

February 27, 2001

Mr. Mike Mulligan  
P. O. Box 161  
5 Wood Lawn Lane  
Hinsdale, NH 03451

Dear Mr. Mulligan:

This letter responds to questions you raised during our telephone conversation on Friday, January 12, 2001 and your e-mail (enclosed) dated January 23, 2001. You raised two basic issues to which I would like to respond.

The first question was what actions, if any, are being taken by the NRC in anticipation of potential problems at nuclear power plants caused by global warming in the coming decades. In relation to this question, you referred me to the national assessment of climate changes that is being carried out under the U.S. Global Change Research Program (USGCRP). You expressed concern that climate changes might put plants outside their design bases, forcing the plants to shut down at a time when their power would be badly needed. You were particularly concerned about plants in the Southeastern United States.

The mission of the NRC is to regulate the nation's civilian use of nuclear materials to ensure adequate protection of public health and safety, to promote the common defense and security, and to protect the environment. For commercial nuclear reactors, this mission includes ensuring that the plants are operated safely and that radiological effluents from the plants are maintained within limits. However, the NRC's mission does not include ensuring that electrical power is available to residential and commercial customers. That responsibility lies with others, including the utilities, the state public utility commissions (or equivalent), and the Federal Energy Regulatory Commission. That is not to say that the NRC is not concerned about issues related to the reliability of electrical power -- we are. But we do not have any regulatory authority in that arena.

However, some of the staff's activities within our regulatory authority may alleviate your concerns. Each nuclear power plant is licensed to operate within its design basis. As I mentioned in my previous letter, if changes (e.g., climate changes) placed the plant outside its design basis, the licensee would have to evaluate the problem and take action to correct it. In addition, on July 18, 1989, the staff issued Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment." Among other things, this generic letter requested licensees to develop a program to periodically test the capacity of the systems used to transfer heat from safety-related loads to the ultimate heat sink.

While this program would ensure that safety-related loads can be cooled, it does not ensure that the plants can operate at full power when summer heat raises the temperature of the non-safety-related cooling systems for the main condenser. However, since global warming is a gradual process, licensees should have adequate time to take actions to mitigate the effects of the climate changes. For example, the licensee for the Dresden nuclear plants recently added cooling towers in response to problems it encountered due to higher temperatures in the canal

that returns the cooling water to the cooling pond. In addition, I contacted the USGCRP to determine if any review had been performed or was planned in this area. Although the impacts of global warming on the energy sector were not included in the current reviews, they are being considered as a future review sector. You may want to express your concerns to USGCRP on their web site ([www.usgcrp.gov](http://www.usgcrp.gov)).

Your second question concerned the testing of plant equipment. In particular you asked why the NRC does not require licensees to test all of their equipment under worst-case conditions. As an example, you questioned why emergency diesel generators are not tested at the maximum outside air temperatures used in the design.

Plant safety equipment is designed to operate under a certain range of conditions. The NRC requires licensees to design this equipment based on the design conditions and to periodically test active components (as opposed to passive components such as static piping supports). While it is desirable to test this equipment under design basis conditions, that is not possible in many cases. For instance, using your example, if the diesel generator is designed to operate at up to 100°F but the outside temperature never actually gets that high, it would be unreasonable to require the licensee to test it at that temperature. Instead, the NRC relies on component designs that include margins, in combination with periodic testing of the equipment at ambient conditions. For the emergency diesel generators, licensees are generally required to run tests on a monthly basis, ensuring that some of the tests will be run during the hottest and coldest months of the year. The staff believes that this approach provides adequate assurance that the equipment will function as-designed if it is called upon in a real event.

I hope that this information addresses your immediate concerns. If you have additional questions, please do not hesitate to contact me at 301-415-2828.

Sincerely,  
/RA/Signed By: AKugler

Andrew Kugler, Senior Project Manager  
Generic Issues, Environmental, Financial,  
and Rulemaking Branch  
Division of Regulatory Improvement Programs  
Office of Nuclear Reactor Regulation

Docket Numbers: 50-321, 50-366

Enclosure: As stated

cc: See attached page

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Andrew Kugler, Senior Project Manager  
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and Rulemaking Branch  
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OFFICE:	RGEB:PM	RGEB:SC	OGC	
NAME:	AKugler	BZalcman	JEuchner*	
DATE:	02/27/01	02/27/01	02/05/01	

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ACRS

A. Kugler

C. Sochor

E-mail:

C. Grimes

C. Carpenter

B. Zalcman

J. Wilson

T. Kenyon

K. Leigh

J. Moore

J. Euchner

F. Cameron

W. Burton

L. Olshan

J. Munday

K. Clark

MA Parkhurst (PNNL; [maryann.parkhurst@pnl.gov](mailto:maryann.parkhurst@pnl.gov))

**From:** "Michael Mulligan" <steamshovel685@earthlink.net>  
**To:** "David N. Pyles" <dnpyles@acousticmusic.com>, <jak...  
**Date:** Tue, Jan 23, 2001 5:01 PM  
**Subject:** Re: Response to your questions

Andy

The implications of this on our electrical infrastructure is staggering with its interaction to the heat sinks; maybe more so the non nuc resources. Fundamentally we will just have to have more capacity (power and transmission), and excess designed plant cooling capacity to compensate for the extremes of summer, winter droughts and floods- mostly in standby and wasted money- than we've had in the past. It's noted that nation wide grid excess capacity margins and maintenance budgets have been declining for a decade now. The interaction with Deregulation and GW is called insanity. According to NOAA's National Ocean Service new report titled, "The Potential Impacts of Climate Change on Coastal and Marine Resources," which speaks of the intercoastal heat up of the Ocean. Of course we've had Oyster Creek, Millstone, Pilgrim, and Vermont Yankee with creeping heat sink temps, low levels and low flows, with teck spec changes that occurred in response to Global Warming already. The NRC has had many documented examples of subtle cooling water component failures and degradation in the peaks of these extremes that have placed plants in an unanalyzed state, and even more of concern it has threatened regional grid reliability. Does it mean we need a higher level of quality of the cooling water systems when we operate near the plant design limits? It's a crying shame, and I've been asking for it for the past few years, that the NRC perform a study on plant events and potential events that have already occurred in the weather extremes. Like at a power ascension program, if the heat sink inlet is at the historic high temp or parameter, how is the public assured that the component would operate with adequate safety margins besides using engineering calculations.? Does the industry have a testing program such that they capture equipment operation at the peak parameters? I thought testing components at its operating limits is the bed rock of public safety. All of the International and National assessments indicated our water resources are going to change drastically within GW Will we be prepared??

Thanks, mike

#### Evidence of Rapid Global Warming Accepted by 99 Nations

SHANGHAI, China, January 22, 2001 (ENS) - The scientific basis for the reality of rapid global warming is clear, a comprehensive new United Nations report reveals. Snow cover has decreased, the duration of lake and river ice cover is shorter, and the atmospheric concentration of heat trapping carbon dioxide has increased by a third since 1750, climate scientists say.

The new assessment by the Intergovernmental Panel on Climate Change projects a "potentially devastating" global warming of 1.4 to 5.8 degrees Celsius (2.52 to 10.44 degrees Fahrenheit) over the coming century. This forecast is for higher temperatures than an assessment by the same panel five years ago.

ENCLOSURE

----- Original Message -----

From: "Andrew Kugler" <AJK1@nrc.gov>

To: <steamshovel685@earthlink.net>

Cc: "Cynthia Sochor" <CSS3.owf4\_po.OWFN\_DO@nrc.gov>

Sent: Tuesday, January 23, 2001 7:38 AM

Subject: Response to your questions

> Mike,

>

> I'm working on the response to the questions you raised during our phone call on Friday, January 12. As I did the last time, I plan to send the answers as a letter from the NRC so that it is available to the public. I'll get it out to you as soon as possible.

>

> Andy

Southern Nuclear Operating Company  
Edwin I. Hatch Nuclear Plant Units 1 and 2

Docket Nos.: 50-321, 50-366

cc:

Mr. D. M. Crowe  
Manager, Licensing  
Southern Nuclear Operating Company Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

Resident Inspector  
Plant Hatch  
11030 Hatch Pkwy N.  
Baxley, GA 31531

Regional Administrator, Region II  
U.S. Nuclear Regulatory Commission  
Atlanta Federal Center  
61 Forsyth St., SW, Ste 23T85  
Atlanta, GA 30303

Mr. Charles H. Badger  
Office of Planning and Budget  
Room 610  
270 Washington St., SW  
Atlanta, GA 30334

Harold Reheis, Director  
Department of Natural Resources  
205 Butler St. S.E., Ste 1252  
Atlanta, GA 30334

Steven M. Jackson  
Senior Engineer-Power Supply  
Municipal Electric Authority of Georgia  
1470 Riveredge Pky, N.E.  
Atlanta, GA 30328-4684

Mr. Douglas J. Walters  
Nuclear Energy Institute  
1776 I Street, NW  
Washington, D.C. 20006

Stan Blanton, Esq.  
Balch and Bingham  
P.O. Box 306  
Birmingham, AL 35201

Mary Jane Wilmoth, Esq.  
National Whistleblower Legal Defense  
and Education Fund  
3238 P St., NW  
Washington, DC 20007-2756

Alice Coleman  
Appling County Public Library  
242 East Parker St.  
Baxley, GA 31513

Chairman  
Appling County Commissioners  
County Courthouse  
Baxley, GA 31531

Mr. J. D. Woodard  
Executive Vice President  
Southern Nuclear Operating Company, Inc.  
P. O. Box 1295  
Birmingham, AL 35201-1295

P. W. Wells, General Manager  
Edwin I. Hatch Nuclear Plant  
Southern Nuclear Operating Company, Inc.  
U.S. Hwy 1 North  
P.O. Box 2010  
Baxley, GA 31515

Mr. R. D. Barker  
Program Manager  
Fossil & Nuclear Operations  
Oglethorpe Power Corporation  
2100 East Exchange Place  
P.O. Box 1349  
Tucker, GA 30085-1349

Charles A. Patrizia, Esq.  
Paul, Hastings, Janofsky & Walker  
10th Floor  
1299 Pennsylvania Ave  
Washington, DC 20004-9500

Mr. Ray Baker  
Hatch License Renewal Project Manager  
Southern Nuclear Operating Company, Inc.  
PO Box 1295  
Birmingham, AL 35201-1295

Mr. C. R. Pierce  
Manager, Nuclear Operating Company  
40 Inverness Center Parkway  
P.O. Box 1295  
Birmingham, AL 35201-1295

Mr. Mark Bowers  
U.S. Fish and Wildlife Services  
718 Round Oak-Juliette Road  
Round Oak, GA 31038

Mr. Bert Deener  
Georgia Department of Natural Resources  
Wildlife Resources Division  
Fisheries Management Section  
108 Darling Ave.  
P.O. Box 2089  
Waycross, GA 31502-2089

Mr. Greg Masson  
U.S. Fish and Wildlife Services  
Ecological Services Field Office  
4270 Norwich Street  
Brunswick, GA 31520-2521

W.M. Winn, Director  
Georgia Department of Natural Resources  
Environmental Protection Division  
Water Protection Branch  
4220 International Pwky., Ste 101  
Atlanta, GA 30354

David Walter  
Georgia Department of Natural Resources  
Wildlife Resources Division  
2070 U.S. Hwy 278,  
Social Circle, GA 30025

W. Ray Luce, Director and Deputy State  
Historical Preservation Officer  
Georgia Department of Natural Resources  
Historic Preservation Division  
500 Healey Bldg.  
57 Forsyth St., N.W.  
Atlanta, GA 30303

Charles Oravetz, Chief  
Protected Species Branch  
National Marine Fisheries Service  
9721 Executive Center Dr. North  
St. Petersburg, FL 33702

David Bernhart, Fishery Biologist  
National Marine Fisheries Service  
9721 Executive Center Dr. North  
St. Petersburg, FL 33702

Sandra Tucker, Field Supervisor  
U.S. Fish and Wildlife Services  
Ecological Services Field Office  
247 South Milledge Ave.  
Athens, GA 30605

Otha Dixon  
Holiday Inn Express  
2619 E. 1<sup>st</sup> St.  
Vidalia, GA 30474

George Dickens  
Development Authority  
P.O. Box 536  
Hazlehurst, GA 31539

Cathy Meehan  
Southeastern Technical Institute  
3001 E. 1<sup>st</sup> St.  
Vidalia, GA 30474

Duane Whitley  
Appling County Commission Chariman  
P.O. Box 2  
Baxley, GA 31515



Lewis Parker  
 Sheriff  
 Appling County Sheriff's Office  
 Court House Sq.  
 Baxley, GA 31513

J. Edward Tyson  
 Darby Bank & Trust Company  
 1404 Barron St.  
 Vidalia, GA 30474

Karon Durden  
 United Way  
 Vidalia Onion Festival  
 2004 Chevy Place  
 Vidalia, GA 30474

Dale Adkins  
 Appling County Development Authority  
 P.O. Box 710  
 Baxley, GA 31513

Jeff Baxley, City Manager  
 City of Baxley  
 P.O. Box 290  
 Baxley, GA 31513

Pamela Blockey O'Brien  
 D23 Golden Valley  
 Douglasville, GA 30134

Rita Kilpatrick  
 Georgians for Clean Energy  
 427 Moreland Ave., Ste 100  
 Atlanta, GA 30307

Laurence M. Bergen  
 Oglethorpe Power Corporation  
 3420 Greenside Ct.  
 Dacula, GA 30019

Jan Kozyra  
 868 Ivanhoe Dr.  
 Florence, SC 29505

Roger Byrd  
 State Representative  
 P.O. Box 756  
 Hazlehurst, GA 31539

Gary G. Drury  
 Georgia Coast Watch  
 Route 9, Box 281  
 St. Simons Island, GA 31522

Mayor Steve Rigdon  
 194 Stephens Ave.  
 Baxley, GA 31513

Phil Proctor  
 1907 O'Neal Cir.  
 Vidalia, GA 30474

Deborah Sheppard  
 Altamaha Riverkeeper  
 P.O. Box 2642  
 Darien, GA 31305

Mike Cleland  
 County Manager  
 Appling County  
 83 S. Oak St.  
 Baxley, GA 31513

Ross C. Kist III  
 Municipal Electric Authority of Georgia  
 1470 Riveredge Pwky NW  
 Atlanta, GA 30328-4686

Ralph Beedle, Sr. Vice President  
 and Chief Nuclear Officer  
 Nuclear Energy Institute  
 1776 I Street NW, Ste. 400  
 Washington, DC 20006

Tony Banks  
 Virginia Power  
 Innsbrook Technical Center  
 500 Dominion Blvd.  
 Glen Allen, VA 23060

Dennis Capella  
PECO Energy Co.  
2301 Market St.  
Philadelphia, PA 19101

Bill Maher  
PECO  
965 Chesterbrook Blvd.  
M/C 63A-3  
Wayne, PA 19087-5691

Marty Ray  
Tetra Tech, NUS  
900 Trailridge Rd.  
Aiken, SC 29803

Bill Slocumb  
GA DNR/EPD  
4244 International Pwky., Ste. 114  
Atlanta, GA 30354

Richard R. Zuercher  
Dominion Energy  
5000 Dominion Blvd., 2 SE  
Glen Allen, VA 23060

Kathy Bradford  
Advance Progress  
P.O. Box 669  
Vidalia, GA 30475

Christi Hardin  
Georgia Power Company  
11036 Hatch Pwky  
Baxley, GA 31513

Doug Shaw  
The Nature Conservancy  
P.O. Box 484  
Darian, GA 31305

Philip Moore  
Tetra Tech  
900 Trail Ridge Rd.  
Aiken, SC 29803

Julea Hovey  
Constellation Nuclear Services  
1359 Silver Bluff Rd., Ste. G-17  
Aiken, SC 29803

Karen Patterson  
Tetra Tech, NUS  
900 Trail Ridge  
Aiken, SC 29803

Barty Simontar  
GA DNR/EPD  
4244 International Pwky, Ste., 114  
Atlanta, GA 30354

Mike Whitten  
Tetra Tech, NUS  
900 Trail Ridge Rd.  
Aiken, SC 29803

William Bleck  
Box 1188  
Baxley, GA 31515

Patricia Dixin  
United Way  
P.O. Box 352  
Vidalia, GA 30474

Cole Lindell  
MEAG Power  
P.O. Box 1600  
Waynesboro, GA 30830

Jerry Strickland  
Sun Trust Bank  
420 Satilla Ch. Rd. SE  
Baxley, GA 31513

Calvin K. Bobbitt  
511 Bay St.  
Vidalia, GA 30474-5303

Stephen Summer  
SC Electric & Gas Co.  
6248 Bush River Rd.  
Columbia, SC 29212

David Lochbaum  
 Union of Concerned Scientists  
 1707 H St., NW, Suite 600  
 Washington, DC 20006-3919

Jeffrey Stair  
 Georgia Public Service Commission  
 47 Trinity Avenue  
 Atlanta, GA 30334

The Honorable Cynthia A. McKinney  
 Attn: Mr. E. Lausten, Constituent Services  
 Representative  
 246 Sycamore St. Suite 110  
 Decatur, GA 30030

Mr. Heinz Mueller  
 Chief, NEPA Compliance Branch  
 U.S. Environmental Protection Agency  
 Region IV  
 61 Forsythe St.  
 Atlanta, GA 30303

Sara Barczak  
 Georgians for Clean Energy  
 3025 Bull Street, Suite 101  
 Savannah, GA 31405

Mr. Mike Mulligan  
 PO 161  
 5 Wood Lawn Lane  
 Hinsdale, NH 03451

Dusty & Wright Gres  
 1100 Deen Landing Road  
 Baxley, GA 31513

Janisse Ray  
 604 Hilton Baxley Road  
 Baxley, GA 31513

Daniel Bowen  
 2000 Sawmill Road  
 Ailey, GA 30410

Dane Bruce  
 Appling County EMA  
 P.O. Box 747  
 Baxley, GA 31515

Zack Fouler  
 Vidalia Communications  
 P.O. Box 900  
 Vidalia, GA 30475

Jim Hardeman  
 Georgia Dept. of Natural Resources  
 Emergency Planning Division  
 4244 International Pkwy, Suite 114  
 Atlanta, GA 30354

Ronald E. Widener  
 Toombs County EMA  
 P.O. Box 487  
 Lyons, GA 30436

Charles Wilson  
 Tennessee Valley Authority  
 P.O. Box 236542  
 Chattanooga, TN 37422

Dusty Gres  
 Ohoopee Regional Library System  
 610 Jackson Street  
 Vidalia, GA 30474

David Kyler, Executive Director  
 Center for a Sustainable Coast  
 P.O. Box 598  
 Darien, GA 31305

Joan O. King  
 304 Manor Drive  
 Sautee, GA 30571

Merriam A. Bass  
 M.K. Pentecost Ecology Trust Fund  
 3590 Darien Highway, Suite 8  
 Brunswick, GA 31525