTC availability for RES presenters who were unable to travel. Nevertheless, we have telecom connection available for anyone who are interested in listening to the presentations and discussions during the meeting.

The VTC connection from Region 1 Office to Church Street Building is available to Room 2C19 (or 4C19) from 8:00am to 4:30pm on Tuesday, October 18, 2011. Contact Don Marksberry, 301-251-7593 for latest information on the CSB VTC room on Tuesday. There are no VTC arrangements on Wednesday and Thursday due to conflict with NRC All-Hands Meeting.

The telecom call-in number is 1-800-648-4689, Passcode (b)(6) (15 lines), meeting ID: 1112. The telecom connection is available from 7:45am to 4:30pm Eastern Standard Time from October 18-20, 2011. Contact Wayne Schmidt, 610-337-5315 if you have problems with the telecom connection.

Since we are having the Counterpart Meeting next week, the SRA monthly call on Monday, October 17, 2011 is **CANCELLED**.

I look forward to meeting all of you who are attending this meeting at 8:00am, Tuesday, October 18, 2011. Thank you to all presenters for their presentations at this meeting.

See Meng.

**Senior Reactor Analyst Counterpart Meeting
Region 1 Office, King of Prussia, PA
October 18-20, 2011**

Tuesday, October 18, 2011

Morning Session

8:00 a.m. – 8:30 a.m.	Welcome and Opening Remarks – David Lew, Deputy Regional Administrator, Region 1
8:30 a.m. – 9:00 a.m.	DRA Remarks – Joseph Giitter, Division Director, DRA, NRR.
9:00 a.m. – 9:45 a.m.	All-Hazards SPAR Model – Selim Sancaktar, RES, Fernando Ferrante, NRR
9:45 a.m. – 10:00 a.m.	Break
10:00 a.m. – 10:30 a.m.	Support System Initiating Event Models – Peter Appignani, RES
10:30 a.m. – 11:00 a.m.	SAPHIRE 8 Update – Jeff Wood, RES
11:00 a.m. – 11:45 a.m.	Human Reliability Analysis (HRA) Research – Sean Peters, RES
11:45 a.m. – 1:00 p.m.	Lunch

Afternoon Session

1:00 p.m. – 2:00 p.m.	Generic Issue 204: Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures – John Kaufman, Richard Perkins, RES
2:00 p.m. – 3:00 p.m.	Regulatory Guide Revisions Pertinent to Flooding Issues at Nuclear Power Plants – Jacob Phillip, RES
3:00 p.m. – 3:15 p.m.	Break
3:15 p.m. – 4:00 p.m.	Emerging Topics in PRA Research – Don Helton, RES
4:00 p.m. – 4:30 p.m.	Risk Tools Network (RTN) Project – Sunil Weerakoddy, NRR

ENCLOSURE

Wednesday, October 19, 2011

Morning Session

8:15 a.m. - 9:30 a.m. Fire Research: Cable Fire Testing, Fire Modeling, Verification and Validation and Other Projects – David Stroup, RES

9:30 a.m. - 10:00 a.m. Updating Fire PRA Methods: NUREG/CR 6850; Enhanced Fire Events Database to Support Fire PRA – J.S. Hyslop, NRR

10:00 a.m. - 10:15 a.m. Break

10:15 a.m. - 11:00 a.m. Unresolved Analysis in Fire PRA Methods – J.S. Hyslop, NRR

11:00 a.m. - 11:45 a.m. Incipient Fire Detection Systems – Harold Barrett, NRR

11:45 a.m. - 1:00 p.m. Lunch

Afternoon Session

1:00 p.m. – 1:45 p.m. NFPA-805 Pilot Program Lessons Learned – Harold Barrett, NRR

1:45 p.m. – 2:45 p.m. NFPA 805 Inspections: Inspection Procedures and Pilot Plant Lessons Learned – Harold Barrett, NRR

2:45 p.m. – 3:00 p.m. Break

3:00 p.m. – 4:45 p.m. SRA Round Table:

- Near-Term Task Force Recommendations – See-Meng Wong, Timothy Collins, NRR
- Lessons Learned: Ft. Calhoun Flooding Issue – David Loveless, Region 4
- Palisades Loss of DC Event – Dave Passehl, Region III
- Harris NFPA-805 Inspection – George MacDonald, Region II
- Wrap-Up – Wayne Schmidt, Region I

Thursday, October 20, 2011

Morning Session

- | | |
|--------------------------------|--|
| 8:30 a.m. - 9:30 a.m. | Inspection Manual Chapter 0609 Appendix A Revisions: Phase 1 and Phase 2 Process – Steve Vaughn, NRR |
| 9:30 p.m. - 10:00 a.m. | Inspection Manual Chapter 0609 Appendix F Revisions – Jeff Circle, NRR |
| 10:00 a.m. - 10:15 a.m. | Break |
| 10:15 a.m. – 10:45 a.m. | Inspection Manual Chapter 0609 Appendix G Revisions and RTN Action Items – Jeff Mitman, NRR |
| 10:45 a.m. – 11:30 a.m. | Outline of Common Cause Failure (CCF) Analysis Guidance in RASP Handbook – See Meng Wong, NRR, Don Marksberry, RES, and Laura Kozak, Region 3 |
| 11:30 a.m. – 12:00 noon | Closing Remarks – Christopher Miller, Director, DRS, Region 1 |

Criscione, Lawrence

From: Criscione, Lawrence
Sent: Tuesday, October 23, 2012 11:44 AM
To: 'Freedhoff, Michal'
Subject:
Attachments:

Outside of Scope

Outside of Scope

Outside of Scope

Outside of Scope

Larry Criscione

(b)(6)

From: McGee, Jim (HSGAC) [mailto:Jim_McGee@hsgac.senate.gov]
Sent: Wednesday, October 03, 2012 10:22 AM
To: Criscione, Lawrence
Subject: RE: RES Seminar on GI-204

Larry,

Thanks very much for these slides. I'm also looking for all written responses from Duke Energy or NEI re: the issues at Oconee, or the Generic screening study. Anything that sets out their side of the story. I do have the 2010 Duke response to the request for additional information with discussion of merits of sunny day analysis. But before getting underway, I want to be sure I've see any rebuttals from Duke or NEI rebuttal that may be relevant. Also see attached re: regional inspectors and Ft. Calhoun. I'd be interested in your thoughts.

Jim McGee
Professional Staff/Investigations
Senate Committee on Homeland Security and Governmental Affairs
202-224-2627

From: Criscione, Lawrence [<mailto:Lawrence.Criscione@nrc.gov>]
Sent: Wednesday, October 03, 2012 8:36 AM
To: McGee, Jim (HSGAC)
Subject: RES Seminar on GI-204

From: Criscione, Lawrence
Sent: Wednesday, October 03, 2012 8:18 AM
To: 'McGee, Jim (HSGAC)'
Subject: RE: GI 199 and Mineral, VA earthquake

Jim,

Attached are the slide shows from the RES seminar on GI-204. The presenters were Rich Perkins, Jake Philip and Christopher Cook. Their emails and phone numbers are below. I ordered the DVD but likely won't get it until Oct. 22.

Larry

Richard.Perkins@nrc.gov (301-251-7479)

From: Criscione, Lawrence
Sent: Tuesday, October 23, 2012 5:18 PM
To: Perkins, Richard
Subject: FW: NRC Ignoring Perceived Security Concerns Regarding Jocassee Dam?
Attachments: Ignoring Perceived Security Concerns Regarding Jocassee Dam.pdf

Heard from Ed that Randy Sullivan works in NSIR. That's probably why he is concerned with security.

From: Criscione, Lawrence
Sent: Tuesday, October 23, 2012 5:17 PM
To: Sullivan, Randy
Subject: FW: NRC Ignoring Perceived Security Concerns Regarding Jocassee Dam?

Randy,

Please see the attached letter regarding "security" concerns at Jocassee Dam and Oconee Nuclear Station.

To me, it's simple: either there is a security threat or there is not. If there is not, then we need to quit withholding all the SAFETY related correspondence between us and Duke Energy under the guise of "security". If there is a security concern then we need to order Duke Energy to shut down its Oconee reactors until the security concern is addressed.

It might sound like a big deal to shut down reactors, but since Duke owns the dam that is not what they need to do – however, it is our only tool since we don't regulate the dam. If we order Duke to shut down the reactors until the security concerns are addressed, then they will lower the level of Lake Jocassee (it's a pumped storage impound) until the volume of water impounded does not threaten the reactors, and then they will cease operation of the pumped storage station until they get the flood wall around Oconee adequately sized to survive a dam break.

It is hypocritical of us to claim that the security threat is sooooooo serious that we must redact any mention of the safety hazards posed by Jocassee Dam but then, at the same time, do nothing to address the security threat.

I've never worked in security. If you have any insights for me, I would appreciate hearing them.

Larry Criscione

(b)(6)

From: (b)(6)
To: pete.king@mail.house.gov; jim.mcgee@hsgac.senate.gov; david.bibeau@collins.senate.gov; homeland.security@mail.house.gov; nicole.johnson@mail.house.gov; peter.spencer@mail.house.gov; stephen.salsbury@mail.house.gov; chairman@nrc.gov; carolyn.lerner@osc.gov; corradin@cae.wisc.edu; ellisjo@inpo.org; ljb@nei.org; dlochbaum@ucsusa.org; scott@pogo.org; loulsc@whistleblower.org; buntingk@missouri.edu; tslocum@citizen.org; jim.riccio@greenpeace.org
CC: matt.buckham@demint.senate.gov; matt.rimkunas@lgraham.senate.gov; matthew.rimkunas@graham.senate.gov; valerie.manak@epw.senate.gov; nathan.mccray@epw.senate.gov; dave.smith@carper.senate.gov; marty.gelfand@mail.house.gov; vic.edgerton@mail.house.gov; michal.freedhoff@mail.house.gov; komaki.foster@mail.house.gov; sc03dcintern1@mail.house.gov; jacob.zimmerman@nrc.gov; richard.correia@nrc.gov; doug.coe@nrc.gov; benjamin.beasley@nrc.gov; rudolph.bernhard@nrc.gov; fernando.ferrante@nrc.gov; john.hanna@nrc.gov; joseph.kanney@nrc.gov; laura.kozak@nrc.gov; david.loveless@nrc.gov; don.marksberry@nrc.gov; jeffrey.mitman@nrc.gov; dave.passehl@nrc.gov; wayne.schmidt@nrc.gov; stephen.vaughn@nrc.gov; jeffery.wood@nrc.gov; antonios.zoulis@nrc.gov; melanie.galloway@nrc.gov; joseph.gilitter@nrc.gov; eric.leeds@nrc.gov;

george.wilson@nrc.gov; richard.perkins@nrc.gov; michelle.bensi@nrc.gov; jacob.philip@nrc.gov;
selim.sancaktar@nrc.gov; geoffrey.ottenberg@nrc.gov; kevin.ellis@nrc.gov; gary.demoss@nrc.gov; kevin.coyne@nrc.gov
Subject: NRC Ignoring Perceived Security Concerns Regarding Jocassee Dam?
Date: Tue, 16 Oct 2012 01:30:40 -0400

Please see the attached document.

I do not know whether or not there is an actual security concern regarding Jocassee Dam. What I do know is that, if there is, the NRC is not ensuring Oconee Nuclear Station is adequately protected from such a concern.

If there is a credible security threat to Jocassee Dam, then the three reactors at the Oconee Nuclear Station need to be shutdown as long as the volume of water impounded by Jocassee and Keowee Dams is sufficient to overcome the flood barriers at Oconee's Standby Shutdown Facility. If there is not a credible security threat to Jocassee Dam, then the NRC needs to quit withholding from the public under the guise of "Security-Related Information" all its correspondence, memos and studies concerning safety liabilities from a failure of Jocassee Dam due to natural phenomena or latent engineering/construction flaws.

Either there is a security concern or there is not. If there is not, then the NRC needs to quit stamping everything regarding Jocassee Dam "Security-Related". If there is, then the NRC needs to either ensure Jocassee Dam is guarded to the same Design Basis Threat that ONS is guarded to or ensure the reactors at ONS are shutdown whenever the volume of water impounded in Lake Jocassee is great enough to jeopardize those reactors. Merely withholding from the public the specifics of the safety liability which the water impounded in Lake Jocassee poses to the reactors at ONS is not an adequate method for addressing a bonafide security concern.

Monday, October 15, 2012

(b)(6)

Senator Joseph Lieberman, Chairman
U.S. Senate Committee on Homeland Security & Governmental Affairs
706 Hart Office Building
Washington, DC 20510

Dear Senator Lieberman:

On September 18, 2012 I sent a letter to the Chairman of the US Nuclear Regulatory Commission concerning the NRC's handling of a safety concern regarding Jocassee Dam and the Oconee Nuclear Station. I copied the letter to a member of your Homeland Security & Governmental Affairs Committee staff as well as to the majority and minority staffs of other Senate and House committees who I believed might be interested.

It has been nearly four weeks since I sent my letter and have not heard from either the NRC Chairman's office or the NRC Office of the Inspector General. The only official communication I have received from the NRC was my branch chief informing me that he was directed to fill out a Form 183 for me failing to stamp my 2012-09-18 letter as "Official Use Only - Security-Related Information".

I am reaching out to your committee because I have several concerns which I believe the NRC is incapable of addressing.

For over 18 years the NRC has been aware that the flood wall surrounding the Standby Shutdown Facility at Oconee Nuclear Station is too short to protect the SSF from a failure of Jocassee Dam.¹

Beginning in 2006² (and possibly earlier) staff personnel at the NRC recognized that a failure of Jocassee Dam could result in a nuclear accident at Oconee station.

Although I have seen no documents indicating that there is a security concern associated with the failure of Jocassee Dam, since 2007 all NRC correspondence concerning Jocassee Dam has been stamped "Official Use Only - Safety-Related Information" so it is obvious to me that for at least the past five years the US NRC has believed there is a security concern associated with Jocassee Dam.

¹ Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/93-25, 50-270/93-25, and 50-287/93-25)," dated February 11, 1994

² Letter from Charles Casto, NRC, to Bruce H. Hamilton, Duke, "IR 05000269-06-016, IR 05000270-06-016, IR 05000287-06-016, on 03/31/2006, Oconee Nuclear Station - Preliminary White Finding," dated August 31, 2006

I do not work in nuclear security and I know little about it. It is my understanding that for the commercial nuclear industry the NRC has determined the maximum credible threat with which a nuclear plant might be challenged, and the NRC requires the commercial nuclear reactors which it regulates to adequately guard their plant against such a threat.

It stands to reason that if, as evident from the way the NRC is stamping information regarding Jocassee Dam, there is a credible threat to Jocassee Dam then, because of the danger a failure of Jocassee Dam poses to flooding of the Standby Shutdown Facility at the Oconee Nuclear Station, access to Jocassee Dam should be guarded against the same design basis threat to which the Oconee Nuclear Station and other reactor plants are guarded. I respectfully request that the Senate Committee on Homeland Security & Governmental Affairs verify that the NRC is ensuring access to Jocassee Dam is adequately guarded.

Aside from external terrorist attacks, commercial nuclear reactor plants are required to guard against internal sabotage. Personnel at commercial nuclear facilities are required to receive extensive background checks and, depending on their access to vital areas, are also required to undergo periodic reassessment including interviews with psychologists.

Due to the danger a failure of Jocassee Dam poses to the Oconee Nuclear Station, it stands to reason that the security, operations and maintenance personnel at the Jocassee Dam pumped storage station should be held to the same background checks and periodic reassessments as similar personnel at the Oconee Nuclear Station and other reactor plants. I respectfully request that the Senate Committee on Homeland Security & Governmental Affairs verify that the NRC is ensuring personnel with access to the pump storage plant at Jocassee Dam are adequately screened for insider threats.

As mentioned above, the US NRC decided 5 years ago (since at least 2007) that there is at least enough of a credible security threat to Jocassee Dam to justify withholding from the public all safety related concerns regarding the dam. Although five years is more than enough time to adequately guard Jocassee Dam, the NRC continues to stamp all safety concerns regarding the dam as "Official Use Only - Security-Related Information". This indicates to me that, after five years, the NRC has not been able to adequately ensure the security of Jocassee Dam. This is not surprising to me since the NRC does not regulate Jocassee Dam and therefore has no authority to dictate security measures required there.

As a pumped storage impoundment dam, Jocassee Dam is regulated by the Federal Energy Regulatory Commission (FERC). I know little about FERC, but it is my understanding that FERC does not require the facilities it regulates to be guarded against the same design basis threats that commercial nuclear reactors are guarded against. Although FERC's security requirements are likely adequate for most of the facilities it regulates, in the case of a pumped storage dam whose sabotage is assumed to result in a nuclear accident the only adequate course of action is to require a level of security capable of guarding against a threat equivalent to the design basis threat assumed for commercial nuclear facilities.

Similarly for internal sabotage, FERC's regulations should require that the background checks and periodic reassessments conducted at the Lake Jocassee Dam pumped storage station are equivalent to those conducted at commercial nuclear facilities.

However, I am not sure it is reasonable to expect FERC to be able to treat the Lake Jocassee Dam differently from the other facilities it regulates. FERC might not have the expertise, budget or staffing levels to (1) write the regulations for the Lake Jocassee guard force, (2) periodically inspect the guard force including "Force on Force" exercises, (3) write the regulations for the background checks and periodic reassessments, (4) ensure the background checks were done adequately, and (5) inspect and regulate the periodic reassessment program of the plant personnel including psychological evaluations.

It is apparent to me that during the past five years the NRC has been unable to coordinate with FERC to ensure that the perceived security vulnerability regarding Jocassee Dam has been addressed. Despite this, the three reactors at the Oconee Nuclear Station continue to operate.

In June 2010, the NRC issued Duke Energy a Confirmatory Action Letter (CAL) requiring Duke to upgrade the flood protections at the Oconee Nuclear Station such that by November 30, 2011 the flood barriers adequately protect the equipment at the Standby Shutdown Facility against a failure of Jocassee Dam. This deadline has since been moved to 2016. So for another three or four years Duke Energy is going to be allowed to operate the three reactors at its Oconee Nuclear Station with a perceived security liability unaddressed. This is unacceptable.

If there is truly a security liability posed by Jocassee Dam, Duke Energy can literally address it within hours. Lake Jocassee and Lake Keowee (the lake which Jocassee drains to) are pumped storage impounds. Within a matter of hours, Duke Energy can lower the volume of water impounded by the Lake Jocassee and Lake Keowee Dams such that in the event of a failure of the Jocassee Dam the remaining volume of water impounded will not overtop the inadequately sized flood fall surrounding the Standby Shutdown Facility at the Oconee Nuclear Station.

There is also another solution to the security concern: shut down the three reactors at the Oconee Nuclear Station until the flooding defenses surrounding the Standby Shutdown Facility are adequately improved.

It is understandable that the NRC cannot address the perceived security vulnerabilities at Jocassee Dam since it does not regulate Jocassee Dam. However, the NRC regulates the Oconee Nuclear Station and it is unconscionable that for five years the NRC has suspected a grave security concern and has not addressed it by requiring the three reactors at the Oconee Nuclear Station to be shutdown as long as the volume of water impounded in Lakes Jocassee and Keowee pose a security threat to those reactors. And it is equally unconscionable that the NRC is going to allow this condition to continue for an additional three or four years.

I am not convinced that there is a credible security concern regarding Jocassee Dam. Obviously, all manmade structures can be demolished. But that fact in and of itself does not cause a security threat to exist. For a security threat to exist, the minimum required threat to the structure needs to be less than the maximum credible threat. As mentioned above, the maximum credible threat to the Lake Jocassee Dam is – or should be – assumed to be equivalent to the design basis threat for Oconee Nuclear Station. But what is the minimum required threat to jeopardize the integrity of the dam? Is it a half dozen drunken teenage vandals with some stolen dynamite and a canoe? Or is it a platoon of trained underwater demolition experts from a technologically advanced nation-state?

I do not know enough about dam construction, terrorism or demolition to say what the minimum required threat to Jocassee Dam is. If it is less than (e.g. teenage vandals) or equal to (e.g. a well-armed squad of terrorists) the design basis threat for the Oconee Nuclear Station, then I agree with the NRC that there is a security concern with the Lake Jocassee Dam. If, however, it is greater than the design basis threat for the Oconee Nuclear Station (e.g. underwater demolition experts from the CIA, KGB, Mossad or MI6), then I do not believe there is a credible threat to Jocassee Dam.

I respectfully request the following from the Senate Committee on Homeland Security & Governmental Affairs:

1. Ensure that after five years of assuming there is a security threat to Jocassee Dam, the NRC has adequately assessed the minimum required threat capable of jeopardizing the integrity of the Lake Jocassee Dam.
2. If the minimum required threat capable of jeopardizing the integrity of the Lake Jocassee Dam is greater than the design basis threat for the Oconee Nuclear Station, then request the NRC to cease withholding from the public the correspondence, memos and studies concerning the safety liabilities which a failure of the Lake Jocassee Dam poses to the Oconee Nuclear Station.
3. If the minimum required threat capable of jeopardizing the integrity of the Lake Jocassee Dam is less than or equal to the design basis threat for the Oconee Nuclear Station, then request the NRC to ensure the three reactors at the Oconee Nuclear Station are in a shutdown condition whenever the combined volume of water impounded by the Jocassee and Keowee Dams is great enough to pose a flooding threat to the Oconee Nuclear Station in the event of a failure of Jocassee Dam.

Enclosed with this letter is a list of the correspondence, memos and studies concerning the safety liabilities posed by a failure of the Lake Jocassee Dam. Most of these documents have been stamped by the NRC as "Official Use Only – Security-Related Information" despite not containing any discussion of security concerns. It is my perception that the "security-related" concerns are merely assumed to exist; however it is possible that the NRC has done an actual assessment that shows there is a credible security threat to the dam. If this is the case, then it is unconscionable that in five years the NRC has not done anything to prevent the operation of the three reactors at ONS while an unaddressed vulnerability to their security remains outstanding.

Copied on this letter are several industry groups and government watchdog organizations. There are some within the Nuclear Regulatory Commission who will claim that it is irresponsible for me to share the information in this letter with members of the public. To them I would note that there is nothing in this letter - other than the list of documents enclosed - that is not already public knowledge. With regard to the list of documents enclosed, although these documents are stamped "Official Use Only - Security-Related Information", I do not believe that the mere mention of the existence of these documents constitutes the release of "Security-Related Information".

I have copied politically active organizations on this letter because I believe their participation is vital to the proper functioning of our democratic and republican processes. Although it might not be appropriate to release specific information to these organizations from documents stamped "Security-Related Information", merely informing them that after five years the NRC has failed to adequately address a perceived security threat from the Lake Jocassee Dam is certainly within my rights as a citizen and my duties as a licensed professional engineer.

Very respectfully,



Lawrence S. Criscione, PE

(b)(6)

Enclosure - 5 pages

Cc: Senator Susan Collins, Ranking Member, Homeland Security & Governmental Affairs
Senator Richard Durbin, Illinois
Congressman Pete King, Chairman, Homeland Security
Congressman Bennie Thompson, Ranking Member, Homeland Security
Congressman Fred Upton, Chairman, Energy & Commerce
Congressman Henry Waxman, Ranking Member, Energy & Commerce
Chairman Allison Macfarlane, US Nuclear Regulatory Commission
Special Counsel Carolyn Lerner, US Office of Special Counsel
Michael Corradini, American Nuclear Society
Admiral James Ellis, Institute of Nuclear Power Operations
Leslie Barbour, Nuclear Energy Institute
David Lochbaum, Union of Concerned Scientists
Scott Amey, Project on Government Oversight
Louis Clark, Government Accountability Project
Ken Bunting, National Freedom of Information Coalition
Tyson Slocum, Public Citizen Energy Program
Jim Riccio, Greenpeace

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
1994-FEB-11		Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/93-25, 50-270/93-25, and 50-287/93-25)," dated February 11, 1994
1994-MAR-14		Letter from J. W. Hampton, Duke, dated March 14, 1994
1994-OCT-6		Internal NRC memo documenting a meeting between Region II and NRR concerning a hypothetical Jocassee Dam failure.
1994-DEC-19		Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/94-31, 50-270/94-31, and 50-287/94-31)," dated December 19, 1994
2000-MAR-15		Letter from David E. LaBarge, NRC, to W. R. McCollum, Jr., "Oconee Nuclear Station, Units 1, 2, and 3 Re: Review of Individual Plant Examination of External Events (TAC Nos. M83649, M83650, and M83651)," dated March 15, 2000
2006-APR-28	<u>ML061180451</u>	OCONEE NUCLEAR STATION - INTEGRATED INSPECTION REPORT O5000269/2006002, O5000270/200602, O5000287/2006002
2006-AUG-31	<u>ML080780143</u>	IR 05000269-06-016, IR 05000270-06-016, IR 05000287-06-016, on 03/31/2006, Oconee Nuclear Station - Preliminary White Finding
2006-OCT-5	ML062890206	Oconee, Units 1, 2 & 3 - Response to Preliminary White Finding
2006-NOV-22	<u>ML063260282</u>	IR 05000269-06-017, IR 05000270-06-017, IR 05000287-06-017, Final Significance Determination for a White Finding and Notice of Violation, Duke Energy Carolinas, LLC
2006-DEC-20	ML063620092	Oconee, Units 1, 2, & 3, Appeal of Final Significance Determination for White Finding and Reply to Notice of Violation; EA-06-199
2007-JAN-29	ML070440345	Summary of Revised Fragility Evaluation Results for Jocassee Dam
2007-FEB-5		Letter from Bruce H. Hamilton, Duke, to NRC, "Seismic Fragility Study"
2007-FEB-22	ML070590329	Manual Chapter 0609.02 Appeal Panel Recommendations (Oconee Reply to a Notice of Violation and White Finding (EA-06-199))
2007-MAR-1	ML070610460	Oconee Appeal Panel Review of Manual Chapter 0609.02 Appeal Panel Review of Oconee Standby Shutdown Facility White Finding (EA-06-199)
2007-MAY-3	ML072970510	Oconee, Units 1, 2 and 3 - Request for NRC to Review Appeal of Final Significance Determination for SSF Flood Barrier White Finding
2007-JUN-22	ML071580259	Consideration of New Information Associated with a Final Significance Determination for a White Finding - Oconee NS
2007-JUN-28		Phone call between the NRC and Duke Energy
2007-OCT-1	ML072770765	10/01/2007, Slides with Notes for Final Regulatory Assessment of Oconee Flood Barrier Issue
2007-OCT-1	ML072770775	Dam Failure Information
2007-OCT-1	ML072770777	Questions and Answers Related to Oconee Flood Barrier
2007-NOV-20	ML073241045	Reconsideration of Final Significance Determination Associated with Standby Shutdown Oconee Facility Flood Barrier White Finding
2008-MAY-19	ML081350689	Briefing Package For Drop-In Visit By Duke Energy Chief Nuclear Officer With Chairman Klein And Commissioner Jaczko On May 21, 2008
2008-JUN-23	ML082390669	Proposal for a Risk Analysis of the Failure of the Jocassee and Keowee Dams to Assess the Potential Effects on the Safe Shut Down Facility of the Oconee Nuclear Station, South Carolina
2008-JUL-28	ML082120390	Oconee Nuclear Station - Revisions to the Selected Licensee Commitments Manual (SLC)

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2008-AUG-15	ML081640244	Information Request Pursuant to 10 CFR 50.54(F) Related to External Flooding, Including Failure of the Jocassee Dam at Oconee Nuclear Station, Units 1, 2, and 3 (TAC Nos. MD8224, MD8225, and MD8226)
2008-AUG-26	ML082390690	Kick Off for Risk Analysis of the Failure of the Jocassee and Keowee Dams to Assess the Potential Effects on the Safe Shutdown Facility at the Oconee Nuclear Station
2008-AUG-28	ML083300427	08/28/2008 - Summary of Closed Meeting to with Duke Energy Carolinas, LLC to Discuss the August 15, 2008, 50.54(f) Letter on External Flooding (TAC Nos. MD8224, MD8225, and MD8226)
2008-AUG-28	ML082550290	Meeting with Duke Energy Carolinas, Oconee Flood Protection and the Jocassee Dam Hazard
2008-SEP-6	ML082250166	Oconee Nuclear Station - Communication Plan for Information Request Related to Failure Frequencies for the Jocassee Pumped Storage Dam (Jocassee Dam) at the Oconee Nuclear Station and Potential Generic Implications
2008-SEP-26	ML082750106	Oconee, Units 1, 2 and 3 - Response to 10 CFR 50.54(f) Request
2008-NOV-5	ML091060761	11/05/08 Summary of Closed Meeting with Duke on External Flooding Issues, including failure of the Jocassee Dam, at Oconee Nuclear Station, Units 1, 2, and 3
2008-NOV-5	ML083390650	11/05/2008 Meeting Slides, "Oconee Site Flood Protection," NRC Meeting with Duke Energy Carolinas, LLC
2008-DEC-4	ML091420319	12/04/2008 Meeting Summary, Meeting to Discuss External Flooding at Oconee Nuclear Station (Reissuance, with Error on Page 3 Corrected)
2008-DEC-4	ML090480044	Oconee Nuclear Station, External Flood NRR Meeting, Rockville, MD, December 4, 2008
2009-FEB-3	ML090280474	Briefing Package for Commissioner Lyons Visit to Oconee on February 4, 2009
2009-APR-6	ML091170104	Oconee Nuclear Station, Units 1, 2 And 3 - Non-concurrence on Evaluation of Duke Energy Carolinas, LLC September 26, 2008, Response to Nuclear Regulatory Commission Letter Dated August 15, 2008 Related to External Flooding
2009-APR-9	ML091030172	Oconee External Flooding Briefing for Commissioner Jaczko
2009-APR-30	ML090570779	Oconee Nuclear Station Units 1, 2, and 3, Evaluation of Duke Energy Carolinas September 26, 2008, Response to External Flooding, Including Failure of the Jocassee Dam
2009-MAY-11	ML092940769	05/11/2009 Summary of Closed Meeting with Duke Energy Carolinas, LLC, to Discuss Preliminary Results of the Recent Inundation and Sensitivity Studies Concerning Failure of the Jocassee Dam and Resultant Flooding at Oconee Nuclear Station, 1, 2, and 3
2009-MAY-11	ML090820470	5/11/2009 Notice of Forthcoming Closed Meeting with Duke Energy Carolinas, LLC, to Discuss Sensitivity Studies Concerning Failure of the Jocassee Dam & Resultant Flooding at the Oconee Nuclear Station, Unit 1, 2, & 3
2009-MAY-11	ML091380424	Oconee Nuclear Station, Slides for Closing Meeting May 11, 2009 with Duke on the Oconee Flooding Issue
2009-MAY-20	ML091470265	Oconee, Units 1, 2 & 3, Request for Extension of Duke Response Time to Referenced Letter
2009-MAY-26	ML091480116	E-mail re Briefing Package for Visit to Jocassee Dam on June 23, 2009
2009-JUN-1	ML091590046	Oconee, Units 1, 2, and 3, Request to Withhold Sensitive Information in Presentation Materials Left with Staff
2009-JUN-10	ML091680195	Oconee, Units 1, 2, and 3 - Interim 30-Day Response to Reference 2.

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2009-JUN-11	ML091620669	6/11/09 Summary of Closed Meeting with Duke Carolina to Discuss External Flooding at Oconee
2009-JUN-25	ML091760072	NRC Site Visit to the Oconee Nuclear Station on June 15, 2009
2009-JUL-9	ML092020480	Oconee, Units 1, 2, & 3, Final 60-Day Response to Reference 2
2009-JUL-28	ML092230608	Oconee, Submittal of Selected Licensee Commitments Manual SLC Revision
2009-AUG-12	ML090570117	Oconee Flood Protection and the Jocassee Dam Hazard Basis for NRC Allowing Continued Operation
2009-AUG-27	ML092380305	Oconee, Slides for Closed Meeting Regarding External Flood Technical Meeting On August 27, 2009
2009-SEP-25	ML092710344	Site Visit Observation on 09/25/2009 by Joel Munday for Oconee
2009-OCT-28	ML093080034	10/28/09 Slides for Oconee Nuclear Station, Units 1, 2, and 3 - Meeting Slides - External Flood NRC Technical Meeting
2009-NOV-30	ML093380701	Oconee Nuclear Station, Units 1, 2, and 3, Oconee External Flood Analyses and Associated Corrective Action Plan
2009-DEC-4	ML090680737	12/04/09 Summary of Closed Meeting to Discuss the Duke Energy Carolinas, LLC., 09/26/08 Response to NRC's August 15, 2008 50.54(f) Letter on External Flooding at Oconee
2010-JAN-6	ML100280954	01/06/2010 Briefing to the Executive Team on the Oconee Nuclear Station External Flooding Issue
2010-JAN-11	ML100150066	Request Additional Information Regarding the Oconee External Flooding Issue
2010-JAN-15	ML100210199	Oconee, Units 1, 2 and 3 - Additional Information Regarding Postulated External Flood Threat Issues
2010-JAN-29	ML100271591	Evaluation of Duke Energy Carolina, LLC (Duke), November 30, 2009, Response to Nuclear Regulatory Commission (NRC) Letter Dated April 30, 2009, Related to External Flooding At Oconee Nuclear Station, Units 1, 2, And 3 (Oconee)
2010-FEB-8	ML100470053	Oconee, Units 1, 2, & 3, External Flood, Response to Request for Additional Information
2010-FEB-26	ML100610674	Oconee, Units 1, 2, & 3, External Flood Revised Commitment Letter
2010-MAR-5	ML103430047	Oconee Nuclear Station, Units 1, 2, & 3, Letter From Duke Energy Carolinas, LLC Regarding External Flood, Response to Request For Additional Information
2010-MAR-15	ML100780084	Generic Failure Rate Evaluation for Jocassee Dam Risk Analysis
2010-MAR-18	ML100810388	Prepare Briefing Book and Material for Eric Leeds for the Duke Fleet Meeting on March 18, 2010
2010-APR-14	ML100760109	Generic Failure Rate Evaluation for Jocassee Dam
2010-MAY-27	ML101600468	Oconee, Units 1, 2 & 3, Response to Requested Information on the Protection Against External Flooding Including a Postulated Failure of the Jocassee Dam
2010-JUN-1	ML101750619	OUO - Communication Plan For Issuance of Confirmatory Action Letter To Duke For Oconee - External Flooding June 2010
2010-JUN-3	ML101610083	Oconee Nuclear Station, Units 1, 2, and 3, - External Flood Commitments
2010-JUN-22	ML101730329	Oconee, Units 1, 2 & 3, Confirmatory Action Letter (CAL 2-10-003), Commitments to Address External Flooding Concerns
2010-JUN-29	ML101890803	06/29/2010 Summary of Closed Meeting With Duke Energy Carolinas, LLC, to Discuss External Flooding at Oconee
2010-JUL-7	ML101880768	OUO - IR 05000269-10-002, 05000270-10-006, 05000287-10-006; 01/01/2010 - 03/31/2010; Oconee Nuclear Station Units 1, 2 and 3; Interim Compensatory Measures for External Flood
2010-JUL-19	ML101900305	Identification of a Generic External Flooding Issue Due to Potential Dam Failures

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2010-AUG-2	ML102170006	Oconee Units 1, 2, & 3, Response to Confirmatory Action Letter (CAL) 2-10-003
2010-OCT-20	ML102910480	NRC Assessment of Oconee External Flooding Issue (October 18, 2010)
2010-OCT-26	ML102990064	NRC Staff Assessment of Duke Energy Carolinas, LLC, Oconee External Flooding Issue (TAC NOS. ME4441, ME4442, and ME4443)
2010-NOV-29	ML103490330	Oconee Nuclear Site, Units 1, 2, and 3, Oconee Response to Confirmatory Action Letter (CAL) 2-10-003
2011-JAN-5	ML110180609	Enclosure 1, Oconee Nuclear Station, Major Project Plans
2011-JAN-10	ML110260443	Non-concurrence on Oconee Assessment Letter
2011-JAN-28	ML110280153	Staff Assessment of Duke's Response to Confirmatory Action Letter Regarding Duke's Commitments To Address External Flooding Concerns At The Oconee Nuclear Station, Units 1, 2, And 3 (ONS) (TAC NOS. ME3065, ME3066, and ME3067)
2011-MAR-5	ML103410042	Supplement to Technical Basis for Allowing Oconee Nuclear Station to Remain in Operation Through November 2011, Associated with the External Flooding Issues
2011-MAR-15	ML110740482	Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures
2011-APR-29	ML111460063	Oconee Nuclear Site, Units 1, 2, and 3, Response to Confirmatory Action Letter (CAL) 2-10-003
2011-AUG-16	ML11229A710	E-mail re Briefing Package for Visit to Oconee Nuclear Power Plant on September 12-13, 2011
2011-AUG-18	ML11174A138	Oconee Nuclear Station, Units 1, 2, and 3, Assessment of Duke Energy Carolinas, LLC April 29, 2011, Response to Confirmatory Action Letter Regarding Modifications to Address External Flooding Concerns (TAC Nos. ME6133, ME6134, and ME6135)
2011-AUG-31	ML112430114	Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures
2011-SEP-1	ML11244A024	Briefing Package for Visit to Oconee Nuclear Power Plant on September 12-13, 2011
2011-OCT-3	ML11278A173	Oconee Nuclear Station (ONS), Units 1, 2, and 3, Response to Requests for Additional Information Regarding Necessary Modifications to Enhance the Capability of the ONS Site to Withstand the Postulated Failure of the Jocassee Dam
2011-OCT-17	ML11294A341	Oconee Nuclear Station (ONS), Units 1, 2, and 3, Response to Requests for Additional Information Regarding Necessary Modifications to Enhance the Capability of the ONS Site to Withstand the Postulated Failure of the Jocassee Dam
2011-DEC-16	ML113500495	Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures_redacted
2012-JAN-26	ML12026A549	Briefing Package for Commissioner Svinicki Visit to Oconee on February 1, 2012
2012-JAN-31	ML12026A254	Communication Plan for Oconee Nuclear Station (ONS) Following Issuance of GI-204
2012-FEB-3	ML12039A239	Oconee, Units 1, 2 and 3 - Request for Withholding from Public Disclosure Duke Energy Letter Dated May 20, 2009 Involving Postulated Failure of the Jocassee Dam
2012-FEB-9	ML12039A217	Briefing Package Request for Meeting with Duke Energy on February 16, 2012

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2012-FEB-17	ML12053A016	Duke Energy Carolinas, LLC - Recommended Revisions to the Oconee Nuclear Station Section of NRC's Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Plant Sites Following Upstream Dam Failure
2012-FEB-23	ML12058A236	02/23/12 Summary of a Teleconference between the US NRC and Duke Energy Regarding Comments made by Duke Energy Concerning the Issuance of the Screening Analysis Report for Generic Issue 204
2012-MAR-5	<u>ML090510269</u>	NRC Information Notice 2012-002 Potentially Nonconservative Screening Value For Dam Failure Frequency In Probabilistic Risk Assessments
2012-MAY-15	ML12129A186	Oconee Nuclear Station, Units 1, 2, and 3 - Request for Additional Information Regarding Modifications to Address the External Flooding Concerns (TAC NOS. ME7970, ME7971, AND ME7972)
2012-JUN-14	ML12167A372	Oconee, Units 1, 2, and 3, Response to Requests for Additional Information Regarding Modifications to Address External Flooding Concerns
2012-JUL-11	ML12215A327	07/11/2012 Licensee Non-Public Meeting Slides on Oconee External Flood Mitigation
2012-JUL-11	<u>ML12188A071</u>	Briefing Package for Meeting with Duke Energy on July 11, 2012
2012-AUG-7	<u>ML12206A325</u>	Briefing Book for Meeting with Duke Energy on August 7, 2012
2012-SEP-20	ML12268A404	Communication Plan for Flooding September 2012
2012-SEP-20	ML12219A163	Oconee Nuclear Station, Units 1, 2 and 3 - Response to Questions Regarding Modifications to Address External Flooding Hazards (TAC Nos. ME7970, ME7971, AND ME7972)

From: Perkins, Richard
Sent: Monday, November 05, 2012 5:44 PM
To: Criscione, Lawrence; Beasley, Benjamin; Lane, John; Kauffman, John; Salomon, Arthur; Wang, Zeechung; Cunanan, Arthur; Bensi, Michelle
Subject: For the branch...
Attachments: NRC All Hands Q and A.docx

In case you missed it, I took some notes during the Q&A at the all hands. Attached are my brief notes.

Richard H. Perkins, P.E.
Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Division of Risk Analysis
Operating Experience and Generic Issues Branch
Phone - 301/251-7479

Outside of Scope

What are 1 or 2 things you want to focus on next year. Siviniki – It's all important to me. Apostolakis – I'm worried about a hole in our regulation. Once we identify an issue, we tend to do well. What are we missing? McFarlane – Intersection of natural hazards and nuclear technology. Flooding. Geology. Back end of the fuel cycle. Communications.

Outside of Scope

From: Criscione, Lawrence
Sent: Monday, November 12, 2012 4:03 PM
To: Correia, Richard; Coe, Doug; Beasley, Benjamin
Subject: Letter to E&PW
Attachments: Draft - Lack of Transparency Impeding Resolution of Flooding Concerns at Oconee[1].pdf

Ben/Rich/Doug,

A couple weekends ago (Oct. 28th) I talked with John Sipos regarding the Jocassee/Oconee issue. John works in the New York Attorney General's office and is peripherally involved with nuclear power as the main attorney assigned to fight the Indian Point re-licensing. He recommended I write to the E&PW committee and speak with someone on their staff.

I started to write a letter to Senator Boxer on November 3rd, but did not get a chance to finish it until today. I've attached it to this email.

My chief concern is that NRR is not being completely forthright regarding the Jocassee/Oconee issue in its presentation to the Commission. Also, I believe that the NRC has not appropriately investigated whether or not there is a security concern regarding Jocassee Dam and whether or not it is appropriate to continue to withhold documents under the guise of "Security-Related Information".

I don't really need any action from you on the attached letter. I had committed to not contact with congressional staffers without first going through you, so I wanted to make you aware of the attached letter. I do not intend to send any references with this letter, OOU or otherwise.

You may forward the attached letter to OCA or anyone else whom you wish, but please be aware it is currently a draft and has not yet been sent to anyone.

V/r,
Larry

November 13, 2012

(b)(6)

Barbara Boxer, Chairman
US Senate Committee on the Environment & Public Works
410 Dirksen Senate Office Bldg.
Washington, DC 20510-6175

Dear Senator Boxer:

There are three reactors in Oconee County, South Carolina which face a risk of meltdown and containment failure that is highly similar to the accident which occurred in Japan in March 2011. The staff of the US Nuclear Regulatory Commission has known about these risks since 2007 but has yet to adequately address the issue. I am writing to you because the Commissioners of the NRC failed to bring up the three Oconee Nuclear Station reactors during their March 15, 2012 testimony at the US Senate Committee on the Environment & Public Works hearing and because it is unclear to me whether or not the Commissioners are fully aware of the vulnerabilities at Oconee.

The vulnerability posed to the reactors concerns a catastrophic failure of Jocassee Dam, which is upstream of the Oconee Nuclear Station. The NRC has known since 2006¹ that the flood wall at Oconee Nuclear Station is 7 to 12 feet too low to protect against the predicted flood height that would occur were Jocassee Dam to catastrophically fail. Like the reactors at Fukushima Dai-ichi, the reactors themselves at Oconee and their containment buildings are designed to survive earthquakes and flooding. However, their support systems – that is, the emergency standby equipment needed to safely shut them down and remove decay heat from their cores – are vulnerable to failure due to flooding which overtops their flood walls. The difference between Oconee and Fukushima is the source of the flood: a dam break instead of a tsunami. Aside from that difference, the predicted accidents are eerily similar in both their timing sequence and their probability of an unmitigated release of radioactivity to the surrounding countryside.

On September 18, 2012 I wrote a letter to NRC Chairman Macfarlane detailing my concerns regarding the vulnerability posed by Jocassee Dam to the Oconee reactors. Three days after sending my letter, I was informed by my branch chief that he was directed to fill out a NRC Form 183 on me for not adequately designating my letter as "Official Use Only – Security-Related Information". Four weeks after sending my letter I was informed by the Chairman's

¹ See pp. 5-9 of the "Oconee Nuclear Station Integrated Inspection Report 05000269/2006002, 05000270/200602, 05000287/2006002". This report is in the NRC's Agencywide Documents Access and Management System (ADAMS) under "Accession Number" [MLO61180451](#). Most of the documents I refer to in this letter are non-public and the most efficient way to request them from the NRC is to refer to the ADAMS Accession Number.

legal counsel that my letter had been referred to the NRC's Office of the Inspector General. Other than these two instances, I have not had any other discussions regarding my letter and am unsure if the Chairman or any of the other Commissioners have read my letter or are aware of the details of my concerns.

I have been directed by the NRC not to further distribute my 2012-09-18 letter because it is not properly designated. I have also been directed to no longer send NRC documents to Congressional staffers without going through my chain of command and the NRC's Office of Congressional Affairs. However, I did copy you on that 2012-09-18 letter, and Valerie Manak and Nathan McCray of the E&PW staff should have electronic copies of it.

Since becoming involved in the Jocassee/Oconee issue in 2007, the NRC's Office of Nuclear Reactor Regulation (NRR) has designated all internal and external correspondence regarding this issue as "Official Use Only – Security-Related Information". This designation not only prohibits the American public from knowing about the grave risks which Jocassee Dam poses to the reactors at Oconee, but, as I will explain below, this designation has also inhibited internal discussion of these concerns within the NRC.

In a September 26, 2008 letter to the US Nuclear Regulatory Commission (ML082750106), Duke Energy provided a harrowing timeline of what would occur at the Oconee Nuclear Station (ONS) were Jocassee Dam to catastrophically fail. Despite the fact that this time line appears in a Wikipedia article on Oconee Nuclear Station, since the NRC considers the Duke Energy letter to be "Official Use Only – Security-Related Information" I cannot quote the letter here. But the scenario provided in the 2008-09-26 Duke Energy letter is essentially the scenario that occurred at Fukushima Dai-ichi except, instead of a tsunami being the source of water overtopping the known inadequately sized flood wall, the source of water at ONS is a flood resulting from the failure of Jocassee Dam.

Prior to the 2011-03-11 tsunami, it was believed that the annual probability of a 45 foot tall tsunami reaching Fukushima Dai-ichi was on the order of once in every 100,000 years. It is now widely held that the annual probability is more likely around once in every 1,000 years.

In the 1980's it was believed the annual probability of Jocassee Dam failing was on the order of one chance in 100,000.² However, by 2007 the US NRC believed the actual number was more on the order of one chance in 10,000.³

When the five Commissioners testified before your committee on March 15, 2012, members of the staff at the US NRC believed that the three reactors at the Oconee Nuclear Station faced a risk eerily similar to what occurred at Fukushima Dai-ichi. Yet none of the Commissioners mentioned that fact when Senator Barrasso brought up the Union of Concerned Scientists'

² 1.3E-5/year was the failure frequency Duke Energy used in some of its risk assessments.

³ 2.9E-4/year is the failure rate the NRC has calculated for large rock-filled dams similar to Jocassee.

report on the vulnerability of US plants to Fukushima type disasters. Were the Commissioners withholding information from your committee? I don't believe so. I think what actually has happened is that crucial information has been withheld from them. They cannot testify before Congress about vulnerabilities of which they themselves have not been made fully aware.

To me, the most important tool the public has for ensuring good regulation and safety is accurate information. In a democratic republic such as ours, openness and transparency are essential in providing our citizens and their elected officials with the accurate information they need to make informed decisions.

To my knowledge, concerns that the flood wall at the Oconee Nuclear Station was too small first surfaced internally at Duke Energy in late 1993 and first made it to the NRC's attention in February 1994. The NRC dismissed the concerns in September 1994 as "not credible" because of an inappropriately low assumption regarding the failure rate of Jocassee Dam.

The issue regarding the inadequately sized flood wall resurfaced in March 2006. While attempting to defend a violation he had written against Duke Energy for inadequately controlling a two year breach in the flood wall ([ML061180451](#)), one of the NRC Resident Inspectors at Oconee Nuclear Station began researching the regulatory requirements for the flood wall.

In 2007 NRR's Division of Risk Assessment (NRR/DRA) determined that the annual failure probability of dams similar in construction to Jocassee is around $2.5E-4$ /year, which equates to a chance of once in every 4000 years ([ML100780084](#)).⁴ These might seem like good odds, but, given that a catastrophic failure of Jocassee Dam will lead to a Fukushima scenario in South Carolina, these odds make the risk of a significant accident and radiation release at Oconee Station about 100 times greater than the risks associated with a typical US commercial nuclear reactor.

In 2008 the NRC sent Duke Energy a 10CFR50.54(f) request ([ML081640244](#)) to obtain the necessary information to adequately determine if the risks posed to Oconee Nuclear Station by Jocassee Dam were acceptable. A 10CFR50.54(f) request is a rare occurrence and it undoubtedly got the attention of the Commissioners. However, because by this time the NRC was stamping all documents concerning Jocassee Dam as "Official Use Only – Security-Related Information" (OUO-SRI), it did not get the attention of the public.

My primary reason for bringing the Jocassee/Oconee issue to your attention is because, to me, it is an example of how lack of discipline regarding transparency has allowed a significant issue to go uncorrected for over six years and counting, with the current deadline for resolution still four years away. I believe that NRR's stamping of all documents concerning Jocassee Dam as

⁴ [ML100780084](#) is dated 2010-03-15. This is the formalized version of research and calculations performed in 2007 by Ferrante and Mitman of NRR/DRA.

"OUO-SRI" has not only prevented the public scrutiny necessary for our democratic and republican institutions to properly function, but has also inhibited the internal flow of information within the NRC and thereby has been detrimental to both public safety and security.

Duke Energy's response to the NRC's 10CFR50.54(f) request was, like the original request, withheld from the public under the guise of security. This response is the document which contains the Fukushima-style timeline regarding what would occur to the three reactors at Oconee were Jocassee Dam to catastrophically fail.⁵ It is unclear to me whether or not any of the Commissioners reviewed this document. It is ludicrous to expect the Commissioners to review every piece of correspondence received by the NRC – they have a staff of over 4,000 federal employees to assist with that. But I would assume that all important issues make it to their attention during their periodic briefings. However, based on the documents I have reviewed, I question the exact level of detail which they have received regarding the Jocassee/Oconee issue during their briefings from NRR.

On February 3, 2009 Commissioner Peter Lyons traveled to South Carolina to tour Jocassee Dam and Oconee Nuclear Station. In the briefing book prepared from him by NRR (ML090280474) there is a 25-line summary detailing the flooding issues. The 2008-08-15 10CFR50.54(f) request is mentioned in this summary. However, what did not make it into this summary is NRR/DRA's estimate that the failure rate of Jocassee Dam is about 2.5E-4/year and that in their 2008-09-26 response to the 20CFR50.54(f) request Duke Energy admitted that a catastrophic failure of Jocassee Dam would likely lead to the meltdown of all three reactor cores at the Oconee Nuclear Station and possibly the failure of the containment structures.

On February 20, 2009 two engineers from NRR's Division of Risk Assessment, Fernando Ferrante and Jeffrey Mitman, began routing an Information Notice (IN 2012-02) concerning the risks posed to some nuclear reactor sites due to dam failures. The purpose of this information notice (ML090510269) was:

... to alert addressees of a potentially nonconservative screening value for dam failure frequency that originated in 1980's reference documents which may have been referenced by licensees in their probabilistic risk assessment (PRA) for external events. Using a nonconservative screening value for dam failure frequency to evaluate the need for an additional detailed analysis may result in underestimating the risks to the plant associated with external flooding or loss of heat sink from the failure of upstream and

⁵ I cannot quote from Duke Energy's 2008-09-26 letter without the NRC claiming that this letter to you is now "Official Use Only – Security-Related Information" which must only be provided through their Office of Congressional Affairs (NRC/OCA). I respectfully suggest that your staff request ML082750106 and ML112430114 from NRC/OCA. The Fukushima-style timeline appears on p. 10 of attachment 2 of ML082750106 and on pp. 8-9 of ML112430114. It is also quoted on the fourth page of my 2012-09-18 letter to NRC Chairman Macfarlane.

downstream dams or levees. The NRC expects that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems.

Please note that this Information Notice was being routed more than two years prior to Fukushima occurring. That is, two years prior to the 2011-03-11 flooding-induced triple reactor accident at Fukushima, the NRC was aware that certain US plants might face a similar scenario were dams upstream of them to fail. However, this information notice was not released until more than three years later (March 5, 2012 which was nearly a year after Fukushima). The reason this information notice took more than three years to route was because of the controversial nature of NRR's indecisiveness regarding how to address the flooding vulnerabilities at Oconee and also because of the debate over whether dam break effects on nuclear reactors is a security concern which needs to be withheld from the American public.

In the past year, I have encountered many people, both within the NRC and external, who are adamant that the vulnerability which a failure of Jocassee Dam poses to Duke Energy is a security liability which must be kept from the public. Although I am sympathetic to the desire not to broadcast our security liabilities, I have no tolerance for using concerns over security as a pretext for withholding important safety vulnerabilities from the public. When the Jocassee/Oconee issue first came to light in an April 28, 2006 publicly available inspection report, the issue was not being withheld. At some point in 2007 the NRC, either at the request of Duke Energy or on their own accord, decided to begin withholding from the public all correspondence regarding the safety liability posed by a failure of Jocassee Dam.

Is Jocassee Dam a credible target for terrorists and/or saboteurs? I don't know. But it does make sense to me that, in 2007, the NRC might reasonably want to withhold information regarding Jocassee/Oconee while they determined whether or not a security vulnerability existed and whether or not security measures were required to be put into place to protect it. What does not make sense to me, however, is that in 2012 we are still withholding from the public information on a vital safety concern under the guise of "Security-Related Information". After five years, have we not addressed the security concerns?

It is unreasonable to me that a government agency is allowed to withhold a significant public safety concern from the public under the guise of security, yet then not, after 5 years, do any meaningful study of the issue to determine if, in fact, a security vulnerability does exist and what must be done to remove it. Is there a security concern or isn't there? If there is, why, after five years, has it not been addressed? If there is not, then why, after five years, are we still withholding vital information from the public under the guise of security?

In April 2009, NRR was in the process of responding to Duke Energy regarding resolution of the Jocassee/Oconee issue. As part of the routing of that response, NRR's Division of Risk Assessment was asked for their concurrence. The Deputy Director of NRR/DRA, Melanie Galloway, refused to initial her concurrence block and instead submitted a Non-Concurrence

form (ML09117010) on April 6, 2009. Like all documents regarding Jocassee/Oconee, Ms. Galloway's Non Concurrence form is stamped "OUO-SRI" and I cannot quote from it. But a deputy division director submitting a Non-Concurrence is rare; this is a process that is mainly used by lower level staff, and even for them it is rare. Had Ms. Galloway's Non-Concurrence form – which in no way concerns security vulnerabilities – been publicly available, it would have likely gained the attention necessary to get the Jocassee/Oconee issue resolved in a timely manner.

Had intervenor groups such as the Union of Concerned Scientists been given access to Melanie Galloway's Non-Concurrence form via publicly available ADAMS, then they would have likely been able to counter the pressure which Duke Energy was placing on NRR. With dozens of their own engineers, lawyers and hired contractors, Duke Energy was able to convince NRR that, in order for improvements to Oconee's flooding defenses to be required, the NRC needed to probabilistically show that Jocassee Dam placed an inordinate risk upon the three reactors at Oconee. Pressure from the Union of Concerned Scientists and other intervenor groups, however, would have likely convinced NRR that, per Duke Energy's operating license for the Oconee reactors, in order for Duke Energy to be allowed to continue to operate the three reactors at Oconee they needed to deterministically show that these reactors were adequately protected from a catastrophic failure of Jocassee Dam.

On April 9, 2009 Chairman Jaczko was briefed by NRR on the Jocassee/Oconee issue. I don't exactly know what was said at this briefing. The briefing slides (ML091030172) mention that new calculations concerning the failure frequency of Jocassee Dam suggest that core damage frequency (i.e. the annual probability that a meltdown will occur) for the reactors at Oconee might be non-conservative by an order of magnitude. What is not mention in the slides is Duke Energy's Fukushima-style scenario (contained in their 2008-09-26 letter) of what would occur at Oconee Nuclear Station were Jocassee Dam to catastrophically fail.

On January 6, 2010 the leadership of NRR met to discuss the Jocassee/Oconee issue (ML100280954). The purpose of the meeting was whether NRR should issue an order to Oconee requiring them to, in a timely manner, mitigate the risks posed by a failure of Jocassee Dam, or whether NRR should merely issue another 10CFR50.54(f) request for information and potentially follow up with an order later. The "Cons" listed for the "10CFR50.54(f) option" were that it was not as enforceable as an order and that it had a slower response time for resolution of the external flooding issue. The "Cons" listed for the "order option" were that there was the potential for a public hearing and that an order required signature authority. In other words, to go the route of an order, the Commission and the public would need to be made aware of the risks which Jocassee Dam posed to Oconee. Despite the slower response time, NRR opted to go the route of the 10CFR50.54(f) letter and avoid the Commission and public scrutiny an order would entail.

In February 2010 – using information provided by Ferrante and Mitman of NRR/DRA – George Wilson submitted an informal memorandum to the NRC's Office of Nuclear Regulatory

Research (RES) requesting that a Generic Issue be assigned to investigate whether external flooding concerns, similar to those posed by Jocassee Dam to the three reactors at Oconee, existed elsewhere in our nation's fleet of 104 commercial reactor plants. George Wilson was the Dam Safety Officer in NRR's Division of Engineering (NRR/DE). At the time, we (i.e. RES/DRA/OEGIB) deemed Mr. Wilson's February 2010 memo to be too speculative and inflammatory to make it an official agency record; however, I have a copy of it if your committee staff requires it. This memo is an example of just how serious mid-level staffers in the various divisions of NRR viewed the Jocassee/Oconee issue. Keep in mind, this is over a year prior to the Fukushima accidents, yet the staff within NRR were presciently predicting the nuclear catastrophe that could occur were an inadequately sized flood wall to be overtopped allowing the flooding of the standby shutdown equipment necessary to remove decay heat from the reactor cores and containment buildings. Unfortunately it does not appear the managers at NRR were providing the Commissioners all the details and bases of their staff's concerns.

On June 22, 2010 NRR issued a Confirmatory Action Letter to Duke Energy (ML101730329) requiring them to (1) by August 2, 2010 provide an estimate of the volume of water impounded by the Lake Jocassee Dam to be used for flood height analysis at Oconee Nuclear Station, (2) by November 30, 2010 provide a list of modifications to be made at Oconee to adequately protect the plant from flooding due to a failure of the Lake Jocassee Dam, and (3) by November 30, 2011 have the provided modifications in place.

On July 19, 2010, NRR sent a formal memo to RES requesting a Generic Issue on flooding of nuclear power plant sites following upstream dam failures (ML101900305). In August 2010, the Operating Experience and Generic Branch (RES/DRA/OEGIB) of the Division of Risk Assessment in the NRC's Office of Nuclear Regulatory Research began working on a screening analysis report for what would become GI-204 (Generic Issue 204). In my opinion, the 2010-07-19 memo and the attendant screening report are evidence of the NRC staff identifying a significant vulnerability and striving to get it addressed. Please note that this issue was being forwarded without the hindsight of the Fukushima accident and entirely due to the analysis of the NRR staff and their determination to pro-actively address an issue significant to the safety of about a fifth of our nation's nuclear reactor plants.

On August 2, 2010, Duke Energy provided the NRC with an estimated volume of water to be assumed impounded by the Lake Jocassee Dam. Their estimate was a "sunny day" estimate. For reasons not understood by myself and other staff engineers at the NRC, Duke Energy believes that a failure of Jocassee Dam during an inordinately heavy rainfall (such as the one experienced in Senator Sanders' state in 2011 as the remnants of Hurricane Irene blew over parts of Vermont and New York) is not a credible scenario. In January 2011, Jeff Mitman of NRR/DRA challenged this assumption through the Non-concurrence process (ML110260443).

On November 29, 2010, Duke Energy informed the NRC that it was giving itself an additional 6 months to provide the list of modifications needed to protect the three reactors at Oconee

from a failure of the Lake Jocassee Dam (ML103490330). Despite this issue being over four years old in its current incarnation (and over 16½ years old from its 1994 incarnation), NRR did not object to Duke's 6 month extension.

By March 10, 2011 (the eve of the earthquake and tsunami in Japan), RES/DRA/OEGIB had completed its screening analysis report for GI-204 and submitted it for routing. As you are well aware, on March 11, 2011 flooding induced from a tsunami disabled the emergency equipment at the Fukushima Dai-ichi reactors leading to the meltdowns of three reactor cores and the destruction of the buildings housing their containments. In the NRC's Office of Nuclear Regulatory Research, we assume that the accident in Japan would add a sense of urgency to the approval of GI-204 and the addressing of the flooding concerns at Oconee. Instead, it inordinately delayed both. I am in no position to completely understand what occurred, but from my second-hand vantage point it appears that the management at NRR viewed the true vulnerability exposed by Fukushima not to be the flooding issue at Oconee but rather their multi-year mismanagement of getting it addressed.

On April 29, 2011 Duke Energy provided the NRC the list of modifications it intended to do at Oconee to protect against a failure of Jocassee Dam (ML111460063). In this letter, Duke Energy extended the NRC's due date for implementation of the modifications from Nov. 30, 2012 to a nebulous commitment of 30 months after the approval of the modification plans by the NRC and FERC (the Federal Energy Regulatory Commission).

So, as of April 29, 2011 – seven weeks after the Fukushima accidents – the NRC's deadline for adequately protecting the Oconee reactors from a failure of Jocassee Dam had slid from November 30, 2011 to some indefinite time in roughly mid-2014.

As noted many times to your committee, the NRC has issued orders to all 104 reactor plants to make modifications based on the lessons learned from the Fukushima accident. What has likely not been noted to your committee is that the NRC has allowed Duke Energy to slide their mid-2014 due date for protecting Oconee from a Jocassee Dam failure to 2016 in order to conform with the Fukushima deadlines given to the other US reactor plants. But the three reactors at Oconee are different from the rest of the US fleet. Unlike the other 101 reactors, the three reactors at Oconee had a known external flooding concern that, over nine months prior to the Fukushima accident event occurring, had a November 30, 2011 deadline set (i.e. the 2011-11-30 deadline was established in a 2010-06-22 letter which was delivered to Duke Energy nearly 9 months prior to the 2011-03-11 tsunami occurring). The 2016 deadline is reasonable for the other 101 reactors because this was a new issue for them. But for the three reactors at Oconee, by the time the post-Fukushima orders came out they were already 5 years into the external flooding issue and had a deadline for modifications already set. Does it make sense that their already generous deadline be extended to match everyone else's?

The history I've provided you is little known within the NRC. Because of supposed security concerns, the Jocassee/Oconee issues are not discussed at All Hands Meetings. The issues are

not discussed in sessions at the NRC's annual Regulatory Information Conference (RIC). The issues do not appear in articles of Platts, or at American Nuclear Society conferences, or in online nuclear discussion groups, or in Union of Concerned Scientists blogs. Because of the OOU-SRI designation of all correspondence regarding this issue, there is virtually no internal oversight within the NRC to make sure NRR is properly handling this issue. And because of the OOU-SRI designations there was a strong push by NRR to force RES to remove all OOU-SRI material from the screening report for GI-204.

Like briefing packages for the Commissioners, Generic Issue screening reports are typically released to the public as part of the NRC's commitment to transparency. But it must be remembered that these reports are not written for public consumption – they are written for internal use. Briefing packages to the Commissioners are written to concisely inform the Commissioners of important points on key issues. Generic Issue screening reports are written to inform the screening panel members of the issues. Being that the Commissioners and the NRC staff are all authorized to view OOU-SRI documents, why would we water down our internal reports by removing all OOU-SRI material and thereby share less information with ourselves? I do not know the answer to that, but I have a suspicion.

When NRR knows a document – such as a Generic Issue screening report or a Commissioner briefing package – is going to eventually be released to the public, they prefer it be released without redactions. Redactions are a “red flag” for intervener groups like Greenpeace and the Union of Concerned Scientists. If the Fukushima-style timeline from Duke Energy's 2008-09-26 letter were to appear in a briefing book for Commissioner Apostolakis' trip to Oconee, then NRR knows that, when that briefing book is eventually released with a paragraph from the “External Flooding” section redacted, David Lochbaum will be asking his connections on Capitol Hill to request the redacted section. To avoid this, NRR essentially “pre-redacts” it by not even including it in the first place. Unfortunately, in doing this they keep the Commissioners from obtaining vital information that the Commission needs to know to make important decisions.

And likewise for the screening panel for Generic Issue 204. Richard Perkins, the lead author of the *“Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures”* (ML112430114), was under constant pressure from NRR to remove the 2008-09-26 Duke Energy timeline from his report (he has a foot tall stack of internal NRC email correspondence to document it). Richard Perkins came to the NRC from the Department of Energy where he worked on the annual certification process for assuring the safety and reliability of America's nuclear weapons. He's a graduate of the National War College and was used to working with Top Secret and Special Compartmentalized Information (TS-SCI) on a daily basis. To him, the notion that the screening panel for GI-204 did not have a “need to know” the accident timeline from Duke Energy's 2008-09-26 letter was absolutely ludicrous. He's rhetorically asked me on many occasions, “Why would we want to redact this information from our internal report?”

On September 14, 2012 Richard Perkins submitted a letter to the NRC's Inspector General alleging that the NRC had "*intentionally mischaracterized relevant and noteworthy safety information as sensitive, security information in an effort to conceal the information from the public.*" I assume the NRC's Office of the Inspector General (OIG) is investigating his complaint but am unaware of their findings. Given the NRC OIG's proclivity for narrowly focusing on procedural processes and not questioning the broader intent of those processes, I am doubtful that the OIG investigation will be conducted with a broad enough questioning attitude to adequately investigate Mr. Perkins' claims.

On September 12 & 13, 2011, Commissioner Apostolakis visited Jocassee Dam. In the NRR prepared briefing book for that visit (ML11244A024), the 25 line description of the External Flood section provided to Commissioner Lyons had shrunk to 9 lines. Although Commissioner Apostolakis' visit was a mere six months after Fukushima, no mention of Duke Energy's Fukushima-style timeline from their 2008-09-26 letter was made in the briefing book. Nor was there any mention of the failure probability of Jocassee Dam being in the same range as the probability of a 45 foot tsunami hitting the Fukushima Dai-ichi site.

On February 1, 2012 Commissioner Svinicki visited Jocassee Dam. NRR's briefing book for that visit (ML12026A549) contains a whole page on the External Flooding issue, yet does not mention the facts that (1) the issue has gone on for six years, (2) the Duke Energy accident timeline is very similar to Fukushima, (3) the flooding probability is similar to Fukushima, (4) NRR had assigned Duke Energy a 2011-11-30 deadline nine months prior to Fukushima, (5) seven weeks after Fukushima that 2011-11-30 deadline was extended by Duke Energy to mid-2014, and (6) the deadline for Duke Energy's propose modifications to their flooding defenses was later moved to 2016 to match the Fukushima action plan for all the plants without known flooding hazards. These are things that, were I Commissioner Svinicki, I would like to know before visiting Oconee – and, for that matter, before testifying before your committee on March 15, 2012.

On February 16, 2012 Duke Energy came to NRC headquarters for a "Drop-in Visit" with Bill Borchardt, the NRC's Executive Director for Operations (EDO). NRR's briefing book for that visit (ML12039A217) contains a page on the External Flooding issue which is similar to the one provided to Commissioner Svinicki. I do not know if Mr. Borchardt is aware of the true risk that Jocassee Dam poses to the three reactors at Oconee, but if all he knows is the summary in his briefing book, then there is much which he is unaware of yet needs to know.

On March 15 all five Commissioners testified before your committee at the Hearing on Post-Fukushima U.S. Reactor Safety. None of the Commissioners mentioned the fact that three reactors in Oconee County, South Carolina face a similar risk as was faced by the reactors at Fukushima Dai-ichi on March 11, 2011. I believe they did not mention it to your committee because it has been kept from them themselves.

On July 11, 2012 Duke Energy again visited Mr. Borchardt for a "Drop-in Visit" and on August 7, 2012 they dropped in on the Commissioners. As before, the briefing books supplied for these visits (ML12188A071 & ML12206A325) did not mention the true risks posed by Jocassee Dam or the delays in resolving these risks.

If you believe the issues I have brought forward in this letter are of interest to your committee, then I respectfully suggest your staff seek answers to the following:

1. What is the official NRC determination as to the best estimate of the annual failure frequency of Jocassee Dam? How does this failure frequency compare to the annual frequency of a tsunami similar to the one in Japan on 2011-03-11 which caused the flooding induced nuclear accident at Fukushima Dai-ichi?
2. What is the official NRC position regarding whether or not a catastrophic failure of Jocassee Dam is a credible risk for which Duke Energy must deterministically show that the three reactors at Oconee Nuclear Station are adequately protected?
3. What is the official NRC position regarding whether or not the current flooding defenses at Oconee are adequate and what, if any, improvements need to be made?
4. What is the official NRC position regarding the most likely accident sequence at Oconee Nuclear Station were Jocassee Dam were to catastrophically fail? How does this accident sequence compare to the March 2011 accident at Fukushima?
5. Assuming the catastrophic failure of Jocassee Dam, what is the NRC's best estimate of the likelihood that the operators at Oconee Nuclear Station would be able to restore cooling to the reactors prior to the containment buildings failing? What are the differences between the Oconee reactors and the Fukushima reactors that leads the NRC to believe the Oconee operators will be able to successfully restore cooling prior to containment failures? Has the NRC conducted any formal studies to estimate the success rate of Duke Energy's mitigation strategies to prevent containment failures in the event of a catastrophic failure of Jocassee Dam? If so, when were these studies conducted and what were the results?
6. Has the US NRC or any federal agency conducted an assessment to determine if Jocassee Dam is adequately protected from terrorist threats? If so, what were the results of the assessments? Is access to Jocassee Dam adequately guarded from terrorist attack? Are the employees at the Jocassee Hydro-Electric Facility screened for inside saboteurs to the same level at which nuclear workers at the Oconee reactors are screened? Is it necessary to continue to withhold from the public vital safety information concerning the risks which a failure of Jocassee Dam poses to the three reactors at the Oconee Nuclear Station?
7. Do the Commissioners believe that, prior to their March 15, 2012 testimony before the US Senate Committee on the Environment & Public Works, they were adequately informed of the vulnerability which Jocassee Dam poses to the reactors at the Oconee Nuclear Station?
8. When does the US NRC intend to release to the public their correspondence concerning Jocassee Dam and Oconee Nuclear Station? What is the justification for continuing to

withhold this information from the American public and from public intervener groups such as the Union of Concerned Scientists? Does the NRC believe it would benefit from a review of its handling of the Jocassee/Oconee issue conducted by intervener groups?

Enclosed with this letter is a list of NRC correspondence, memos and studies regarding the Jocassee/Oconee issue. As can be seen from the enclosed list, this issue has festered in its current incarnation since 2006 and was originally brought forward to the NRC in 1994. Please note that most of the documents on the enclosed list are being withheld from the American public.

Although I am convinced the risks of a nuclear accident at Oconee are at least an order of magnitude greater than at a typical US reactor plant, I am not yet convinced that these risks are unacceptable. And although I do not know enough about nuclear security to judge whether or not all the security issues have been adequately addressed, at this time I do not believe a credible security threat to Jocassee Dam exists. I am not appealing to your committee with safety or security concerns. My concern is transparency, and how the lack of it has not only impeded this issue from getting the public scrutiny which it requires but may also be impeding this issue from getting the appropriate scrutiny from the Commissioners of the US Nuclear Regulatory Commission.

Very respectfully,

Lawrence S. Criscione, PE
Reliability & Risk Engineer
Operating Experience & Generic Issues Branch
Division of Risk Assessment
Office of Nuclear Regulatory Research
US Nuclear Regulatory Commission

(b)(6)

Enclosure

Cc: Senator James Inhofe, Ranking Member, Committee on Environment & Public Works
Senator Thomas Carper, Chairman, E&PW Subcommittee on Clean Air & Nuclear Safety
Senator John Barrasso, Ranking Member, E&PW Subcom. on Clean Air & Nuclear Safety
Senator Sheldon Whitehouse, Chairman, E&PW Subcommittee on Oversight
Senator Mike Johanns, Ranking Member, E&PW Subcommittee on Oversight
Chairman Allison Macfarlane, US Nuclear Regulatory Commission

From: McCray, Nathan (EPW) <Nathan_McCray@epw.senate.gov>
Sent: Wednesday, November 14, 2012 10:25 AM
To: Criscione, Lawrence
Subject: RE: Lack of Transparency Impeding Resolution of Flooding Concerns at Oconee

Thank you.

Nathan McCray
Majority Staff
U.S. Senate Committee on Environment and Public Works
410 Dirksen Senate Office Building
Washington, DC 20510
202-224-8832
202-224-1273 Fax

Follow EPW Majority:



From: Criscione, Lawrence [<mailto:Lawrence.Criscione@nrc.gov>]
Sent: Wednesday, November 14, 2012 10:15 AM
To: Manak, Valerie (EPW); McCray, Nathan (EPW)
Subject: Lack of Transparency Impeding Resolution of Flooding Concerns at Oconee

Please see the attached letter to the Senate Committee on the Environment & Public Works.

November 14, 2012

(b)(6)

Barbara Boxer, Chairman
US Senate Committee on the Environment & Public Works
410 Dirksen Senate Office Bldg.
Washington, DC 20510-6175

Dear Senator Boxer:

There are three reactors in Oconee County, South Carolina which face a risk of meltdown and containment failure that is highly similar to the accident which occurred in Japan in March 2011. The staff of the US Nuclear Regulatory Commission has known about these risks since 2007 but has yet to adequately address the issue. I am writing to you because the Commissioners of the NRC failed to bring up the three Oconee Nuclear Station reactors during their March 15, 2012 testimony at the US Senate Committee on the Environment & Public Works hearing and because it is unclear to me whether or not the Commissioners are fully aware of the vulnerabilities at Oconee.

The vulnerability posed to the reactors concerns a catastrophic failure of Jocassee Dam, which is upstream of the Oconee Nuclear Station. The NRC has known since 2006¹ that the flood wall at Oconee Nuclear Station is 7 to 12 feet too low to protect against the predicted flood height that would occur were Jocassee Dam to catastrophically fail. Like the reactors at Fukushima Dai-ichi, the reactors themselves at Oconee and their containment buildings are designed to survive earthquakes and flooding. However, their support systems – that is, the emergency standby equipment needed to safely shut them down and remove decay heat from their cores – are vulnerable to failure due to flooding which overtops their flood walls. The difference between Oconee and Fukushima is the source of the flood: a dam break instead of a tsunami. Aside from that difference, the predicted accidents are eerily similar in both their timing sequence and their probability of an unmitigated release of radioactivity to the surrounding countryside.

On September 18, 2012 I wrote a letter to NRC Chairman Macfarlane detailing my concerns regarding the vulnerability posed by Jocassee Dam to the Oconee reactors. Three days after sending my letter, I was informed by my branch chief that he was directed to fill out a NRC Form 183 on me for not adequately designating my letter as "Official Use Only – Security-Related Information". Four weeks after sending my letter I was informed by the Chairman's

¹ See pp. 5-9 of the "Oconee Nuclear Station Integrated Inspection Report 05000269/2006002; 05000270/2006002, 05000287/2006002". This report is in the NRC's Agencywide Documents Access and Management System (ADAMS) under "Accession Number" [ML061180451](#). Most of the documents I refer to in this letter are non-public and the most efficient way to request them from the NRC is to refer to the ADAMS Accession Number.

legal counsel that my letter had been referred to the NRC's Office of the Inspector General. Other than these two instances, I have not had any other discussions regarding my letter and am unsure if the Chairman or any of the other Commissioners have read my letter or are aware of the details of my concerns.

I have been directed by the NRC not to further distribute my 2012-09-18 letter because it is not properly designated. I have also been directed to no longer send NRC documents to Congressional staffers without going through my chain of command and the NRC's Office of Congressional Affairs. However, I did copy you on that 2012-09-18 letter, and Valerie Manak and Nathan McCray of the E&PW staff should have electronic copies of it.

Since becoming involved in the Jocassee/Oconee issue in 2007, the NRC's Office of Nuclear Reactor Regulation (NRR) has designated all internal and external correspondence regarding this issue as "Official Use Only – Security-Related Information". This designation not only prohibits the American public from knowing about the grave risks which Jocassee Dam poses to the reactors at Oconee, but, as I will explain below, this designation has also inhibited internal discussion of these concerns within the NRC.

In a September 26, 2008 letter to the US Nuclear Regulatory Commission (ML082750106), Duke Energy provided a harrowing timeline of what would occur at the Oconee Nuclear Station (ONS) were Jocassee Dam to catastrophically fail. Despite the fact that this time line appears in a Wikipedia article on Oconee Nuclear Station, since the NRC considers the Duke Energy letter to be "Official Use Only – Security-Related Information" I cannot quote the letter here. But the scenario provided in the 2008-09-26 Duke Energy letter is essentially the scenario that occurred at Fukushima Dai-ichi except, instead of a tsunami being the source of water overtopping the known inadequately sized flood wall, the source of water at ONS is a flood resulting from the failure of Jocassee Dam.

Prior to the 2011-03-11 tsunami, it was believed that the annual probability of a 45 foot tall tsunami reaching Fukushima Dai-ichi was on the order of once in every 100,000 years. It is now widely held that the annual probability is more likely around once in every 1,000 years.

In the 1980's it was believed the annual probability of Jocassee Dam failing was on the order of one chance in 100,000.² However, by 2007 the US NRC believed the actual number was more on the order of one chance in 10,000.³

When the five Commissioners testified before your committee on March 15, 2012, members of the staff at the US NRC believed that the three reactors at the Oconee Nuclear Station faced a risk eerily similar to what occurred at Fukushima Dai-ichi. Yet none of the Commissioners mentioned that fact when Senator Barrasso brought up the Union of Concerned Scientists'

² 1.3E-5/year was the failure frequency Duke Energy used in some of its risk assessments.

³ 2.9E-4/year is the failure rate the NRC has calculated for large rock-filled dams similar to Jocassee.

report on the vulnerability of US plants to Fukushima type disasters. Were the Commissioners withholding information from your committee? I don't believe so. I think what actually has happened is that crucial information has been withheld from them. They cannot testify before Congress about vulnerabilities of which they themselves have not been made fully aware.

To me, the most important tool the public has for ensuring good regulation and safety is accurate information. In a democratic republic such as ours, openness and transparency are essential in providing our citizens and their elected officials with the accurate information they need to make informed decisions.

To my knowledge, concerns that the flood wall at the Oconee Nuclear Station was too small first surfaced internally at Duke Energy in late 1993 and first made it to the NRC's attention in February 1994. The NRC dismissed the concerns in September 1994 as "not credible" because of an inappropriately low assumption regarding the failure rate of Jocassee Dam.

The issue regarding the inadequately sized flood wall resurfaced in March 2006. While attempting to defend a violation he had written against Duke Energy for inadequately controlling a two year breach in the flood wall ([ML061180451](#)), one of the NRC Resident Inspectors at Oconee Nuclear Station began researching the regulatory requirements for the flood wall.

In 2007 NRR's Division of Risk Assessment (NRR/DRA) determined that the annual failure probability of dams similar in construction to Jocassee is around $2.5E-4$ /year, which equates to a chance of once in every 4000 years ([ML100780084](#)).⁴ These might seem like good odds, but, given that a catastrophic failure of Jocassee Dam will lead to a Fukushima scenario in South Carolina, these odds make the risk of a significant accident and radiation release at Oconee Station about 100 times greater than the risks associated with a typical US commercial nuclear reactor.

In 2008 the NRC sent Duke Energy a 10CFR50.54(f) request ([ML081640244](#)) to obtain the necessary information to adequately determine if the risks posed to Oconee Nuclear Station by Jocassee Dam were acceptable. A 10CFR50.54(f) request is a rare occurrence and it undoubtedly got the attention of the Commissioners. However, because by this time the NRC was stamping all documents concerning Jocassee Dam as "Official Use Only - Security-Related Information" (OUO-SRI), it did not get the attention of the public.

My primary reason for bringing the Jocassee/Oconee issue to your attention is because, to me, it is an example of how lack of discipline regarding transparency has allowed a significant issue to go uncorrected for over six years and counting, with the current deadline for resolution still four years away. I believe that NRR's stamping of all documents concerning Jocassee Dam as

⁴ [ML100780084](#) is dated 2010-03-15. This is the formalized version of research and calculations performed in 2007 by Ferrante and Mitman of NRR/DRA.

"OUO-SRI" has not only prevented the public scrutiny necessary for our democratic and republican institutions to properly function, but has also inhibited the internal flow of information within the NRC and thereby has been detrimental to both public safety and security.

Duke Energy's response to the NRC's 10CFR50.54(f) request was, like the original request, withheld from the public under the guise of security. This response is the document which contains the Fukushima-style timeline regarding what would occur to the three reactors at Oconee were Jocassee Dam to catastrophically fail.⁵ It is unclear to me whether or not any of the Commissioners reviewed this document. It is ludicrous to expect the Commissioners to review every piece of correspondence received by the NRC – they have a staff of over 4,000 federal employees to assist with that. But I would assume that all important issues make it to their attention during their periodic briefings. However, based on the documents I have reviewed, I question the exact level of detail which they have received regarding the Jocassee/Oconee issue during their briefings from NRR.

On February 3, 2009 Commissioner Peter Lyons traveled to South Carolina to tour Jocassee Dam and Oconee Nuclear Station. In the briefing book prepared from him by NRR (ML090280474) there is a 25-line summary detailing the flooding issues. The 2008-08-15 10CFR50.54(f) request is mentioned in this summary. However, what did not make it into this summary is NRR/DRA's estimate that the failure rate of Jocassee Dam is about $2.5E-4$ /year and that in their 2008-09-26 response to the 20CFR50.54(f) request Duke Energy admitted that a catastrophic failure of Jocassee Dam would likely lead to the meltdown of all three reactor cores at the Oconee Nuclear Station and possibly the failure of the containment structures.

On February 20, 2009 two engineers from NRR's Division of Risk Assessment, Fernando Ferrante and Jeffrey Mitman, began routing an Information Notice (IN 2012-02) concerning the risks posed to some nuclear reactor sites due to dam failures. The purpose of this information notice (ML090510269) was:

... to alert addressees of a potentially nonconservative screening value for dam failure frequency that originated in 1980's reference documents which may have been referenced by licensees in their probabilistic risk assessment (PRA) for external events. Using a nonconservative screening value for dam failure frequency to evaluate the need for an additional detailed analysis may result in underestimating the risks to the plant associated with external flooding or loss of heat sink from the failure of upstream and

⁵ I cannot quote from Duke Energy's 2008-09-26 letter without the NRC claiming that this letter to you is now "Official Use Only – Security-Related Information" which must only be provided through their Office of Congressional Affairs (NRC/OCA). I respectfully suggest that your staff request ML082750106 and ML112430114 from NRC/OCA. The Fukushima-style timeline appears on p. 10 of attachment 2 of ML082750106 and on pp. 8-9 of ML112430114. It is also quoted on the fourth page of my 2012-09-18 letter to NRC Chairman Macfarlane.

downstream dams or levees. The NRC expects that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems.

Please note that this Information Notice was being routed more than two years prior to Fukushima occurring. That is, two years prior to the 2011-03-11 flooding-induced triple reactor accident at Fukushima, the NRC was aware that certain US plants might face a similar scenario were dams upstream of them to fail. However, this information notice was not released until more than three years later (March 5, 2012 which was nearly a year after Fukushima). The reason this information notice took more than three years to route was because of the controversial nature of NRR's indecisiveness regarding how to address the flooding vulnerabilities at Oconee and also because of the debate over whether dam break effects on nuclear reactors is a security concern which needs to be withheld from the American public.

In the past year, I have encountered many people, both within the NRC and external, who are adamant that the vulnerability which a failure of Jocassee Dam poses to the reactors at Oconee is a security liability which must be kept from the public. Although I am sympathetic to the desire not to broadcast our security liabilities, I have no tolerance for using concerns over security as a pretext for withholding important safety vulnerabilities from the public. When the Jocassee/Oconee issue first came to light in an April 28, 2006 publicly available inspection report, the issue was not being withheld. At some point in 2007 the NRC, either at the request of Duke Energy or on their own accord, decided to begin withholding from the public all correspondence regarding the safety liability posed by a failure of Jocassee Dam.

Is Jocassee Dam a credible target for terrorists and/or saboteurs? I don't know. But it does make sense to me that, in 2007, the NRC might reasonably want to withhold information regarding Jocassee/Oconee while they determined whether or not a security vulnerability existed and whether or not security measures were required to be put into place to protect it. What does not make sense to me, however, is that in 2012 we are still withholding from the public information on a vital safety concern under the guise of "Security-Related Information". After five years, have we not addressed the security concerns?

It is unreasonable to me that a government agency is allowed to withhold a significant public safety concern from the public under the guise of security, yet then not, after 5 years, do any meaningful study of the issue to determine if, in fact, a security vulnerability does exist and what must be done to remove it. Is there a security concern or isn't there? If there is, why, after five years, has it not been addressed? If there is not, then why, after five years, are we still withholding vital information from the public under the guise of security?

In April 2009, NRR was in the process of responding to Duke Energy regarding resolution of the Jocassee/Oconee issue. As part of the routing of that response, NRR's Division of Risk Assessment was asked for their concurrence. The Deputy Director of NRR/DRA, Melanie Galloway, refused to initial her concurrence block and instead submitted a Non-Concurrence

form (ML09117010) on April 6, 2009. Like all documents regarding Jocassee/Oconee, Ms. Galloway's Non Concurrence form is stamped "OUO-SRI" and I cannot quote from it. But a deputy division director submitting a Non-Concurrence is rare; this is a process that is mainly used by lower level staff, and even for them it is rare. Had Ms. Galloway's Non-Concurrence form – which in no way concerns security vulnerabilities – been publicly available, it would have likely gained the attention necessary to get the Jocassee/Oconee issue resolved in a timely manner.

Had intervenor groups such as the Union of Concerned Scientists been given access to Melanie Galloway's Non-Concurrence form via publicly available ADAMS, then they would have likely been able to counter the pressure which Duke Energy was placing on NRR. With dozens of their own engineers, lawyers and hired contractors, Duke Energy was able to convince NRR that, in order for improvements to Oconee's flooding defenses to be required, the NRC needed to probabilistically show that Jocassee Dam placed an inordinate risk upon the three reactors at Oconee. Pressure from the Union of Concerned Scientists and other intervenor groups, however, would have likely convinced NRR that, per Duke Energy's operating license for the Oconee reactors, in order for Duke Energy to be allowed to continue to operate the three reactors at Oconee they needed to deterministically show that these reactors were adequately protected from a catastrophic failure of Jocassee Dam.

On April 9, 2009 Chairman Jaczko was briefed by NRR on the Jocassee/Oconee issue. I don't exactly know what was said at this briefing. The briefing slides (ML091030172) mentioned that new calculations concerning the failure frequency of Jocassee Dam suggested that core damage frequency (i.e. the annual probability that a meltdown will occur) for the reactors at Oconee might be non-conservative by an order of magnitude. What is not mentioned in the slides is Duke Energy's Fukushima-style scenario (contained in their 2008-09-26 letter) of what would occur at Oconee Nuclear Station were Jocassee Dam to catastrophically fail.

On January 6, 2010 the leadership of NRR met to discuss the Jocassee/Oconee issue (ML100280954). The purpose of the meeting was whether NRR should issue an order to Oconee requiring them to, in a timely manner, mitigate the risks posed by a failure of Jocassee Dam, or whether NRR should merely issue another 10CFR50.54(f) request for information and potentially follow up with an order later. The "Cons" listed for the "10CFR50.54(f) option" were that it was not as enforceable as an order and that it had a slower response time for resolution of the external flooding issue. The "Cons" listed for the "order option" were that there was the potential for a public hearing and that an order required signature authority. In other words, to go the route of an order, the Commission and the public would need to be made aware of the risks which Jocassee Dam posed to Oconee. Despite the slower response time, NRR opted to go the route of the 10CFR50.54(f) letter and avoid the Commission and public scrutiny an order would entail.

In February 2010 – using information provided by Ferrante and Mitman of NRR/DRA – George Wilson submitted an informal memorandum to the NRC's Office of Nuclear Regulatory

Research (RES) requesting that a Generic Issue be assigned to investigate whether external flooding concerns, similar to those posed by Jocassee Dam to the three reactors at Oconee, existed elsewhere in our nation's fleet of 104 commercial reactor plants. George Wilson was the Dam Safety Officer in NRR's Division of Engineering (NRR/DE). At the time, we (i.e. RES/DRA/OEGIB) deemed Mr. Wilson's February 2010 memo to be too speculative and inflammatory to make it an official agency record; however, I have a copy of it if your committee staff requires it. This memo is an example of just how serious mid-level staffers in the various divisions of NRR viewed the Jocassee/Oconee issue. Keep in mind, this is over a year prior to the Fukushima accidents, yet the staff within NRR were presciently predicting the nuclear catastrophe that could occur were an inadequately sized flood wall to be overtopped allowing the flooding of the standby shutdown equipment necessary to remove decay heat from the reactor cores and containment buildings. Unfortunately it does not appear the managers at NRR were providing the Commissioners all the details of the NRR staff's concerns.

On June 22, 2010 NRR issued a Confirmatory Action Letter to Duke Energy (ML101730329) requiring them to (1) by August 2, 2010 provide an estimate of the volume of water impounded by the Lake Jocassee Dam to be used for flood height analyses at Oconee Nuclear Station, (2) by November 30, 2010 provide a list of modifications to be made at Oconee to adequately protect the plant from flooding due to a failure of the Lake Jocassee Dam, and (3) by November 30, 2011 have the provided modifications in place.

On July 19, 2010, NRR sent a formal memo to RES requesting a Generic Issue on flooding of nuclear power plant sites following upstream dam failures (ML101900305). In August 2010, the Operating Experience and Generic Branch (RES/DRA/OEGIB) of the Division of Risk Assessment in the NRC's Office of Nuclear Regulatory Research began working on a screening analysis report for what would become GI-204 (Generic Issue 204). In my opinion, the 2010-07-19 memo and the attendant screening report are evidence of the NRC staff identifying a significant vulnerability and striving to get it addressed. Please note that this issue was being forwarded without the hindsight of the Fukushima accident and entirely due to the analysis of the NRR staff and their determination to pro-actively address an issue significant to the safety of about a fifth of our nation's nuclear reactor plants.

On August 2, 2010, Duke Energy provided the NRC with an estimated volume of water to be assumed impounded by the Lake Jocassee Dam. Their estimate was a "sunny day" estimate. For reasons not understood by myself and other staff engineers at the NRC, Duke Energy believes that a failure of Jocassee Dam during an inordinately heavy rainfall (such as the one experienced in Senator Sanders' state in 2011 as the remnants of Hurricane Irene blew over parts of Vermont and New York) is not a credible scenario. In January 2011, Jeff Mitman of NRR/DRA challenged this assumption through the Non-concurrence process (ML110260443).

On November 29, 2010, Duke Energy informed the NRC that it was giving itself an additional 6 months to provide the list of modifications needed to protect the three reactors at Oconee from a failure of the Lake Jocassee Dam (ML103490330). Despite this issue being over four

years old in its current incarnation (and over 16½ years old from its 1994 incarnation), NRR did not object to Duke's 6 month extension.

By March 10, 2011 (the eve of the earthquake and tsunami in Japan), RES/DRA/OEGIB had drafted its screening analysis report for GI-204 and submitted it for routing. As you are well aware, on March 11, 2011 flooding induced from a tsunami disabled the emergency equipment at the Fukushima Dai-ichi reactors leading to the meltdowns of three reactor cores and the destruction of the buildings housing their containments. In the NRC's Office of Nuclear Regulatory Research, we assume that the accident in Japan would add a sense of urgency to the approval of GI-204 and the addressing of the flooding concerns at Oconee. Instead, it inordinately delayed both. I am in no position to completely understand what occurred, but from my second-hand vantage point it appears that the management at NRR viewed the true vulnerability exposed by Fukushima not to be the flooding issue at Oconee but rather their multi-year mismanagement of getting it addressed.

On April 29, 2011 Duke Energy provided the NRC the list of modifications it intended to do at Oconee to protect against a failure of Jocassee Dam (ML111460063). In this letter, Duke Energy extended the NRC's due date for implementation of the modifications from Nov. 30, 2011 to a nebulous commitment of 30 months after the approval of the modification plans by the NRC and FERC (the Federal Energy Regulatory Commission).

So, as of April 29, 2011 – seven weeks after the Fukushima accidents – the NRC's deadline for adequately protecting the Oconee reactors from a failure of Jocassee Dam had slid from November 30, 2011 to some indefinite time in roughly mid-2014.

As noted many times to your committee, the NRC has issued orders to all 104 reactor plants to make modifications based on the lessons learned from the Fukushima accident. What has likely not been noted to your committee is that the NRC has allowed Duke Energy to slide their mid-2014 due date for protecting Oconee from a Jocassee Dam failure to 2016 in order to conform with the Fukushima deadlines given to the other US reactor plants. But the three reactors at Oconee are different from the rest of the US fleet. Unlike the other 101 reactors, the three reactors at Oconee had a known external flooding concern that, over nine months prior to the Fukushima accident event occurring, had a November 30, 2011 deadline set (i.e. the 2011-11-30 deadline was established in a 2010-06-22 letter which was delivered to Duke Energy nearly 9 months prior to the 2011-03-11 tsunami occurring). The 2016 deadline is reasonable for the other 101 reactors because this was a new issue for them. But for the three reactors at Oconee, by the time the post-Fukushima orders came out they were already 5 years into the external flooding issue and had a deadline for modifications already set. Does it make sense that their already generous deadline be extended to match everyone else's?

The history I have provided you is little known within the NRC. Because of supposed security concerns, the Jocassee/Oconee issues are not discussed at All Hands Meetings. The issues are not discussed in sessions at the NRC's annual Regulatory Information Conference (RIC). The

issues do not appear in articles of Platts, or at American Nuclear Society conferences, or in online nuclear discussion groups, or in Union of Concerned Scientists blogs. Because of the OOU-SRI designation of all correspondence regarding this issue, there is virtually no internal oversight within the NRC to make sure NRR is properly handling this issue. And because of the OOU-SRI designations there was a strong push by NRR to force RES to remove all OOU-SRI material from the screening report for GI-204.

Like briefing packages for the Commissioners, Generic Issue screening reports are typically released to the public as part of the NRC's commitment to transparency. But it must be remembered that these reports are not written for public consumption – they are written for internal use. Briefing packages to the Commissioners are written to concisely inform the Commissioners of important points on key issues. Generic Issue screening reports are written to inform the screening panel members of the issues. Being that the Commissioners and the NRC staff are all authorized to view OOU-SRI documents, why would we water down our internal reports by removing all OOU-SRI material and thereby share less information with ourselves? I do not know the answer to that, but I have a suspicion.

When NRR knows a document – such as a Generic Issue screening report or a Commissioner briefing package – is going to eventually be released to the public, they prefer it be released without redactions. Redactions are a “red flag” for intervenor groups like Greenpeace and the Union of Concerned Scientists. If the Fukushima-style timeline from Duke Energy's 2008-09-26 letter were to appear in a briefing book for Commissioner Apostolakis' trip to Oconee, then NRR knows that, when that briefing book is eventually released with a paragraph from the “External Flooding” section redacted, David Lochbaum will be asking his connections on Capitol Hill to request the redacted section. To avoid this, NRR essentially “pre-redacts” it by not even including it in the first place. Unfortunately, in doing this they keep the Commissioners from obtaining vital information that the Commission needs to know to make important decisions.

And likewise for the screening panel for Generic Issue 204. Richard Perkins, the lead author of the “*Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures*” (ML112430114), was under constant pressure from NRR to remove the 2008-09-26 Duke Energy timeline from his report (he has a foot tall stack of internal NRC email correspondence to document it). Richard Perkins came to the NRC from the Department of Energy where he worked on the annual certification process for assuring the safety and reliability of America's nuclear weapons. He is a graduate of the National War College and was used to working with Top Secret and Special Compartmentalized Information (TS-SCI) on a daily basis. To him, the notion that the screening panel for GI-204 did not have a “need to know” the accident timeline from Duke Energy's 2008-09-26 letter was absolutely ludicrous. He has rhetorically asked me on many occasions, “Why would we want to redact this information from our internal report?”

On September 14, 2012 Richard Perkins submitted a letter to the NRC's Inspector General alleging that the NRC had “*intentionally mischaracterized relevant and noteworthy safety*”

information as sensitive, security information in an effort to conceal the information from the public. I assume the NRC's Office of the Inspector General (OIG) is investigating his complaint but am unaware of their findings. Given the NRC OIG's proclivity for narrowly focusing on procedural processes and not questioning the broader intent of those processes, I am doubtful that the OIG investigation will be conducted with a broad enough questioning attitude to adequately investigate Mr. Perkins' claims.

On September 12 & 13, 2011, Commissioner Apostolakis visited Jocassee Dam. In the NRR prepared briefing book for that visit (ML11244A024), the 25 line description of the External Flood section provided to Commissioner Lyons had shrunk to 9 lines. Although Commissioner Apostolakis' visit was a mere six months after Fukushima, no mention of Duke Energy's Fukushima-style timeline from their 2008-09-26 letter was made in the briefing book. Nor was there any mention of the failure probability of Jocassee Dam being in the same range as the probability of a 45 foot tsunami hitting the Fukushima Dai-ichi site.

On February 1, 2012 Commissioner Svinicki visited Jocassee Dam. NRR's briefing book for that visit (ML12026A549) contains a whole page on the External Flooding issue, yet does not mention the facts that (1) the issue has gone on for six years, (2) the Duke Energy accident timeline is very similar to Fukushima, (3) the flooding probability is similar to Fukushima, (4) NRR had assigned Duke Energy a 2011-11-30 deadline nine months prior to Fukushima, (5) seven weeks after Fukushima that 2011-11-30 deadline was extended by Duke Energy to mid-2014, and (6) the deadline for Duke Energy's propose modifications to their flooding defenses was later moved to 2016 to match the Fukushima action plan for all the plants without known flooding hazards. These are things that, were I Commissioner Svinicki, I would like to know before visiting Oconee – and, for that matter, before testifying before your committee on March 15, 2012.

On February 16, 2012 Duke Energy came to NRC headquarters for a "Drop-in Visit" with Bill Borchardt, the NRC's Executive Director for Operations (EDO). NRR's briefing book for that visit (ML12039A217) contains a page on the External Flooding issue which is similar to the one provided to Commissioner Svinicki. I do not know if Mr. Borchardt is aware of the true risk that Jocassee Dam poses to the three reactors at Oconee, but if all he knows is the summary in his briefing book, then there is much which he is unaware of yet needs to know.

On March 15 all five Commissioners testified before your committee at the Hearing on Post-Fukushima U.S. Reactor Safety. None of the Commissioners mentioned the fact that three reactors in Oconee County, South Carolina face a similar risk as was faced by the reactors at Fukushima Dai-ichi on March 11, 2011. I believe they did not mention it to your committee because it has been kept from them themselves.

On July 11, 2012 Duke Energy again visited Mr. Borchardt for a "Drop-in Visit" and on August 7, 2012 they dropped in on the Commissioners. As before, the briefing books supplied for these

visits (ML12188A071 & ML12206A325) did not mention the true risks posed by Jocassee Dam or the delays in resolving these risks.

If you believe the issues I have brought forward in this letter are of interest to your committee, then I respectfully suggest your staff seek answers to the following:

1. What is the official NRC determination as to the best estimate of the annual failure frequency of Jocassee Dam? How does this failure frequency compare to the annual frequency of a tsunami similar to the one in Japan on 2011-03-11 which caused the flooding induced nuclear accident at Fukushima Dai-ichi?
2. What is the official NRC position regarding whether or not a catastrophic failure of Jocassee Dam is a credible risk for which Duke Energy must deterministically show that the three reactors at Oconee Nuclear Station are adequately protected?
3. What is the official NRC position regarding whether or not the current flooding defenses at Oconee are adequate and what, if any, improvements need to be made?
4. What is the official NRC position regarding the most likely accident sequence at Oconee Nuclear Station were Jocassee Dam to catastrophically fail? How does this accident sequence compare to the March 2011 accident at Fukushima?
5. Assuming the catastrophic failure of Jocassee Dam, what is the NRC's best estimate of the likelihood that the operators at Oconee Nuclear Station would be able to restore cooling to the reactors prior to the containment buildings failing? What are the differences between the Oconee reactors and the Fukushima reactors that leads the NRC to believe the Oconee operators will be able to successfully restore cooling prior to containment failures? Has the NRC conducted any formal studies to estimate the success rate of Duke Energy's mitigation strategies to prevent containment failures in the event of a catastrophic failure of Jocassee Dam? If so, when were these studies conducted and what were the results?
6. Has the US NRC or any federal agency conducted an assessment to determine if Jocassee Dam is adequately protected from terrorist threats? If so, what were the results of the assessments? Is access to Jocassee Dam adequately guarded from terrorist attack? Are the employees at the Jocassee Hydro-Electric Facility screened for inside saboteurs to the same level at which nuclear workers at the Oconee reactors are screened? Is it necessary to continue to withhold from the public vital safety information concerning the risks which a failure of Jocassee Dam poses to the three reactors at the Oconee Nuclear Station?
7. Do the Commissioners believe that, prior to their March 15, 2012 testimony before the US Senate Committee on the Environment & Public Works, they were adequately informed of the vulnerability which Jocassee Dam poses to the reactors at the Oconee Nuclear Station?
8. When does the US NRC intend to release to the public their correspondence concerning Jocassee Dam and Oconee Nuclear Station? What is the justification for continuing to withhold this information from the American public and from public intervener groups?

such as the Union of Concerned Scientists? Does the NRC believe it would benefit from a review of its handling of the Jocassee/Oconee issue conducted by intervener groups?

Enclosed with this letter is a list of NRC correspondence, memos and studies regarding the Jocassee/Oconee issue. As can be seen from the enclosed list, this issue has festered in its current incarnation since 2006 and was originally brought forward to the NRC in 1994. Please note that most of the documents on the enclosed list are being withheld from the American public.

Although I am convinced the risks of a nuclear accident at Oconee are at least an order of magnitude greater than at a typical US reactor plant, I am not yet convinced that these risks are unacceptable. And although I do not know enough about nuclear security to judge whether or not all the security issues have been adequately addressed, at this time I do not believe a credible security threat to Jocassee Dam exists. I am not appealing to your committee with safety or security concerns. My concern is transparency, and how the lack of it has not only impeded this issue from getting the public scrutiny which it requires but may also be impeding this issue from getting the appropriate scrutiny from the Commissioners of the US Nuclear Regulatory Commission.

Very respectfully,

Lawrence S. Criscione, PE
Reliability & Risk Engineer
Operating Experience & Generic Issues Branch
Division of Risk Assessment
Office of Nuclear Regulatory Research
US Nuclear Regulatory Commission

(b)(6)

Enclosure

Cc: Senator James Inhofe, Ranking Member, Committee on Environment & Public Works
Senator Thomas Carper, Chairman, E&PW Subcommittee on Clean Air & Nuclear Safety
Senator John Barrasso, Ranking Member, E&PW Subcom. on Clean Air & Nuclear Safety
Senator Sheldon Whitehouse, Chairman, E&PW Subcommittee on Oversight
Senator Mike Johanns, Ranking Member, E&PW Subcommittee on Oversight
Chairman Allison Macfarlane, US Nuclear Regulatory Commission

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
1994-FEB-11		Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/93-25, 50-270/93-25, and 50-287/93-25)," dated February 11, 1994
1994-MAR-14		Letter from J. W. Hampton, Duke, dated March 14, 1994
1994-OCT-6		Internal NRC memo documenting a meeting between Region II and NRR concerning a hypothetical Jocassee Dam failure.
1994-DEC-19		Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (NRC Inspection Report Nos. 50-269/94-31, 50-270/94-31, and 50-287/94-31)," dated December 19, 1994
2000-MAR-15		Letter from David E. LaBarge, NRC, to W. R. McCollum, Jr., "Oconee Nuclear Station, Units 1, 2, and 3 Re: Review of Individual Plant Examination of External Events (TAC Nos. M83649, M83650, and M83651)," dated March 15, 2000
2006-APR-28	<u>ML061180451</u>	OCONEE NUCLEAR STATION - INTEGRATED INSPECTION REPORT 05000269/2006002, 05000270/200602, 05000287/2006002
2006-AUG-31	<u>ML080780143</u>	IR 05000269-06-016, IR 05000270-06-016, IR 05000287-06-016, on 03/31/2006, Oconee Nuclear Station - Preliminary White Finding
2006-OCT-5	<u>ML062890206</u>	Oconee, Units 1, 2 & 3 - Response to Preliminary White Finding
2006-NOV-22	<u>ML063260782</u>	IR 05000269-06-017, IR 05000270-06-017, IR 05000287-06-017, Final Significance Determination for a White Finding and Notice of Violation, Duke Energy Carolinas, LLC
2006-DEC-20	<u>ML063620092</u>	Oconee, Units 1, 2, & 3, Appeal of Final Significance Determination for White Finding and Reply to Notice of Violation; EA-06-199
2007-JAN-29	<u>ML070440345</u>	Summary of Revised Fragility Evaluation Results for Jocassee Dam
2007-FEB-5		Letter from Bruce H. Hamilton, Duke, to NRC, "Seismic Fragility Study"
2007-FEB-22	<u>ML070590329</u>	Manual Chapter 0609.02 Appeal Panel Recommendations (Oconee Reply to a Notice of Violation and White Finding (EA-06-199))
2007-MAR-1	<u>ML070610460</u>	Oconee Appeal Panel Review of Manual Chapter 0609.02 Appeal Panel Review of Oconee Standby Shutdown Facility White Finding (EA-06-199)
2007-MAY-3	<u>ML072970510</u>	Oconee, Units 1, 2 and 3 - Request for NRC to Review Appeal of Final Significance Determination for SSF Flood Barrier White Finding
2007-JUN-22	<u>ML071580259</u>	Consideration of New Information Associated with a Final Significance Determination for a White Finding - Oconee NS
2007-JUN-28		Phone call between the NRC and Duke Energy
2007-OCT-1	<u>ML072770765</u>	10/01/2007, Slides with Notes for Final Regulatory Assessment of Oconee Flood Barrier Issue
2007-OCT-1	<u>ML072770775</u>	Dam Failure Information
2007-OCT-1	<u>ML072770777</u>	Questions and Answers Related to Oconee Flood Barrier
2007-NOV-20	<u>ML073241045</u>	Reconsideration of Final Significance Determination Associated with Standby Shutdown Oconee Facility Flood Barrier White Finding
2008-MAY-19	<u>ML081350689</u>	Briefing Package For Drop-In Visit By Duke Energy Chief Nuclear Officer With Chairman Klein And Commissioner Jaczko On May 21, 2008
2008-JUN-23	<u>ML082390669</u>	Proposal for a Risk Analysis of the Failure of the Jocassee and Keowee Dams to Assess the Potential Effects on the Safe Shut Down Facility of the Oconee Nuclear Station, South Carolina
2008-JUL-28	<u>ML082120390</u>	Oconee Nuclear Station - Revisions to the Selected Licensee Commitments Manual (SLC)

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2008-AUG-15	ML081640244	Information Request Pursuant to 10 CFR 50.54(F) Related to External Flooding, Including Failure of the Jocassee Dam at Oconee Nuclear Station, Units 1, 2, and 3 (TAC Nos. MD8224, MD8225, and MD8226)
2008-AUG-26	ML082390690	Kick Off for Risk Analysis of the Failure of the Jocassee and Keowee Dams to Assess the Potential Effects on the Safe Shutdown Facility at the Oconee Nuclear Station
2008-AUG-28	ML083300427	08/28/2008 - Summary of Closed Meeting to with Duke Energy Carolinas, LLC to Discuss the August 15, 2008, 50.54(f) Letter on External Flooding (TAC Nos. MD8224, MD8225, and MD8226)
2008-AUG-28	ML082550290	Meeting with Duke Energy Carolinas, Oconee Flood Protection and the Jocassee Dam Hazard
2008-SEP-6	ML082250166	Oconee Nuclear Station - Communication Plan for Information Request Related to Failure Frequencies for the Jocassee Pumped Storage Dam (Jocassee Dam) at the Oconee Nuclear Station and Potential Generic Implications
2008-SEP-26	ML082750106	Oconee, Units 1, 2 and 3 - Response to 10 CFR 50.54(f) Request
2008-NOV-5	ML091060761	11/05/08 Summary of Closed Meeting with Duke on External Flooding Issues, including failure of the Jocassee Dam, at Oconee Nuclear Station, Units 1, 2, and 3
2008-NOV-5	ML083390650	11/05/2008 Meeting Slides, "Oconee Site Flood Protection," NRC Meeting with Duke Energy Carolinas, LLC
2008-DEC-4	ML091420319	12/04/2008 Meeting Summary, Meeting to Discuss External Flooding at Oconee Nuclear Station (Reissuance, with Error on Page 3 Corrected)
2008-DEC-4	ML090480044	Oconee Nuclear Station, External Flood NRR Meeting, Rockville, MD, December 4, 2008
2009-FEB-3	ML090280474	Briefing Package for Commissioner Lyons Visit to Oconee on February 4, 2009
2009-APR-6	ML091170104	Oconee Nuclear Station, Units 1, 2 And 3 - Non-concurrence on Evaluation of Duke Energy Carolinas, LLC September 26, 2008, Response to Nuclear Regulatory Commission Letter Dated August 15, 2008 Related to External Flooding
2009-APR-9	ML091030172	Oconee External Flooding Briefing for Commissioner Jaczko
2009-APR-30	ML090570779	Oconee Nuclear Station Units 1, 2, and 3, Evaluation of Duke Energy Carolinas September 26, 2008, Response to External Flooding, Including Failure of the Jocassee Dam
2009-MAY-11	ML092940769	05/11/2009 Summary of Closed Meeting with Duke Energy Carolinas, LLC, to Discuss Preliminary Results of the Recent Inundation and Sensitivity Studies Concerning Failure of the Jocassee Dam and Resultant Flooding at Oconee Nuclear Station, 1, 2, and 3
2009-MAY-11	ML090820470	5/11/2009 Notice of Forthcoming Closed Meeting with Duke Energy Carolinas, LLC, to Discuss Sensitivity Studies Concerning Failure of the Jocassee Dam & Resultant Flooding at the Oconee Nuclear Station, Unit 1, 2, & 3
2009-MAY-11	ML091380424	Oconee Nuclear Station, Slides for Closing Meeting May 11, 2009 with Duke on the Oconee Flooding Issue
2009-MAY-20	ML091470265	Oconee, Units 1, 2 & 3, Request for Extension of Duke Response Time to Referenced Letter
2009-MAY-26	ML091480116	E-mail re Briefing Package for Visit to Jocassee Dam on June 23, 2009
2009-JUN-1	ML091590046	Oconee, Units 1, 2, and 3, Request to Withhold Sensitive Information in Presentation Materials Left with Staff
2009-JUN-10	ML091680195	Oconee, Units 1, 2, and 3 - Interim 30-Day Response to Reference 2.

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2009-JUN-11	ML091620669	6/11/09 Summary of Closed Meeting with Duke Carolina to Discuss External Flooding at Oconee
2009-JUN-25	ML091760072	NRC Site Visit to the Oconee Nuclear Station on June 15, 2009
2009-JUL-9	ML092020480	Oconee, Units 1, 2, & 3; Final 60-Day Response to Reference 2
2009-JUL-28	ML092230608	Oconee, Submittal of Selected Licensee Commitments Manual SLC Revision
2009-AUG-12	ML090570117	Oconee Flood Protection and the Jocassee Dam Hazard Basis for NRC Allowing Continued Operation
2009-AUG-27	ML092380305	Oconee, Slides for Closed Meeting Regarding External Flood Technical Meeting On August 27, 2009
2009-SEP-25	ML092710344	Site Visit Observation on 09/25/2009 by Joel Munday for Oconee
2009-OCT-28	ML093080034	10/28/09 Slides for Oconee Nuclear Station, Units 1, 2, and 3 - Meeting Slides - External Flood NRC Technical Meeting
2009-NOV-30	ML093380701	Oconee Nuclear Station, Units 1, 2, and 3, Oconee External Flood Analyses and Associated Corrective Action Plan
2009-DEC-4	ML090680737	12/04/09 Summary of Closed Meeting to Discuss the Duke Energy Carolinas, LLC., 09/26/08 Response to NRC's August 15, 2008 50.54(f) Letter on External Flooding at Oconee
2010-JAN-6	ML100280954	01/06/2010 Briefing to the Executive Team on the Oconee Nuclear Station External Flooding Issue
2010-JAN-11	ML100150066	Request Additional Information Regarding the Oconee External Flooding Issue
2010-JAN-15	ML100210199	Oconee, Units 1, 2 and 3 - Additional Information Regarding Postulated External Flood Threat Issues
2010-JAN-29	ML100271591	Evaluation of Duke Energy Carolina, LLC (Duke), November 30, 2009, Response to Nuclear Regulatory Commission (NRC) Letter Dated April 30, 2009, Related to External Flooding At Oconee Nuclear Station, Units 1, 2, And 3 (Oconee)
2010-FEB-8	ML100470053	Oconee, Units 1, 2, & 3, External Flood, Response to Request for Additional Information
2010-FEB-26	ML100610674	Oconee, Units 1, 2, & 3, External Flood Revised Commitment Letter
2010-MAR-5	ML103430047	Oconee Nuclear Station, Units 1, 2, & 3, Letter From Duke Energy Carolinas, LLC Regarding External Flood, Response to Request For Additional Information
2010-MAR-15	ML100780084	Generic Failure Rate Evaluation for Jocassee Dam Risk Analysis
2010-MAR-18	ML100810388	Prepare Briefing Book and Material for Eric Leeds for the Duke Fleet Meeting on March 18, 2010
2010-APR-14	ML100760109	Generic Failure Rate Evaluation for Jocassee Dam
2010-MAY-27	ML101600468	Oconee, Units 1, 2 & 3, Response to Requested Information on the Protection Against External Flooding Including a Postulated Failure of the Jocassee Dam
2010-JUN-1	ML101750619	OUO - Communication Plan For Issuance of Confirmatory Action Letter To Duke For Oconee - External Flooding June 2010
2010-JUN-3	ML101610083	Oconee Nuclear Station, Units 1, 2, and 3, - External Flood Commitments
2010-JUN-22	ML101730329	Oconee, Units 1, 2 & 3, Confirmatory Action Letter (CAL 2-10-003), Commitments to Address External Flooding Concerns
2010-JUN-29	ML101890803	06/29/2010 Summary of Closed Meeting With Duke Energy Carolinas, LLC, to Discuss External Flooding at Oconee
2010-JUL-7	ML101880768	OUO - IR 05000269-10-002, 05000270-10-006, 05000287-10-006; 01/01/2010 - 03/31/2010; Oconee Nuclear Station Units 1, 2 and 3; Interim Compensatory Measures for External Flood
2010-JUL-19	ML101900305	Identification of a Generic External Flooding Issue Due to Potential Dam Failures

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2010-AUG-2	ML102170006	Oconee Units 1, 2, & 3, Response to Confirmatory Action Letter (CAL) 2-10-003
2010-OCT-20	ML102910480	NRC Assessment of Oconee External Flooding Issue (October 18, 2010)
2010-OCT-26	ML102990064	NRC Staff Assessment of Duke Energy Carolinas, LLC, Oconee External Flooding Issue (TAC NOS. ME4441, ME4442, and ME4443)
2010-NOV-29	ML103490330	Oconee Nuclear Site, Units 1, 2, and 3, Oconee Response to Confirmatory Action Letter (CAL) 2-10-003
2011-JAN-5	ML110180609	Enclosure 1, Oconee Nuclear Station, Major Project Plans
2011-JAN-10	ML110260443	Non-concurrence on Oconee Assessment Letter
2011-JAN-28	ML110280153	Staff Assessment of Duke's Response to Confirmatory Action Letter Regarding Duke's Commitments To Address External Flooding Concerns At The Oconee Nuclear Station, Units 1, 2, And 3 (ONS) (TAC NOS. ME3065, ME3066, and ME3067)
2011-MAR-5	ML103410042	Supplement to Technical Basis for Allowing Oconee Nuclear Station to Remain in Operation Through November 2011, Associated with the External Flooding Issues
2011-MAR-15	ML110740482	Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures
2011-APR-29	ML111460063	Oconee Nuclear Site, Units 1, 2, and 3, Response to Confirmatory Action Letter (CAL) 2-10-003
2011-AUG-16	ML11229A710	E-mail re Briefing Package for Visit to Oconee Nuclear Power Plant on September 12-13, 2011
2011-AUG-18	ML11174A138	Oconee Nuclear Station, Units 1, 2, and 3, Assessment of Duke Energy Carolinas, LLC April 29, 2011, Response to Confirmatory Action Letter Regarding Modifications to Address External Flooding Concerns (TAC Nos. ME6133, ME6134, and ME6135)
2011-AUG-31	ML112430114	Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures
2011-SEP-1	ML11244A024	Briefing Package for Visit to Oconee Nuclear Power Plant on September 12-13, 2011
2011-OCT-3	ML11278A173	Oconee Nuclear Station (ONS), Units 1, 2, and 3, Response to Requests for Additional Information Regarding Necessary Modifications to Enhance the Capability of the ONS Site to Withstand the Postulated Failure of the Jocassee Dam
2011-OCT-17	ML11294A341	Oconee Nuclear Station (ONS), Units 1, 2, and 3, Response to Requests for Additional Information Regarding Necessary Modifications to Enhance the Capability of the ONS Site to Withstand the Postulated Failure of the Jocassee Dam
2011-DEC-16	ML113500495	Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Power Plant Sites Following Upstream Dam Failures_redacted
2012-JAN-26	ML12026A549	Briefing Package for Commissioner Svinicki Visit to Oconee on February 1, 2012
2012-JAN-31	ML12026A254	Communication Plan for Oconee Nuclear Station (ONS) Following Issuance of GI-204
2012-FEB-3	ML12039A239	Oconee, Units 1, 2 and 3 - Request for Withholding from Public Disclosure Duke Energy Letter Dated May 20, 2009 Involving Postulated Failure of the Jocassee Dam
2012-FEB-9	ML12039A217	Briefing Package Request for Meeting with Duke Energy on February 16, 2012

List of NRC Correspondence, Memos and Studies Regarding Failure of Jocassee Dam

Date	ADAMS	Title
2012-FEB-17	ML12053A016	Duke Energy Carolinas, LLC - Recommended Revisions to the Oconee Nuclear Station Section of NRC's Screening Analysis Report for the Proposed Generic Issue on Flooding of Nuclear Plant Sites Following Upstream Dam Failure
2012-FEB-23	ML12058A236	02/23/12 Summary of a Teleconference between the US NRC and Duke Energy Regarding Comments made by Duke Energy Concerning the Issuance of the Screening Analysis Report for Generic Issue 204
2012-MAR-5	<u>ML090510269</u>	NRC Information Notice 2012-002 Potentially Nonconservative Screening Value For Dam Failure Frequency In Probabilistic Risk Assessments
2012-MAY-15	ML12129A186	Oconee Nuclear Station, Units 1, 2, and 3 - Request for Additional Information Regarding Modifications to Address the External Flooding Concerns (TAC NOS. ME7970, ME7971, AND ME7972)
2012-JUN-14	ML12167A372	Oconee, Units 1, 2, and 3, Response to Requests for Additional Information Regarding Modifications to Address External Flooding Concerns
2012-JUL-11	ML12215A327	07/11/2012 Licensee Non-Public Meeting Slides on Oconee External Flood Mitigation
2012-JUL-11	<u>ML12188A071</u>	Briefing Package for Meeting with Duke Energy on July 11, 2012
2012-AUG-7	<u>ML12206A325</u>	Briefing Book for Meeting with Duke Energy on August 7, 2012
2012-SEP-20	ML12268A404	Communication Plan for Flooding September 2012
2012-SEP-20	ML12219A163	Oconee Nuclear Station, Units 1, 2 and 3 - Response to Questions Regarding Modifications to Address External Flooding Hazards (TAC Nos. ME7970, ME7971, AND ME7972)

Criscione, Lawrence

From: Perkins, Richard
Sent: Monday, December 03, 2012 3:44 PM
To: Criscione, Lawrence
Subject: Various presentations, e-mail 1 of 2
Attachments: Presentation to GIP Panel Briefing 2011_04_29.pptx

This attachment is publicly available as ML15111A052

Richard H. Perkins, P.E.
Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Division of Risk Analysis
Operating Experience and Generic Issues Branch
Phone - 301/251-7479

Criscione, Lawrence

From: Perkins, Richard
Sent: Monday, December 03, 2012 3:45 PM
To: Criscione, Lawrence
Subject: Various presentations, e-mail 2 of 2
Attachments: RES Seminar on GI204_July 5 2012.ppt; SRA Region 1 Brief_10-13-11_dlstro.ppt; Criteria Slides.ppt; Management_Brief_Dec2011_MBslides_2011_12_19_v3.ppt; Panel Brief.ppt

Richard H. Perkins, P.E.
Nuclear Regulatory Commission
Office of Nuclear Regulatory Research
Division of Risk Analysis
Operating Experience and Generic Issues Branch
Phone - 301/251-7479

C/32a

**Flooding of U.S. Nuclear Power Plant Sites
Following Upstream Dam Failure:
Generic Issue Screening Analysis Method**

Richard H. Perkins, P.E.

**Office of Nuclear Regulatory Research
Division of Risk Analysis
Operational Experience and Generic Issues Branch**

Visit our intranet website at
<http://www.internal.nrc.gov/RES/projects/GIP>

Objectives of Presentation

- ✓ Discuss the nature of a Generic Issue Screening Analysis
- ✓ Provide high-level overview of topic
- ✓ Describe content of screening analysis

Part 1:

**What is a Generic Issue
Screening Analysis**

**The Generic Issues
Program** is a
Congressionally mandated,
agency-wide program to
address issues that have
significant generic
implications related to
safety or security which
cannot be more effectively
resolved by other
regulatory programs or

Visit our intranet website at

<http://www.internal.nrc.gov/REG/Programs/GIP>

What is Special about a Generic Issue?

- The term “Generic Issue” is an official designation and conveys special recognition and treatment of the issue
- The status of all active Generic Issues is provided in a report to Congress every six months
- The status of all active Generic Issues is reported in a public document every 90 days.
- 10CFR52.47(a)(21) requires license applications to address (propose a technical resolution for) any issue that has been listed in NUREG 0933 for more than 6 months prior to the docket date of the application and which are technically relevant to the design.
- Generic Issues Program provides visibility, regular reporting and tracking of regulatory changes until such changes are implemented and verified.

Stages

- Identification
 - Acceptance Review
 - Screening
 - Safety Risk Assessment
 - Regulatory Assessment
- Pre GI
- Generic Issue

Coordination During Screening of GI-204

- Screening analysis development
- Generic Issue Review Panel briefings
(with inter-office discussion)
- Formal Inter-office coordination of
recommendation memorandum
- Community development of communication plan
- Formal coordination of the communication plan
- Pre-release meetings
- Rollout

GI-204 Declaration Timeline – Internal Information – ~~Not for Public Release~~

12/14/11

Documents Required for GI Declaration:

<u>Documents Required for GI Declaration:</u>	<u>Status</u>
Recommendation Memo from GI Review Panel	Approved by GI Review Panel.
Communication Plan (non public)	Approved and available for use
Screening Analysis Report (enclosure)	Completed and final (not released)
OPA Press Release	Approved by Chairman's Office – awaiting release Subject to continuing edits in real time

Significant Critical Path Tasks:

With RES Director for review and consideration for approval

Sequence and Timeline: [Organization responsible for action]

- Formal coordination of **Communication Plan** is completed
- RES Director: Signs out **Communication Plan** (non public)
- Approved **Communication Plan** is distributed to communication team [RES]
- 3 work days RES Director: Approves **GI Recommendation Memo** (release clock begins)
- 3 work days Public release day (not Friday) and time is selected with OPA [OPA & RES]
- 3 work days 'Heads up' notification to Regional State Liaison Officers (RSLOs) and OCA [RES]
- 2 work days Communication Team is notified of release day and time [RES]
- 2 work days Communication Team notifies internal stakeholders [Communication Team Members]
- As appropriate RSLO actions and communications with States [RSLOs]
- 0 time **OPA Press Release** [OPA]
- +1 hour **Recommendation Memo** and **Screening Analysis Report** become publicly available in ADAMS [RES]
- +1 hour Communication Team is notified of press release and document status [RES]

POC: Richard Perkins,
NRC/RES/DRA/OEGIB
richard.perkins@nrc.gov
301-251-7479

Part 2:
High-level overview of topic

Key Messages

- Reevaluation of the effect of dam failures is appropriate based on new information
- Evaluation of the issue will continue to the next stage of the Generic Issues Program
- The screening analysis was a limited scope assessment
- Screening analysis was completed before events at Fukushima and Fort Calhoun Station
- No immediate safety concerns were identified
- **Note:** GI-204 has been incorporated into the tasks under the Fukushima Near-Term Task Force

Scope

- **Generic Issue-204 applies to:**
 - Operating nuclear power plants
 - Spent fuel pools
 - Sites undergoing decommissioning with spent fuel still in the spent fuel pools
- **Related issues proposed as separate Generic Issues:**
 - Effect of downstream dam failures on availability of cooling water
 - Proposed, accepted, currently undergoing screening
 - Effect of upstream dam failures on fuel facilities
 - Issue was proposed and was not accepted
 - Effect of external flooding on ISFSIs
 - Proposed, undergoing acceptance review

Plants Referenced in Screening Analysis

- **Region 1**

- Beaver Valley
- Hope Creek
- Indian Point
- Peach Bottom
- Three-Mile Island
- Vermont Yankee

- **Region III**

- Prairie Island

- **Region II**

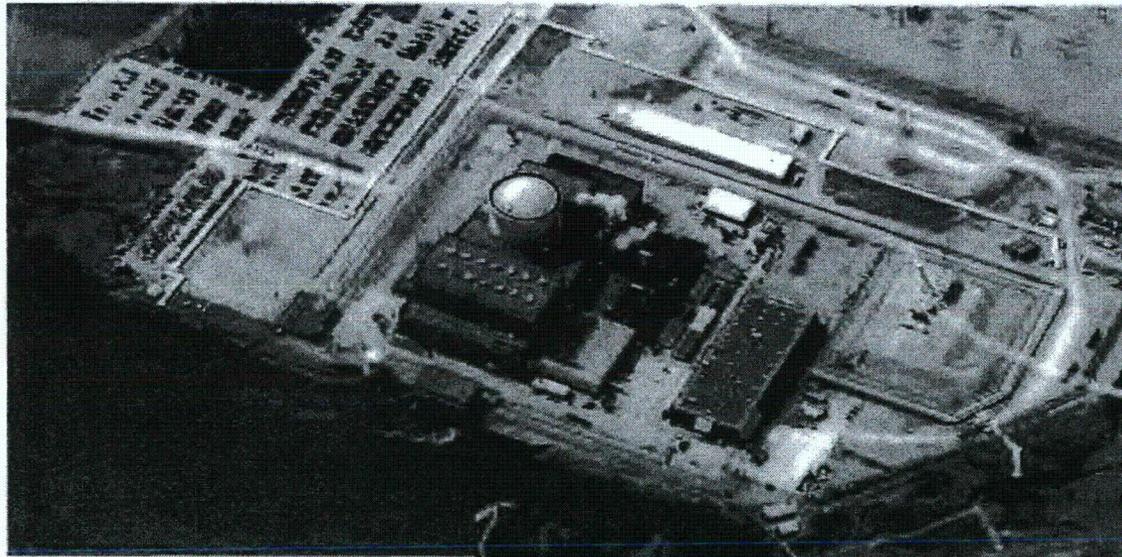
- Browns Ferry
- McGuire
- Oconee
- H.B. Robinson
- Sequoyah
- Surry
- Waterford
- Watts Bar

- **Region IV**

- Arkansas Nuclear
- Columbia
- Cooper
- South Texas
- Fort Calhoun

Part 3:
**Overview of screening
assessment**

Precursor Events: Background on Fort Calhoun and Oconee

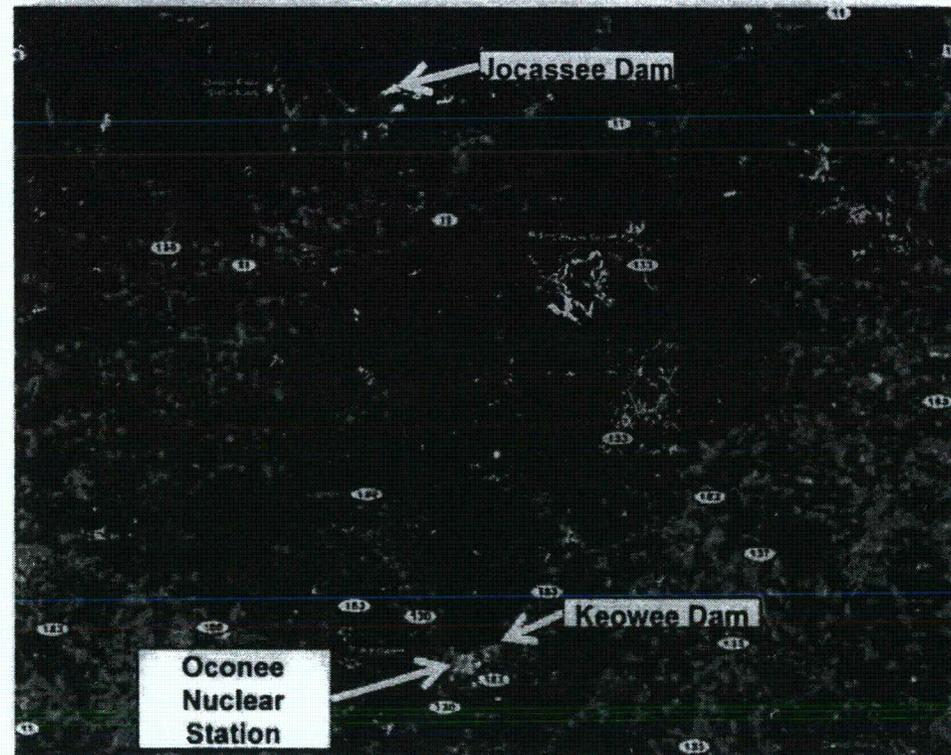


Insufficient
Procedures

Flood Barrier
Penetrations



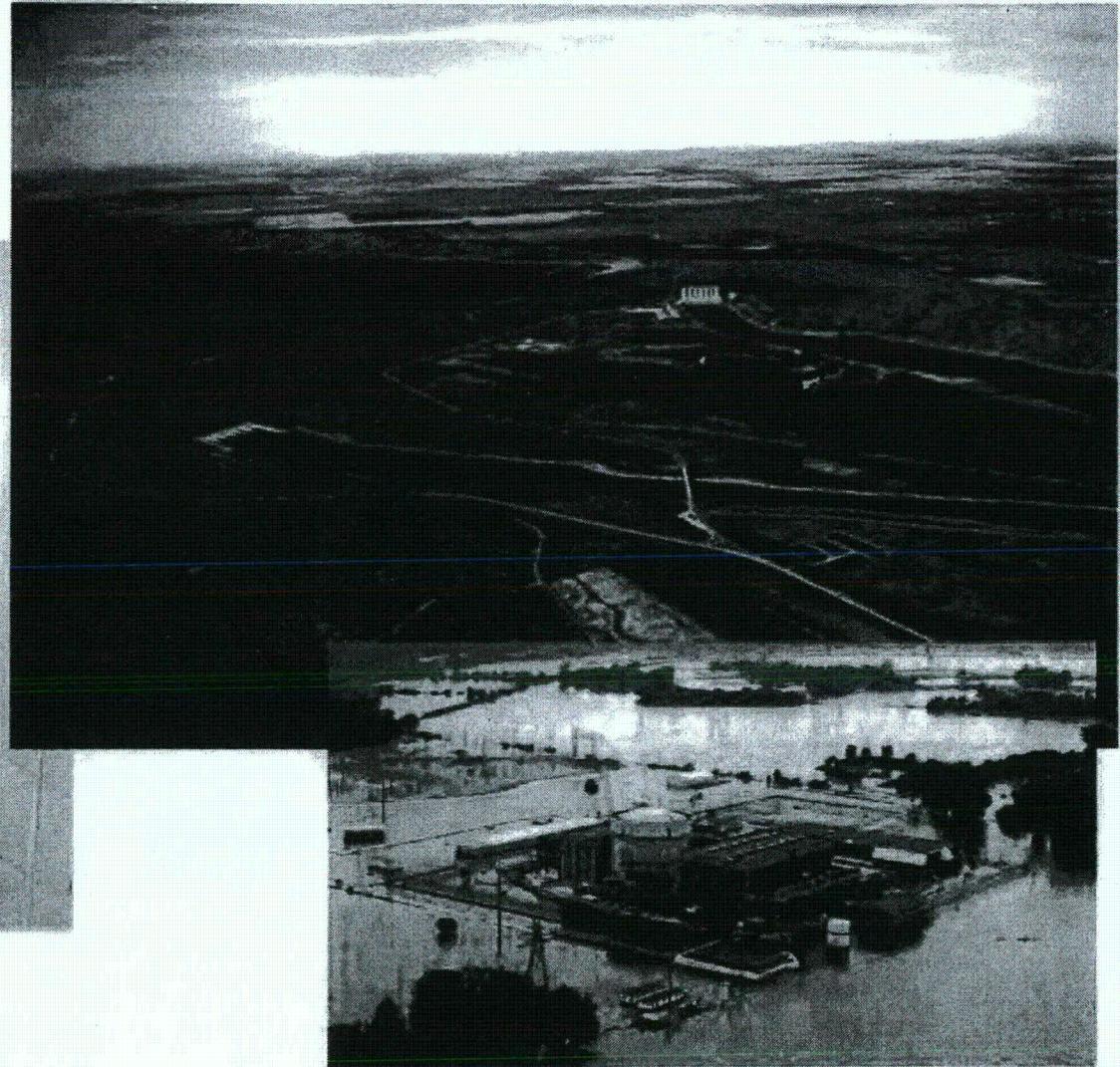
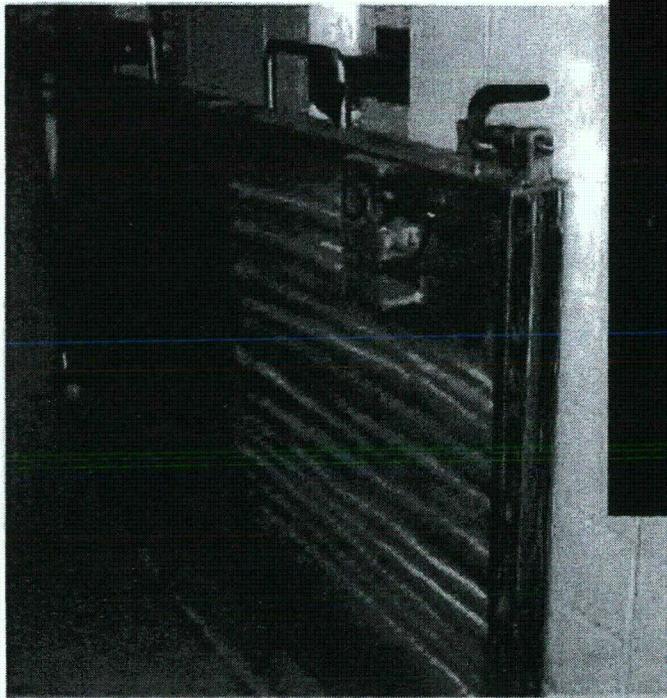
Precursor events con'd: Experience at Oconee Nuclear Station



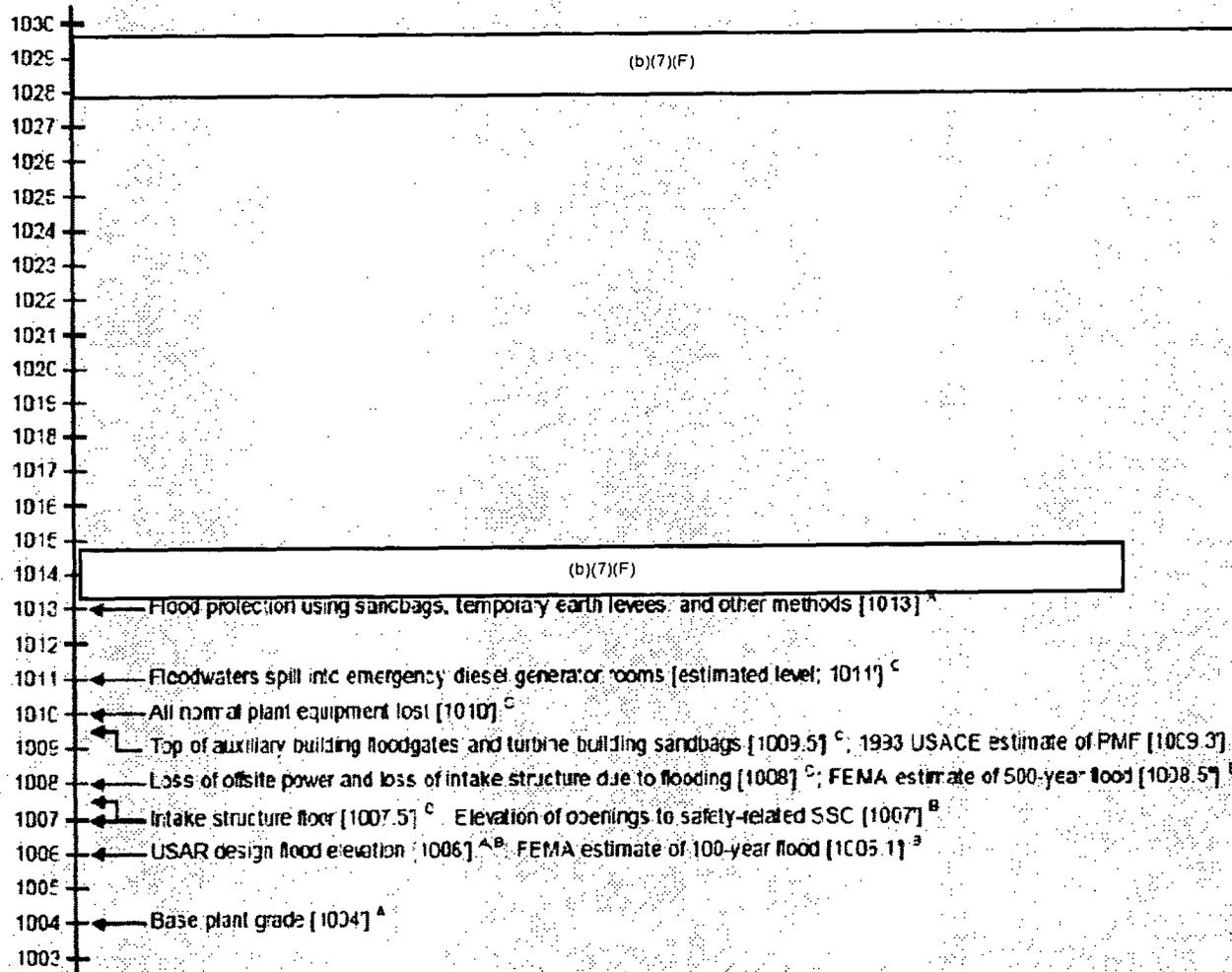
Given catastrophic dam failure, containment failure appeared likely

- LOOP
 - SSF Failure
 - Failure of Keowee Dam
- } → Degradation Timeline

Precursor events con'd: Recent experience at Fort Calhoun



Precursor events con'd: Fort Calhoun Station Flood Levels



Examination of applicability to multiple plants: General approach

Clear identification of the issue at ONS and FCS

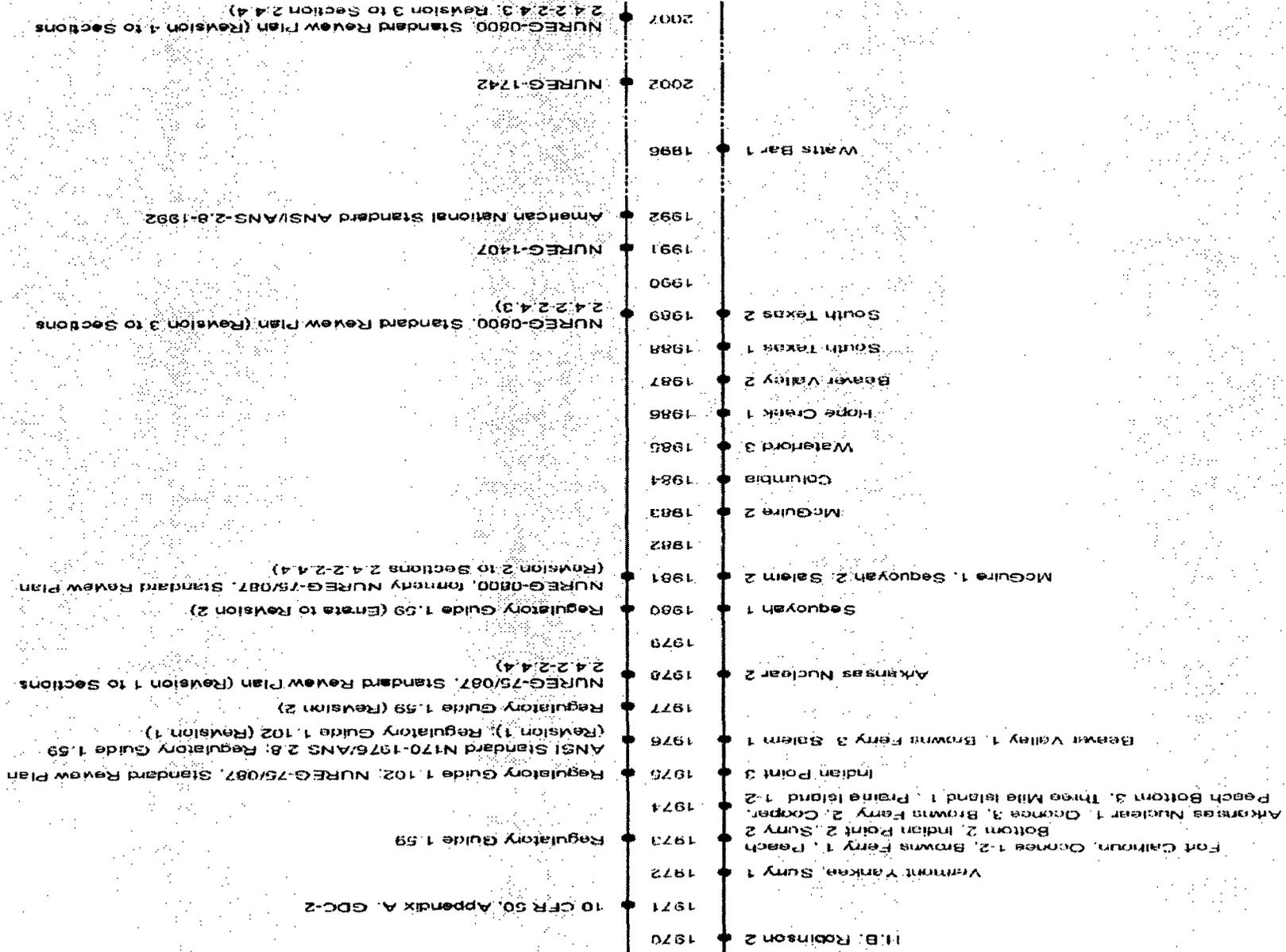
Difficulty stating a generic class of applicable plants.

- FSAR and IPEEE did not necessarily reveal an issue
- Lack of (identified) *readily available* conclusive information

Use of “signature characteristics”

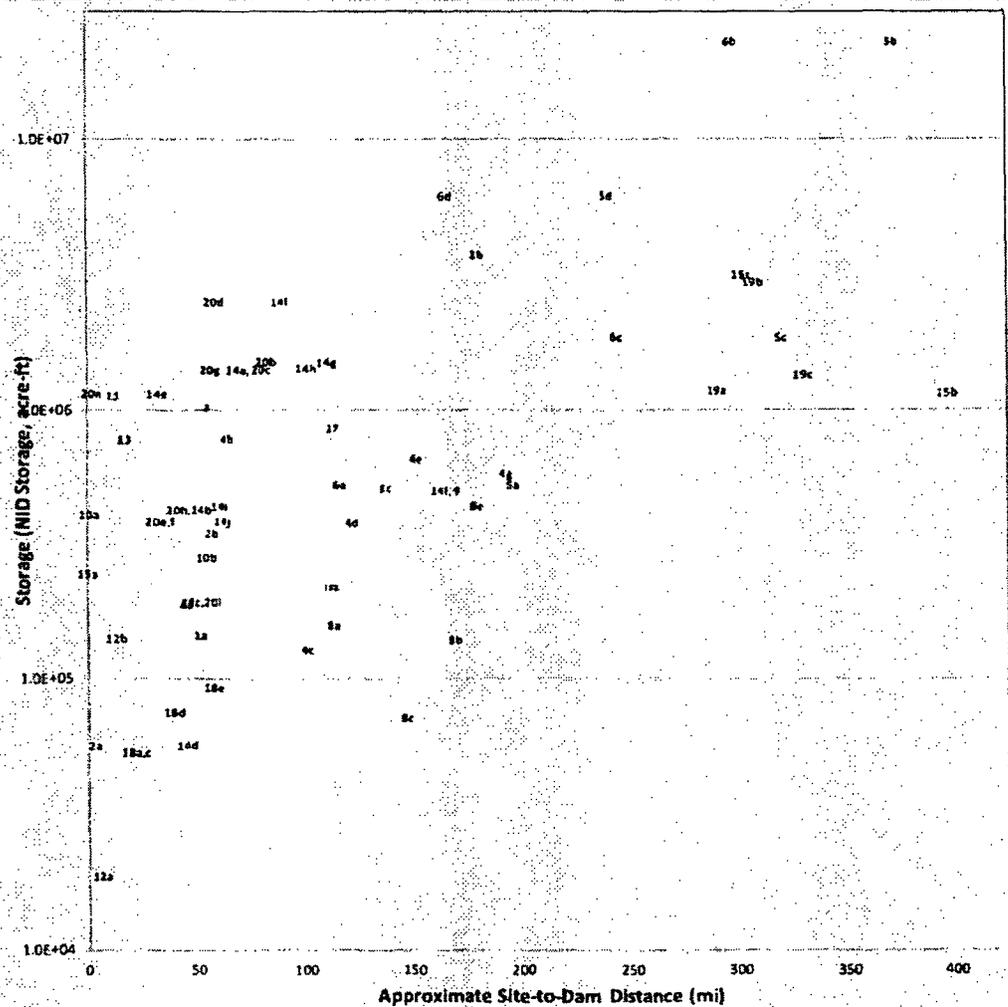
- Reliance on the placement of temporary barriers
- Challenging circumstances during flood management
- Certain features assumed to have a success probability of 1
(Dikes, levees, doors, hatches, or untested equipment)
- Limited time window for response
- Small or negative margins under less than ideal circumstances
- Significant events “screened out” where reconsideration may be appropriate
- Evaluation coincident with less than PMF

Timeline of Plan Operating License Issuance vs. Publication Dates

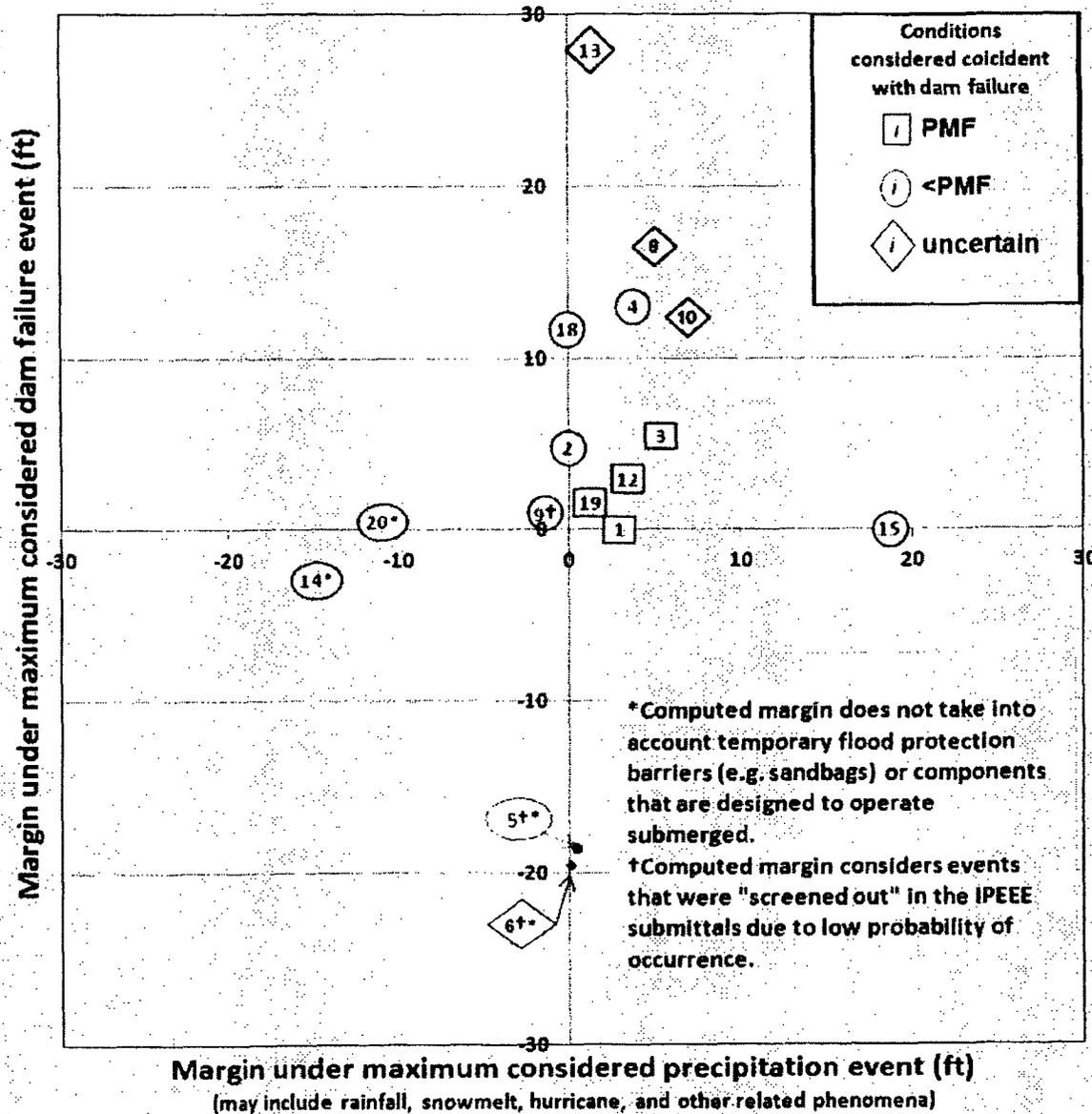


Examination of applicability to multiple plants: Location of dams relative to NPP sites

- In the Generic Issue Proposal, 20 plants were identified
- Plant-specific documents were reviewed along with data from the National Inventory of Dams
- Key observations:
 - Many nuclear power plants are located downstream of dams
 - Dams upstream of plants have varying characteristics, sizes, capacities, purposes, and are regulated by different agencies



Margin under maximum considered precipitation event



ML112430114

The Generic Issue Criteria:

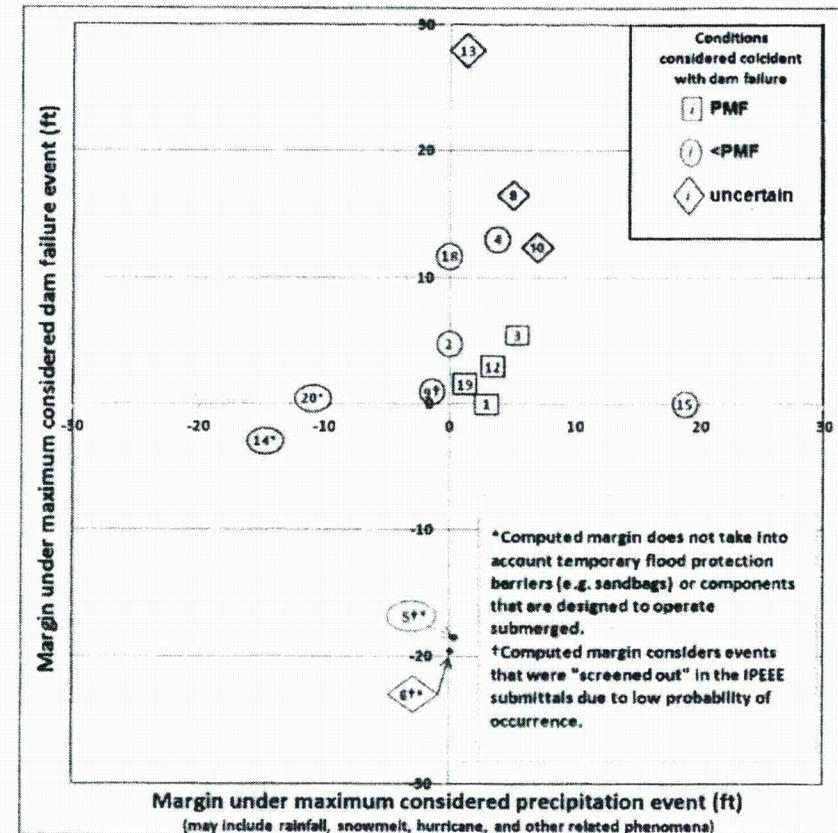
- 1 – The issue affects public health and safety, the common defense and security, or the environment**
- 2 – The issue applies to two or more facilities and/or licensees/certificate holders, or holders of other regulatory approvals**
- 3 – The issue cannot be readily addressed through other regulatory programs and processes; existing regulations, policies, or guidance; or voluntary industry initiatives**
- 4 – The issue can be resolved by new or revised regulation, policy, or guidance**
- 5 – The issue's risk or safety significance can be adequately determined (i.e., it does not involve phenomena or other uncertainties that would require long-term studies and/or experimental research to establish the risk or safety significance)**
- 6 – The issue is well defined, discrete, and involves a radiological safety, security, or environmental matter**
- 7 – Resolution of the issue may potentially involve review, analysis, or action by the affected licensees, certificate holders, or holders of other regulatory approvals**

The Generic Issue Criteria (shorthand):

- 1 – Pose an appreciable risk to safety, security, or the environment
- 2 – Apply to two or more plants
- 3 – Cannot be readily addressed by current NRC regulatory process
- 4 – But can be addressed by an NRC regulatory process
- 5 – There has to be a way that we can calculate, estimate, or otherwise understand the risk
- 6 – You have to be able to tell us specifically what the issue is, so we know what the issue is
- 7 – Conceivably, it has to be something the licensee could address or fix

Examination of applicability to multiple plants: Margin under precipitation and dam failure events

- Calculated margin is based on several prescribed assumptions:
 - Considers largest flood elevation and smallest flood protection elevation available in reviewed NRC documents
 - Not limited to design basis events
 - Does not account for temporary protective measures or operation of submerged components
- Prescribed assumptions are based on observations about Oconee and Fort Calhoun:
 - Reliance on temporary barriers
 - Revised flood estimates that are larger than older estimates
 - Increased estimates of dam failure frequency



This figure answers the question:

What is the "margin" between the highest flood level referred to in available documents and the plant's flood protection level, when not accounting for certain measures that may have been approved during licensing?

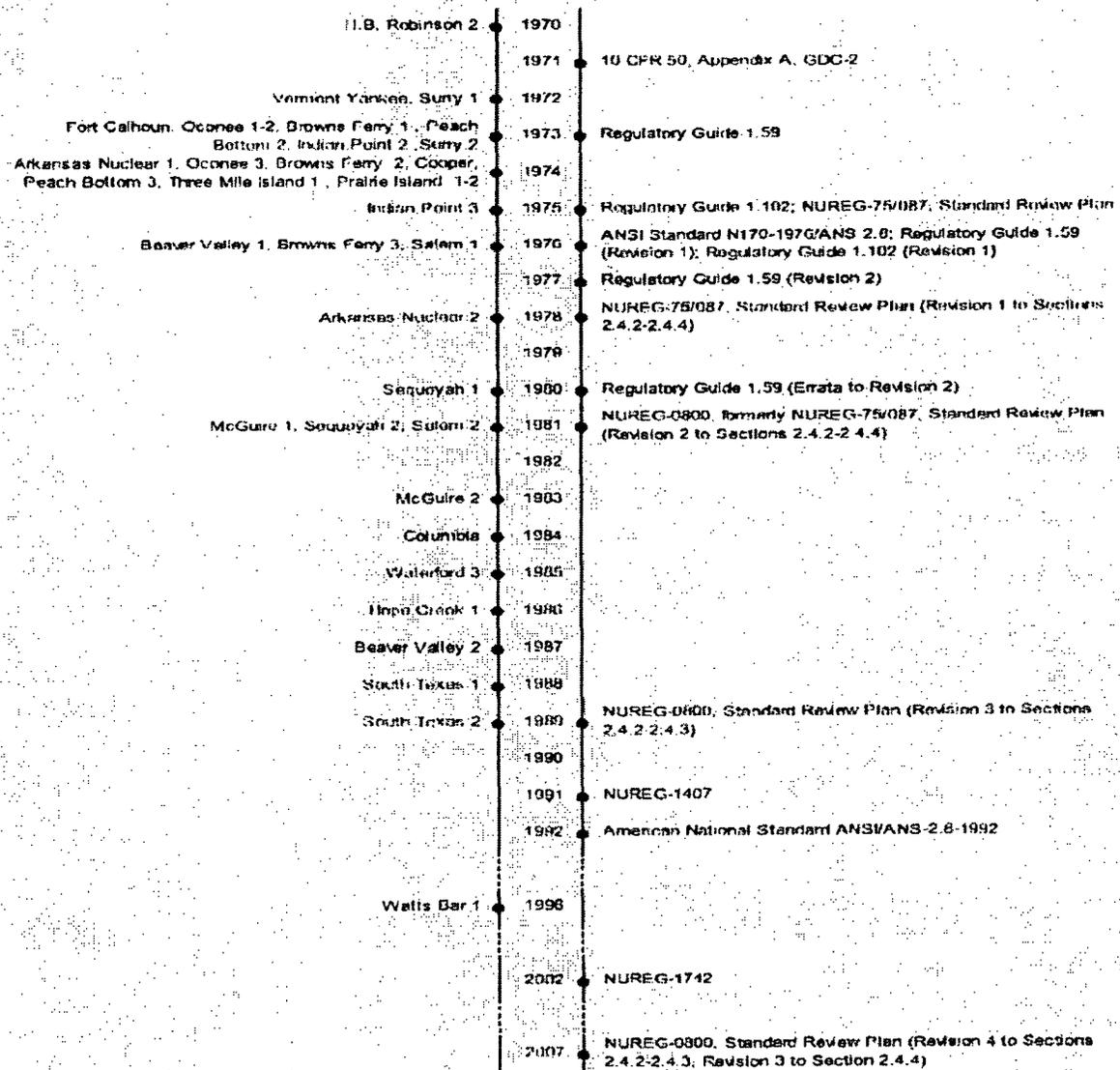
Examination of regulatory history: Operating License Issuance vs. Publication Dates

Key observations:

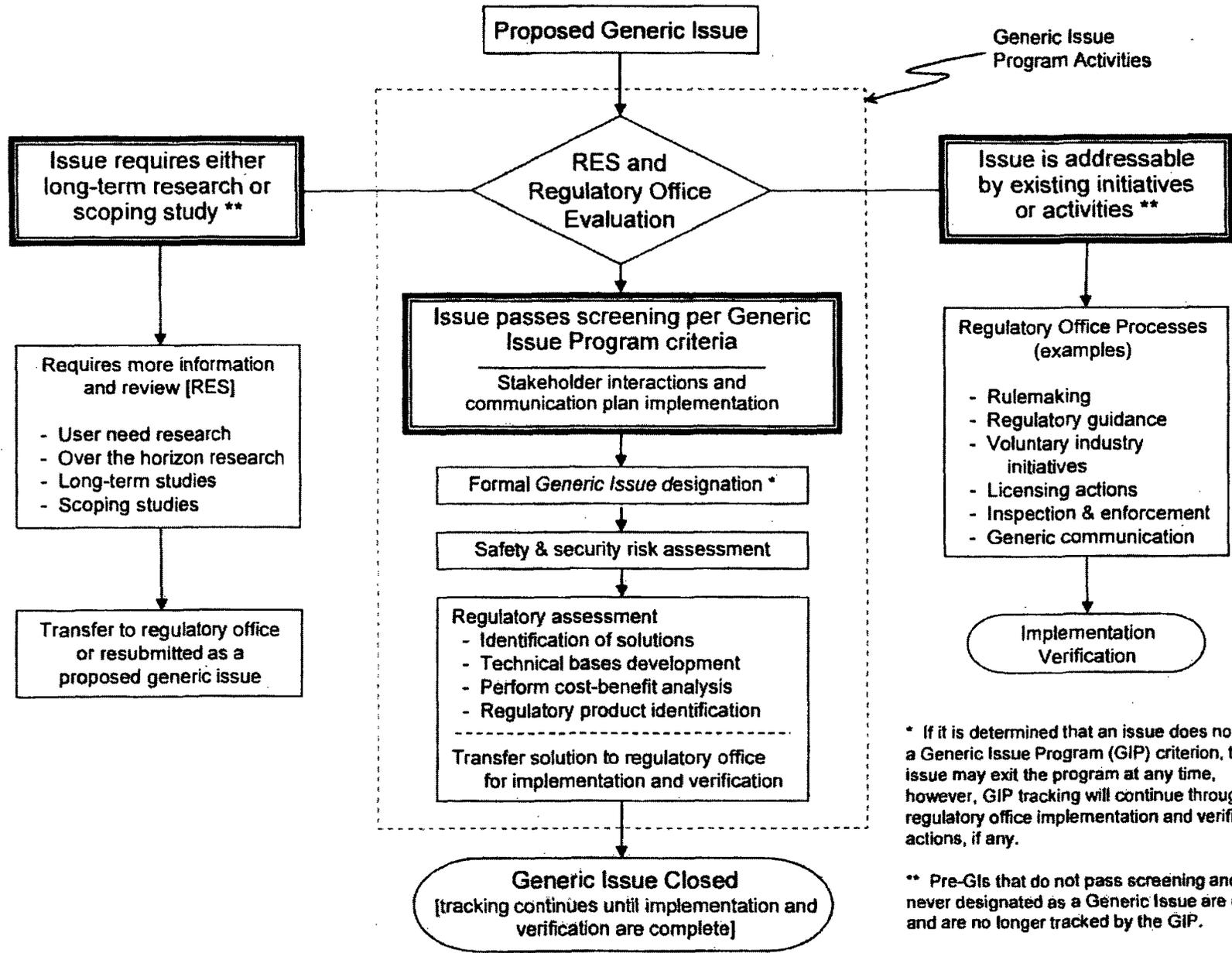
Some plants licensed before key regulatory guidance.

Regulatory guidance related to dam failures has evolved over time.

There is no regulatory requirement to re-assess plants under new/revised guidance.



Generic Issue Program in Perspective With Other Regulatory Programs and Processes



GI-204 Communication Plan

KEY MESSAGES – BACKGROUND – Q&As

You can use this document as a basis for communication with the public

- Widely coordinated throughout NRC
- Represents a coordinated, approved agency opinion

Update Strategy

- Expected to change as our knowledge changes
- Expected to change as the status changes
- We hope to receive comments from the community
- If there is a tough question we have not answered, please let us know

Please review the questions in the Q&A section

The communication plan is not a public document

- Internal coordination tool
- Many communication plans do become public information eventually

Generic Issue #204

Flooding of Nuclear Power Plant Sites Following Upstream Dam Failure

John Kauffman
Richard Perkins

Office of Nuclear Regulatory Research
Division of Risk Analysis
Generic Issues and Operational Experience Branch

Visit our intranet website at
<http://www.internal.nrc.gov/RES/projects/GIP>

Generic Issues Program

- Congressionally mandated
- Agency-wide
- Addresses issues that:
 - Have significant generic implications related to safety or security
 - Cannot be more effectively resolved by other regulatory programs or processes
 - If it involves a new regulatory position, will ultimately need to pass the Backfit Rule, or one of its exceptions

Generic Issue Program Stages

-
- Pre GI
- Identification
 - Acceptance Review
 - Screening
- Generic Issue
- Safety Risk Assessment
 - Regulatory Assessment

What is Special about a Generic Issue?

- “Generic Issue” is a special term, indicating the issue has passed screening against Management Directive 6.4 criteria.
 - Agency consensus
 - Communication Plan
 - Public Meeting
- Tracked until all actions are completed
 - Reported to Congress every six months
 - Reported to NRC management and public every 90 days
- Applicable to new reactors
- Documented in NUREG-0933