

**OVERSIGHT HEARING: NRC'S IMPLEMENTATION
OF RECOMMENDATIONS FOR ENHANCING NU-
CLEAR REACTOR SAFETY IN THE 21ST CEN-
TURY**

JOINT HEARING
BEFORE THE
SUBCOMMITTEE ON CLEAN AIR
AND NUCLEAR SAFETY
AND THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
ONE HUNDRED TWELFTH CONGRESS
SECOND SESSION

SEPTEMBER 12, 2012

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ONE HUNDRED TWELFTH CONGRESS
SECOND SESSION

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C O N T E N T S

	Page
SEPTEMBER 12, 2012	
OPENING STATEMENTS	
Boxer, Hon. Barbara, U.S. Senator from the State of California	1
Inhofe, Hon. James M., U.S. Senator from the State of Oklahoma	3
Lautenberg, Hon. Frank R., U.S. Senator from the State of New Jersey	4
Alexander, Hon. Lamar, U.S. Senator from the State of Tennessee	5
Carper, Hon. Thomas R., U.S. Senator from the State of Delaware	7
Barrasso, Hon. John, U.S. Senator from the State of Wyoming	9
WITNESSES	
Macfarlane, Hon. Allison M., Chairman, U.S. Nuclear Regulatory Commission	10
Prepared statement	13
Responses to additional questions from:	
Senator Boxer	21
Senator Carper	42
Senator Inhofe	45
Svinicki, Hon. Kristine L., Commissioner, U.S. Nuclear Regulatory Commission	68
Responses to additional questions from:	
Senator Boxer	69
Senator Inhofe	72
Apostolakis, Hon. George, Commissioner, U.S. Nuclear Regulatory Commission	76
Magwood, Hon. William D., IV, Commissioner, U.S. Nuclear Regulatory Commission	77
Responses to additional questions from:	
Senator Boxer	79
Senator Inhofe	84
Ostendorff, Hon. William C., Commissioner, U.S. Nuclear Regulatory Commission	89

**OVERSIGHT HEARING: NRC'S IMPLEMENTA-
TION OF RECOMMENDATIONS FOR EN-
HANCING NUCLEAR REACTOR SAFETY IN
THE 21ST CENTURY**

WEDNESDAY, SEPTEMBER 12, 2012

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
JOINT WITH THE SUBCOMMITTEE ON CLEAN AIR
AND NUCLEAR SAFETY
Washington, DC.

The Committee met, pursuant to notice, at 10 a.m. in room 406, Dirksen Senate Office Building, Hon. Barbara Boxer (Chairman of the Committee) presiding.

Present: Senators Boxer, Inhofe, Lautenberg, Carper, Cardin, Alexander, and Barrasso.

**OPENING STATEMENT OF HON. BARBARA BOXER,
U.S. SENATOR FROM THE STATE OF CALIFORNIA**

Senator BOXER. The meeting will come to order.

What I want to do right before we start is to have a moment of silence for our Ambassador to Libya who was killed and three other Foreign Service officers. We know that our military and our Foreign Service officers put their lives on the line every single day. So let's take one moment.

[Moment of silence.]

Senator BOXER. Today the Environment and Public Works Committee is holding its seventh oversight meeting on the Nuclear Regulatory Commission since the earthquake, tsunami, and nuclear meltdown in Japan in March 2011. The consequences of those terrible events have prompted us to rethink how to ensure safety at the 104 nuclear reactors in the United States.

Last year the NRC created a task force to review our nation's safety requirements. And that task force made 12 recommendations to help prevent a similar disaster at nuclear facilities in the U.S. Earlier this year the NRC sent three orders to nuclear plants requiring high priority safety improvements, the acquisition and protection of emergency equipment, better monitoring of spent fuel pools, and improved venting at boiling water reactors to help maintain containment in the case of an emergency.

The NRC also directed nuclear plants to take other actions, including reanalyzing earthquake and flooding risks and re-assessing their ability to safely operate following such events. In addition, the Commission issued two notices of proposed rulemaking, one

concerning steps plants should take if they lose electric power and the other on ways to improve nuclear plants' emergency procedures.

While on the one hand I am encouraged that the NRC has begun moving forward, I also have concerns that the Commission is allowing some nuclear plants to delay implementing safety improvements beyond the recommended 5-year period. Public safety of nuclear facilities must be the NRC's top priority, and I call on this Commission to ensure that the recommended improvements are put in place within the next 5 years. I intend to do my best on this Committee to make certain that these safety upgrades are completed without delay.

I also want to talk about an urgent matter in my home State of California that is extremely close to my heart. The San Onofre Nuclear Generating Station is located near San Clemente, and 8.7 million people live within 50 miles of that site. This nuclear plant, which is currently offline, has experienced unexpected deterioration with the tubes that carry radioactive water in the plant's new steam generators. This situation could pose health and safety risks, because if those tubes leak or rupture, they could release radiation at levels that exceed safety standards.

I am pleased that the NRC has undertaken an investigation regarding the problems at San Onofre. Today I want to make certain—and I will be asking all of you—I want to make certain that the Commission continues to pay serious attention to this nuclear facility. Let me be clear: it is your duty to ensure that the appropriate actions are taken to address safety concerns related to the compromised tubes before San Onofre's reactors are permitted to go back online. The San Onofre reactors must not be restarted until the NRC's investigation is completed and the public has been assured of the plant's safety.

The NRC was created "to ensure the safe use of radioactive materials while protecting people and the environment." The millions of people who live near San Onofre deserve to have peace of mind.

It is critical that the NRC conduct this investigation at San Onofre in an open and transparent way. I am very pleased that the Commission has scheduled a public meeting in California in October. Today I want assurances that this meeting is on track and will take place.

I also want to remind the Commissioners sitting here today about their commitments to me that the NRC will determine whether SoCal Edison was in full compliance with the regulations regarding the redesigned steam generators. We also need to evaluate whether the NRC regulations should be changed to avoid a similar situation in the future.

I will continue to work with the NRC to ensure safety issues at San Onofre and other plants across the nation. I do look forward to hearing from the Commissioners about the progress that has been made to implement safety changes resulting from the lessons learned from Fukushima.

Before turning to Ranking Member Inhofe for his opening statement, I would like to say a special welcome to Dr. Allison Macfarlane, who is testifying before this Committee for the very first time as the new NRC Chairman. We welcome you.

And now I turn to Senator Inhofe.

**OPENING STATEMENT OF HON. JAMES M. INHOFE,
U.S. SENATOR FROM THE STATE OF OKLAHOMA**

Senator INHOFE. Thank you, Madam Chair. Let me apologize to our five guests that I will have to be leaving right after my opening statement because of a commitment that I have. But I am very excited to see all five faces in front of us now in a spirit of collegiality that I think has been needed. We are looking forward to working with you, particularly Chairwoman Allison Macfarlane. I am just very excited to have you, and of course you, too, Ms. Svinicki.

Right now, we have been pretty busy over the last year. And for the first time in some 30 years now, new licenses to build two reactors were issued by the Commission. So good things are happening. When you look at the concern people have about our ability to produce our own energy in this country, recognizing the fact that we have the largest recoverable reserves in coal, oil, and gas, it is something where we can see the day when we are not going to have this reliance, whether it is Hugo Chavez or the Middle East.

Then of course, nuclear has to be a part of it, and it is going to be a very significant part of it. I am very excited to see what we are going to be doing. So between nuclear, oil, gas, coal, hydro power, and renewable, we are going to do great things.

Ensuring the safe use of nuclear energy is a very serious job. That is why unlike many countries, way back in the 1970s, Congress established the NRC, the independent commission, and charged five Commissioners with the responsibility to protect the public health and safety. We saw what happened at Fukushima. We are all committed to ensuring that the United States nuclear power plants will not experience a similar accident.

That is why we have safeguards in place that would have prevented such a disaster here in the United States. For example, the Fukushima nuclear accident independent investigation committee formed by the Japanese government reported that the Japanese plants are not required to consider a possible station blackout scenario, something the NRC instituted here in the United States way back in the 1980s. This report concluded that "The accident may have been preventable" if an order already required by the NRC following the September 11th terrorist attack was instituted in Japan.

So to all the Commissioners and the new Chairman, I am pleased to see what is going to be happening here. We are looking forward to great things. And we are going to continue to have, through our Subcommittee, oversight hearings to be sure we stay on the schedule that we commit to. I always remember actually back when Republicans were majority and I chaired that Nuclear Subcommittee, at that time, we had not had an oversight hearing in some 5 years. And oddly enough, it was the members of the NRC that wanted oversight hearings. So we're going to be able to do that, work together and make nuclear a very important part of our energy package.

Thank you, Madam Chairman.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE,
U.S. SENATOR FROM THE STATE OF OKLAHOMA

Thank you, Chairman Boxer, for holding this hearing and focusing on implementing the lessons learned from Fukushima. The efforts will ensure that the safety of nuclear plants in the U.S.—and around the world—will be enhanced and the use of nuclear energy will be sustained over the long term.

First, I would like to welcome Chairwoman Macfarlane to the Nuclear Regulatory Commission (NRC) and welcome her to the EPW hearing room in her new, official capacity. You have big challenges ahead, and everyone here on this Committee has high hopes that you will be able to restore the collegial working environment at the Commission.

The NRC has been busy over the past year. For the first time in over 30 years, new licenses to build two reactors were issued by the Commission. In March the Commission issued orders to implement the most significant post-Fukushima improvements. I am pleased that under Chairwoman Macfarlane the Commission is focusing on its mission of nuclear safety without unnecessary distractions.

Our country needs affordable energy for any sustained economic growth. As a nation, we have the ability to produce this energy domestically, but nuclear must have a seat at the table for an all of the above energy policy that includes oil, gas, coal, hydropower, and renewable energy.

Ensuring the safe use of nuclear energy is a very serious job. That is why, unlike many other countries, Congress established the NRC, an independent commission, and charged five commissioners with the responsibility to protect public health and safety. We saw what happened at Fukushima, and we are all committed to ensuring that a United States nuclear power plant will not experience a similar accident. That is why we have safeguards in place that would have prevented such a disaster here in the United States. For instance, the Fukushima Nuclear Accident Independent Investigation Commission (formed by the Japanese government) reported that the Japanese plants are not required to consider a possible station blackout scenario—something the NRC instituted in the 1980s. This report concluded that “the accident may have been preventable” if an order already required by the NRC following the September 11, 2001, terrorist attacks on the U.S. was instituted by the Japanese.

No one—on either side of the aisle—in Congress is willing to accept anything other than the safe operation and regulatory compliance of the country’s commercial nuclear power plants. Throughout the NRC’s history, we have applied lessons learned from nuclear and non-nuclear events. At the same time, the NRC has the vital responsibility to determine the cumulative effects that its regulations actually have on safety. It is important that regulations provide significant, tangible, and necessary safety benefits that warrant the costs—costs that are ultimately borne by consumers.

To all of the Commissioners, and the new Chairman, I am pleased to see that debates and the free flow of information seem healthy and respectful again. Combined, your actions are critical to ensure the safe operation of the nuclear power plants across this country. The nation is also counting on you to prevent the imposition of an unpredictable or unnecessary regulatory burden that undermines nuclear energy economically, and avoid the way EPA regulations are driving the premature shutdown of coal-fired power plants.

It can continue to be a new day for the NRC, and it is up to you to uphold the NRC’s reputation for reasoned and balanced regulation.

Senator BOXER. Thank you very much, Senator. And we will miss you.

Senator Lautenberg.

**OPENING STATEMENT OF HON. FRANK R. LAUTENBERG,
U.S. SENATOR FROM THE STATE OF NEW JERSEY**

Senator LAUTENBERG. Thank you, Madam Chairman.

Nuclear energy is critical to meeting our nation’s energy needs. An emissions-free energy source, now providing one-fifth of America’s electricity. In New Jersey, our four nuclear power reactors provide our State with more than half of its electricity.

But as we saw with the disaster in Japan last year, there are also many reasons for caution. The crisis in Japan left every Amer-

ican concerned: could it happen here? The Nuclear Regulatory Commission's Task Force studied this situation closely and determined that our nuclear facilities pose no imminent threat to the American people. While this is reassuring news, it was also clear that we needed to do more to improve nuclear safety here.

The NRC's Task Force issued 12 recommendations to strengthen nuclear preparedness and protect plants when earthquakes and other natural disasters occur. Since they issued these recommendations, the Commission has taken real steps to ensure our reactors are more secure.

But some have raised concerns that we must do more and move more quickly. Let me be clear: when it comes to safety, we all agree that we cannot afford unnecessary delays. In addition to operating plants safely, the United States needs to have an effective policy—which I know that you are working on—for disposing and storing spent nuclear fuel. Right now, most nuclear power plants store more than 1,000 tons of nuclear waste in spent fuel pools onsite. Not a sustainable position.

At New Jersey's reactors, nuclear waste is stored onsite. Some of it is in dry cask storage and some in spent fuel pools, which rely on a steady supply of water and electricity. In Japan, when the earthquake and tsunami knocked the power out, we saw rescue workers desperately spraying water from fire hoses into the spent fuel pools. More than a year later, there are still serious concerns about the safety of spent fuel at Fukushima.

One thing is clear: we have to find a better and safer way to store nuclear waste, to ensure that a disaster like the one that took place in Japan never happens here. It means finding more secure ways to store fuel onsite, finding agreeable places to store national spent fuel, and making certain that these sites have long-term viability. Nuclear power must be part of our energy future.

But the disaster in Japan has taught us that nothing can be taken for granted where nuclear power is concerned. Japan's leaders believed the Fukushima plant was strong enough to withstand a worst case scenario. But as we now know, it wasn't. Likewise, going back years, Chernobyl taught us that the effects of a single nuclear accident can linger for generations. We have to learn from these lessons, learn from other mistakes. I thank the Commissioners—you do a good job—for coming today to testify. I am eager to hear about the NRC's ongoing efforts.

Thank you, Madam Chairman.

Senator BOXER. Thank you, Senator Lautenberg.

And it is Senator Alexander next.

**OPENING STATEMENT OF HON. LAMAR ALEXANDER,
U.S. SENATOR FROM THE STATE OF TENNESSEE**

Senator ALEXANDER. Thanks, Madam Chairman.

Madam Chairman, thank you for holding this hearing. My view is that the more the American people hear about and know about nuclear power, the more confident they will be in the system that we have. So I welcome our Commissioners and am glad you are here.

Several Senators visited Germany and Sweden over the last few days. It made me grateful that we have, as Senator Lautenberg

said, 20 percent of our electricity produced by nuclear power and 70 percent of our emissions-free electricity produced by nuclear power. It is done in historically a safe way.

The reason these hearings are important is the production of energy by nuclear power has been our safest method of energy production, but it is complex. And people need to know what we're doing and understand what we're doing.

The lessons that we received in Sweden and Germany are instructive to us. Sweden on one hand, half their power is nuclear. Half their power is hydro. So they have absolutely clean electricity. And they have cheap electricity. And they have a repository which the communities in Sweden competed to win, and there is a picture of the mayor who won with a happy face and the mayor who lost with an unhappy face. So we could learn from Sweden.

Germany, right next door, has an energy mess on its hands. They are closing their nuclear power plants. They are still buying nuclear energy from France, so that they will have enough energy, electricity for their big industrial state. They are building coal plants, and they are building gas plants, even though gas in Europe costs four or five times what it costs here. And one reason they are building gas plants is to have electricity when the windmills don't blow, which makes you wonder, well, why do you have windmills if you are going to build gas plants.

So their officials told us that if you want cheap energy, don't come to Germany. So you can go to Sweden, or you can come to the United States, where we have a mixture of energy and a pretty good energy policy, I would say, based upon the free market with environmental regulations amended to that, which are producing right now a lot of reliable, low cost, cheap electricity and energy. That is a great boon to job growth over the future.

So your job, making sure that our 104 reactors continue to operate well and safely, is important.

In another hearing today, Senator Bingaman is introducing a bill to help us find a long-term repository for nuclear spent—for used fuel. We need to do that. Senator Feinstein and I, Senator Murkowski, and Senator Bingaman have been working this year to do it. We have made a lot of progress; we have a little difference, the three of us do, with Senator Bingaman on exactly one or two provisions of his legislation.

But whether you are for Yucca Mountain or against Yucca Mountain, we need a new repository. Because if we took all the stuff we have today at our 104 sites and put it at Yucca Mountain, it would nearly fill it up. So we need consolidation sites, especially Senator Boxer, for plants that might already be closed. We could move the fuel from there. And we need a long-term repository.

So I hope this Commission will continue to make that a top priority as we work together with the Congress and the Administration to move ahead on parallel tracks to find consolidation sites for spent fuel that is at our nuclear power plants and seeing that it is safe. And the Chairman, the previous Chairman said it would be safe for 100 years there. But that is not where it is supposed to be for 100 years. It is supposed to be in a long-term repository. And as I said, whether you are for or against Yucca Mountain, we need another one and we need consolidation sites.

Finally, I look forward to hearing from you in the question and answer session about your support for innovation and nuclear power. The Congress and the President are supporting small reactors. That is an important part of our ability to have plenty of reliable, clean electricity in the future in this country. We would like to be a leader in that area in the world, first, because it does provide jobs. But second, it simply provides another—perhaps better—way to produce clean electricity that is reliable over time.

And as a good citizen of the world, we have such good safety standards here that if we do a good job with small reactors, those practices will be exported in the world like many of our practices have been for our large reactors and our nuclear reactors on our Navy ships.

So I welcome this, and I thank the Chairman very much for the hearing, and I hope we continue to have them regularly.

Senator BOXER. Thank you so much, Senator, and that would be my intention.

Now we are going to hear from Senator Carper.

**OPENING STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE**

Senator CARPER. Thanks, Madam Chair.

To our Commissioners, welcome. I see broad smiles here before us today, Madam Chairman, and I would say it looks like a friendlier, happier group than I recall gathered before us in the past. So we welcome that as well.

I want to express our thanks to our new Chairman, Chairman Macfarlane, who I believe was sworn into office in July, and to congratulate Commissioner Svinicki, who I believe was sworn in for a second term; was that in July as well? OK, thank you.

Congratulations to both of you. Thanks for your willingness to take on this responsibility and your willingness to extend your stay on this Commission. It is important work, as you know.

Currently, our country has some 104 nuclear power plants operating in I think about 31 States, with an additional 5 that are under construction and will come online, I hope, sometime in the next several years. Collectively, as others have said, these 104 nuclear plants provide about roughly 20 percent of the energy that we use in this country. I think maybe Senator Lautenberg was implying, and some others have said, that that energy comes with some special benefits. One, no carbon dioxide emissions; two, no sulfur dioxide emissions; three, no mercury emissions. And that is good; that is really good. We need to keep that in mind.

But the energy from all those plants has helped to curb our nation's reliance on fossil fuels, and it has helped reduce our air pollution and the damages it causes to health and global warming. We are especially mindful of that, Senator Lautenberg and I are, and Senator Cardin, as downwind States from all that pollution that is put up in the Midwest and just blows our way and fouls our air. And frankly, there is not a lot we can do just by our own about it. But nuclear energy helps relieve that.

But as far as the benefits of nuclear power, we have seen from the crisis at the Japanese Fukushima Daiichi district, the damage that nuclear power can cause if not properly regulated. Safety must

always be our top priority when it comes to nuclear energy. That is why the Fukushima accident and before, this Committee has exercised its oversight repeatedly, as Senator Inhofe has suggested, to ensure that our nation's nuclear power plants are prepared for the worst. We want to make sure that our nuclear power plants can respond effectively in any crisis to protect the American public.

I was reassured when the NRC concluded that an accident like Fukushima is unlikely to happen in the United States and that our nuclear fleet poses no imminent risk to public safety. This is due in part to the diligence of the NRC to public safety. But as my colleagues have heard me say over and over and over and over again, if it isn't perfect, make it better. And since our hearing last March, the NRC has required the implementation of several actions at our nuclear power plants in light of the lessons learned from Fukushima. The NRC has also required nuclear power plants to investigate and report back ways we can further enhance flood and earthquake protection at our 104 reactors.

Today we look forward to hearing an update from the NRC Commissioners regarding their practice and progress. I sincerely hope that the Commission will continue to have a dialogue with key stakeholders and seek public input from all sides of these issues as the recommendations are being implemented. However, I will be very disappointed if by the second anniversary of the Fukushima accident, which will be, I believe, March 11th, 2013, our nuclear power plants are not where they are supposed to be according to the schedule the Commission has laid out.

As I continue to support the pursuit of raw, clean energy—all clean energy—our top priority for domestic nuclear power industry remains public safety. We all know that we can do better. And that is the responsibility that this Committee shares with you.

The NRC is moving forward to ensure that the U.S. nuclear industry continues to improve its safety and preparedness efforts. Part of that job, our job, is to make sure that that happens.

Thank you, Madam Chair.

And again, welcome.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE

Let me begin by welcoming back the Nuclear Regulatory Commission's (NRC's) Commissioners to our Committee. I appreciate you taking the time to be before us today. In particular, I want to welcome Chairman Macfarlane who was sworn into office last July. This is her first appearance before this Committee as Chairman of the NRC. Welcome.

Currently, our country has 104 nuclear power reactors operating in 31 States, with an additional 5 that are under construction and that will come online, hopefully, within the next several years. Collectively, these nuclear power plants generate approximately 20 percent of our nation's total electric consumption.

The energy from these nuclear power plants has helped curb our nation's reliance on dirty fossil fuels and has helped reduce our air pollution that damages health and causes global warming. Despite the benefits of nuclear power, we have seen from the crisis at the Japanese Fukushima Daiichi facility the damage that nuclear power can cause if not properly regulated.

Safety must always be our top priority when it comes to nuclear energy. That is why since the Fukushima accident—and before—this Committee has exercised its oversight authority repeatedly to ensure that our nation's nuclear power plants are prepared for the worst. We want to make sure that our nuclear power plants can respond effectively in any crisis to protect the American public.

I was reassured when the NRC concluded that an accident like Fukushima is unlikely to happen in the United States and that our nuclear fleet poses no imminent risk to public safety. This is due in part to the due diligence of the NRC to public safety. But as my colleagues have heard me say over and over, if it is not perfect, make it better.

Since our hearing last March, the NRC has required the implementation of several safety actions at our nuclear power plants in light of the lessons learned from Fukushima. The NRC has also required our nuclear power plants to investigate and report back ways we can further enhance flood and earthquake protections at our 104 reactors. Today, I look forward to hearing an update from the NRC Commissioners regarding their progress.

I sincerely hope the Commission will continue to talk to stakeholders and get public reaction—from all sides of these issues—as the recommendations are being implemented. However, I will be very disappointed if by the second anniversary of the Fukushima accident—which will be March 11, 2013—our nuclear power plants are not where they are supposed to be according to the schedule the Commission has laid out.

As I continue to support the pursuit of all clean energy, my top priority for our domestic nuclear power industry remains public safety. We all know we can do better, and the NRC is moving forward to ensure that the U.S. nuclear industry continues to improve its safety and preparedness efforts.

Senator BOXER. Thank you.

I am going to call on Senator Barrasso, but before I do, I want to apologize, it was so very warm in here. We have had issues this morning. So without having a Commission meeting, I opened up all the doors. And I think it is feeling better. There must be a message in that, but we will figure it out.

Senator Barrasso.

**OPENING STATEMENT OF HON. JOHN BARRASSO,
U.S. SENATOR FROM THE STATE OF WYOMING**

Senator BARRASSO. Thank you, Madam Chairman. I would also like to thank and welcome all the Commissioners here today.

According to the Department of Energy, nuclear power provided about 19 percent of total U.S. utility scale electricity last year. The Department of Energy projects that America needs 40 to 50 large nuclear plants to be built and start operating within the next 20 years for nuclear power to maintain or increase its share of the U.S. electricity supply.

The fact is, we need to maintain and improve our nuclear industry. The only way we can do that is to promote responsible policies and regulations that protect public safety while maintaining nuclear share of our electricity output. We need to make America's nuclear reactors as safe as we can as feasibly as we can, while growing this important energy source. After the nuclear disaster at Fukushima, the American people want to know that nuclear safety is improved. The American people want us to ensure that there will not be a repeat of such a disaster in Japan here in the United States, that communities across America are safe from harm, that the Nuclear Regulatory Commission is tasked with protecting us. It is not a responsibility, I know, that any of you are taking lightly.

The incident at Fukushima has led to a process at NRC of developing recommendations to improve nuclear safety here in the United States. The Commission has decided upon those recommendations that are most significant, that has established a path that leads to timely implementation. Now it is incumbent upon the Commission to ensure that those who must implement

those recommendations are able to do so without impeding the growth of much needed nuclear power.

A good step toward that goal is that the Commission appears to be regaining some measure of collegiality and strength lost during the reign of the previous Chairman. As many of you know, the President's former Chairman resigned under fire. As a result, the Commission must now improve the process of permitting and licensing of nuclear power plants, a process the former Chairman slowed down by so frequently disagreeing with the bipartisan majority of Commissioners.

Having turned the page with new leadership, the Commission must stick to its convictions so that the so-called Tier One recommendations be properly implemented. The Commission should not be distracted by the desires of some who wish to drive the resolution of all recommendations to suit an artificially established deadline.

This collegial process needs to continue to be restored as the Commission returns to its traditional independent and respected role. The NRC must operate within procedures that are agreed upon in a professional and collegial manner. Doing so will ensure that Americans know that we will be protected from harm while having our energy needs met well into the future.

Again, thank you, Madam Chairman. I look forward to the testimony.

Senator BOXER. We are going to turn to our Commissioners, 5 minutes for the Chairman, 3 minutes for everyone else who would like to be heard. Welcome again.

**STATEMENT OF HON. ALLISON M. MACFARLANE, CHAIRMAN,
U.S. NUCLEAR REGULATORY COMMISSION**

Ms. MACFARLANE. Thank you very much, Senator Boxer.

Chairman Boxer, Ranking Member Inhofe, Chairman Carper, Ranking Member Barrasso, and members of the Committee, my colleagues and I are honored to appear before you today on behalf of the U.S. Nuclear Regulatory Commission.

Having appeared before you in June as a nominee, I want to thank you for confirming me and for your careful oversight of the NRC.

I look forward to today's hearing, my first before you as NRC Chairman. I am pleased to join with my fellow Commissioners to discuss the critical policy issues facing our agency.

Two months into my tenure, I have a much better sense of the agency and its dedicated staff. I have spent many hours in meetings and briefings on the issues currently before the agency, both at NRC headquarters and at our four regional offices, three of which I have now visited. The fourth is tomorrow.

I have also informally walked the floors of our headquarters building, eaten lunch with our personnel in the cafeteria, and met them in the gym. I have been consistently impressed by the seriousness with which the NRC staff approach their mission of protecting the safety of the American people and the enthusiasm they have for their work, and I have been touched by the warmth with which I have been welcomed by them.

I also appreciate the sincere welcome that I have received from my colleagues on the Commission, and I deeply value our working relationship. I am meeting with each Commissioner regularly, seeking their views on major issues facing the agency and benefiting from their expertise. I look forward to a sustained collegial relationship with them.

I am committed to maintaining open lines of communication and a respect for their perspectives, insights, and best judgment. I believe that by working together collegially, the product of our efforts as a Commission will be stronger and much more protective of the public interest.

I also look forward to working with this Committee and with the Congress. I inherited a backlog of congressional correspondence when I arrived at the NRC, and I am pleased to report that this backlog is now clear.

Since arriving at the NRC, I have found an organizational culture that promotes an open, collaborative work environment, encourages all employers and contractors to share concerns and differing views without fear of negative consequences, and encourages any employee to initiate a meeting with an NRC manager or supervisor, including a Commissioner or the Chairman, to discuss any matter of concern.

I am determined that these organizational commitments will continue under my leadership. I believe these values are worthy of highlighting as we reinforce our agency's focus on its critical mission of safeguarding the public's health, safety, and security and protecting the environment. These values are especially pertinent at a time when the agency is dealing with a wide array of critical safety matters. It is in this context that we update you on the NRC's implementation of the safety enhancements following the Fukushima Daiichi accident.

With everything that we have assessed to date, the Commission continues to believe that there is no imminent risk from the continued operation of the existing U.S. nuclear power plants. At the same time, the NRC's assessment of Fukushima leads us to conclude that additional requirements should be imposed on licensees to increase the capability of nuclear power plants to mitigate beyond design basis natural phenomena.

The Commission has approved the prioritization of the recommendations of a post-Fukushima NRC senior level task force into three tiers. Tier One consists of actions to be taken without delay; these actions are already underway. Tier Two is the next set of actions that can be initiated as soon as critical skill sets become available and pertinent information is gathered and analyzed. Tier Three recommendations require that the staff conduct further study or undertaken short-term actions first.

Under Tier One actions, the staff has already issued three orders and requests for information from our licensees. Safety upgrades are well underway at many of our licensees. NRC work on Tier Two and Tier Three recommendations is beginning.

The NRC staff has presented the Commission with its plans for addressing each of the Tier Three recommendations. Of course, as we evaluate those recommendations, we will engage in extensive dialogue with all the relevant stakeholders. The NRC staff has

done an outstanding job of not only making progress addressing lessons learned from Japan but also continuing to ensure the safe and secure operation of all our existing license facilities. The Commission is dedicated to never losing sight of the fact that our effectiveness as a safety and security regulator depends first and foremost on the staff's hard work and dedication.

Thank you for this opportunity to appear before you today. I would be happy to answer any questions.

[The prepared statement of Ms. Macfarlane follows:]

WRITTEN STATEMENT
BY ALLISON M. MACFARLANE, CHAIRMAN
UNITED STATES NUCLEAR REGULATORY COMMISSION
TO THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
AND THE
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY
UNITED STATES SENATE
SEPTEMBER 12, 2012

Chairman Boxer, Ranking Member Inhofe, Chairman Carper, Ranking Member Barrasso, and Members of the Committee, my colleagues and I are honored to appear before you today on behalf of the United States Nuclear Regulatory Commission (NRC). Having appeared before you in June as a nominee, I want to thank you for your support during that process. I look forward to today's hearing – my first before you as NRC Chairman.

Two months into my tenure, I have met many dedicated professionals through meetings and briefings on the issues currently before the Agency. I have informally walked the floors of our headquarters building; eaten with our personnel in the cafeteria, and I visited our four regional offices. I am quite impressed with the NRC staff and their commitment to the Agency's important mission of protecting the public's safety and security.

I also appreciate the warm welcome that I have received from my colleagues on the Commission. I am meeting with each Commissioner regularly. We share perspectives on major issues facing the agency, and benefit from each other's expertise. I look forward to a continued collegial relationship with them.

I am committed to serving on the NRC with the attributes that I consider important to good governance – openness, efficiency and transparency. I will make a strong commitment to

collegiality at all levels. An agency endowed with the public trust such as the NRC requires a respectful working environment to assure its integrity.

Today I would like to update you on the NRC's implementation of safety enhancements based on our review of the Fukushima Dai-ichi nuclear accident.

With everything that we have assessed to date, the Commission continues to believe that there is no imminent risk from continued operation of existing U.S. nuclear power plants. At the same time, the NRC's assessment of insights from the events at Fukushima Dai-ichi led us to conclude that additional requirements should be imposed on licensees to increase the capability of nuclear power plants to mitigate the effects of beyond-design-basis extreme natural phenomena.

The Commission has approved the staff's prioritization of the recommendations of the Near-Term Task Force ("Task Force") into three categories, or tiers. Tier 1 consists of actions to be taken without delay, and these actions are underway. Tier 2 is the next set of actions that can be initiated as soon as staff resources become available and pertinent information is gathered and analyzed. Tier 3 recommendations require that the staff conduct further study or undertake shorter-term actions first.

On March 9, the Commission authorized the NRC staff to issue three immediately effective Orders to U.S. commercial nuclear reactors as part of its Tier 1 actions. These Orders address some of the recommendations from the agency's Task Force Report issued in July 2011, that the NRC determined should and could be implemented without delay. The Orders, issued by the staff on March 12, require several things:

- 1) Licensees must develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities following a beyond-design-basis extreme natural event.
- 2) Licensees with BWR Mark I and Mark II containments must have a reliable hardened vent to remove decay heat and maintain control of containment

pressure within acceptable limits following events that result in the loss of active containment heat removal capability or prolonged station blackout.

- 3) All operating reactors must have a reliable indication of the water level in spent fuel storage pools.

For all three of these Orders, licensees are required to submit their plans for implementing these requirements to the NRC by February 28, 2013, and complete full implementation no later than two refueling cycles after submittal of a licensee's plan or December 31, 2016, whichever comes first. Additionally, licensees are required to provide periodic status reports so that the staff can monitor their progress in implementing the orders and take prompt and appropriate regulatory action, if necessary.

On May 31, 2012, the NRC staff issued draft guidance related to implementation of all three Orders for a 30-day public comment period. After considering comments received, the NRC staff issued final implementation guidance for all three Orders on August 29, 2012. These final guidance documents provide details on acceptable approaches for complying with the requirements of the Orders.

In addition to the three Orders issued on March 12, licensees were also issued a "request for information" that includes the following:

- 1) Licensees were asked to perform, and provide the results of, a reevaluation of the seismic and flooding hazards at their sites using current NRC requirements and guidance, and identify actions that are planned to address any vulnerabilities. The results will determine whether additional regulatory actions are necessary.
- 2) Licensees were requested to develop a methodology and acceptance criteria and perform seismic and flooding walkdowns. We expect that performance deficiencies identified during the walkdowns will be addressed by each site's corrective action program. Licensees were asked to confirm that they will be

using the walkdown procedures jointly developed by the NRC and industry or provide alternative, plant-specific procedures.

- 3) Licensees were requested to assess the ability of their current emergency communications to perform under conditions of onsite and offsite damage and prolonged loss of alternating current electrical power. Licensees also were requested to assess the plant staffing levels needed to respond to a large-scale natural event and to implement strategies contained in the emergency plan.

The remaining near-term recommendations comprise two rulemakings addressing station blackout and integration of emergency procedures. The Commission directed the use of an Advance Notice of Proposed Rulemaking for the station blackout rulemaking to allow for early stakeholder involvement and formal comments. The Commission also designated the station blackout rulemaking as a high-priority activity with a goal of completion within 24-30 months from October 2011. The emergency procedures integration rulemaking also used an Advance Notice of Proposed Rulemaking to solicit early stakeholder input. These notices were issued in March and April respectively.

Going forward, we will continue stakeholder interaction to support any necessary guidance development activity for the requests for information. Beyond that, we will continue our ongoing efforts on the highest priority, near-term rulemakings.

Regarding Tier 2 recommendations, we anticipate beginning that work once we collect information that is required from Tier 1 activities in order to address Tier 2 recommendations, and when we are able to reallocate critical staff resources previously devoted to Tier 1 activities. For example, the review of other external hazards, such as high winds from tornados and hurricanes, will begin when resources currently being applied to the flood hazards assessments become available.

On July 13, 2012, the NRC staff presented the Commission with its plans for addressing each of the Tier 3 recommendations. On August 24, 2012, the Commission directed the NRC staff to compare practices for hydrogen control for plants in other countries with those of U.S. plants. The staff was also directed to compare practices for spent fuel transfer from pools to dry cask storage in other countries with practices in the U.S. The results from these comparisons will be provided to the Commission when the staff provides their recommendations for resolving the Tier 3 activities.

We are making good progress on these issues. My colleagues on the Commission and I look forward to continuing to work with the NRC staff as agency works diligently to address the remaining lessons-learned from Japan.

The NRC staff has done an outstanding job of not only making good progress on lessons-learned from Japan, but also on continuing to ensure the safe and secure operation of all our existing licensed facilities. The Commission never loses sight of the fact that our effectiveness as a safety and security regulator depends first and foremost on the staff's hard work and dedication.

While many licensees performed well during the past year, there are currently four nuclear reactors and one fuel facility that are in an extended shutdown mode. One of those nuclear reactors, the Fort Calhoun Station, is currently in a shutdown condition due to significant performance concerns. Fort Calhoun shut down for a scheduled refueling outage in April 2011 and remained offline because of extensive flooding from the Missouri River. The licensee is addressing flood damage, technical issues, and performance problems. The NRC increased its regulatory oversight of the plant in December 2011 and established a special oversight panel to coordinate NRC regulatory activities. NRC approval is required before the licensee will be allowed to restart the reactor.

Another reactor, Crystal River Three, has been shut down since September 2009 while the licensee continues to address issues with the concrete in its containment structure. NRC approval is required before the licensee will be allowed to restart the reactor.

In addition, the two units at the San Onofre Nuclear Generating Station have been shut down since the beginning of the year due to problems with tube wear in their new steam generators. On March 27th, the NRC issued a Confirmatory Action Letter documenting actions that Southern California Edison officials have agreed to take related to unusual wear on steam generator tubes prior to restarting both units.

Honeywell International, Inc., the licensee for a uranium hexafluoride conversion facility in southern Illinois, shut down the fuel facility for a scheduled maintenance outage in May 2012, and the facility has remained shutdown to address issues associated with the facility's emergency response plan. The NRC staff approved Honeywell's request to restart limited operations to transfer the existing inventory of uranium hexafluoride into certified cylinders for more secure storage of the material. In the longer term, Honeywell anticipates making plant modifications. Consideration is also being given to making changes to its emergency response plan, and updating procedures to address the issues associated with its emergency response plan. NRC will verify that Honeywell has provided reasonable assurance of public health and safety before allowing it to resume production.

I also want to update you regarding Waste Confidence. Recently, the U.S. Court of Appeals for the District of Columbia Circuit found that the NRC had violated the National Environmental Policy Act in issuing its 2010 update to the Waste Confidence Decision and accompanying Temporary Storage Rule. The court vacated both the Decision and the Rule, and remanded the case for further proceedings consistent with the court's opinion. On August 7, 2012, the Commission issued an Order, in response to petitions we received following the court's decision, stating that we will not issue licenses dependent upon the Waste Confidence Decision or the Temporary Storage Rule until the court's remand is appropriately addressed.

This determination extends just to *final* license issuance; all licensing reviews by NRC staff and proceedings will continue to move forward.

On September 6, 2012, the Commission directed the NRC staff to develop, within the next 24 months, an environmental impact statement, a revised waste confidence decision, and a rule on the temporary storage of spent nuclear fuel. As we assured petitioners in the Order, and in our direction to the NRC staff, the public will be afforded opportunities to comment on these actions.

Transparency and openness are part of our formal NRC organizational values and they are integral guiding principles in everything we do, both internally and externally. After the challenges we have faced over the past year, and the bright spotlight that has been shined on nuclear regulation, nuclear safety, and nuclear power plants by the Congress, the media, and the public, the NRC continues to be accessible and open to make sure that all of our stakeholders understand what we are doing and why we are doing it. One of my goals as Chairman is to promote better communication with the public. An independent regulator like the NRC cannot ensure public trust and instill public confidence unless we communicate well. I emphasize this every time I talk with the staff. We need to ensure that we communicate effectively with the public, so that the public can have confidence in our work.

By no means does my testimony cover the full breadth of the agency's wide-ranging activities. We have many important issues on our plate right now -- both internally and externally -- ensuring the safety and security of our nation's nuclear facilities and materials. We are committed to prudently managing the resources entrusted to us by the American people, taking full advantage of all the talents and expertise that our diverse team brings to the table, and keeping our focus - first and foremost - on public health, safety, and security.

As we look forward, the agency expects to meet new challenges. We are confident that the NRC will continue to ensure the safe and secure operation of the existing licensed facilities,

and the safe and secure uses of radioactive materials, while also ensuring the safe and secure construction and operation of new nuclear power plants, possibly including small modular reactors and other nuclear facilities.

Chairman Boxer, Ranking Member Inhofe, Chairman Carper, Ranking Member Barrasso, and Members of the Committee, this concludes my formal testimony today. Thank you for the opportunity to appear before you. My colleagues and I would be pleased to respond to any questions you may have.

Questions from Senator Barbara Boxer

QUESTION 1 **What actions has the NRC taken to respond to, and address, the concerns raised by elected officials in California who have written to the NRC about the safety of the San Onofre nuclear power plant? Please provide me with all NRC letters to such elected officials, a description of the actions that the NRC has taken to address each concern expressed by the elected officials, and a description of the NRC's plan and timeline to fully respond to any unaddressed concerns.**

ANSWER:

The NRC has responded to concerns expressed by elected officials. Copies of the NRC response letters to the elected officials are attached for your reference. We are continuing to receive letters from elected officials and will provide you with copies of our responses. We remain committed to providing California's elected officials and the public with full and complete information regarding our process for reviewing the status of the San Onofre plant.

Some requests made by California officials, particularly requests for a license amendment process and requests for an opportunity for a hearing, were also contained in a petition to the Commission and therefore fall under the Commission's adjudicatory responsibilities. In response to the relevant petition, the Commission approved CLI-12-12 on November 8, 2012. That Order (1) refers the issue of whether there was a violation of the 10 C.F.R. §50.59 process used for replacement of the steam generators to the Executive Director for Operations for consideration under 10 C.F.R. § 2.206; (2) refers the request for a hearing on the Confirmatory Action Letter to the Atomic Safety and Licensing Board Panel (ASLBP) for consideration

pursuant to Commission direction; and (3) denies, without prejudice, the stay request and the request for a discretionary hearing.

The ASLBP and the staff, as appropriate, will be working to address those matters and the petitioners and public will be advised of the outcome.

QUESTION 2 Will the NRC respond to calls for increased transparency and scrutiny of the problems that led to San Onofre nuclear power plant's damaged steam generators by using the most thorough process available to the Commission, including a license amendment process, which allows both the NRC and citizens to ask questions, analyze issues, and resolve uncertainties to help ensure such problems are understood and addressed at the San Onofre plant?

ANSWER:

The NRC is committed to ensuring that the public is informed about the condition of the San Onofre Nuclear Generating Station (SONGS) and our staff's work to assess its safety. A number of public meetings have been held, most recently on October 9th in Dana Point, CA, to discuss the status of the issues at SONGS and to hear views of interested local stakeholders. The NRC will continue to hold public meetings concerning SONGS as part of its independent, in-depth oversight (e.g. inspections and detailed reviews) of the issues at SONGS. In addition, inspection reports, the confirmatory action letter, and other written communications related to the steam generators are also publicly available.

The NRC will not allow the plant to restart until we are satisfied that the licensee can operate the plant without undue risk to public health and safety. The NRC will take the time needed to determine the appropriate actions to ensure the safety of the public, and will continue to keep the public informed of its review process.

On June 18, 2012, the Commission received a petition to intervene and a request for a hearing related to SONGS. The petition requested a hearing on the issue of whether a license amendment was required for the replacement of the SONGS' steam generators. On November 8, 2012, the Commission issued an order referring one portion of the petition to the Atomic Safety and Licensing Board Panel for consideration, and referring another portion of the petition to the NRC Executive Director for Operations for consideration under 10 CFR 2.206. This section of the Code of Federal Regulations provides stakeholders with a forum to advance their concerns and to obtain full or partial relief, or written reasons why the request is not being granted. Actions taken throughout this process are publicly available. Any decision on either of the above-mentioned referrals is reviewable by the Commission. Therefore, it would be inappropriate for the Commission to comment on the outcome of the petition process at this time.

QUESTION 3 Will the NRC ensure that the Commission's process of overseeing nuclear power plant modifications that involve major structural work or changes to radiation containment systems undergo increased and systematic scrutiny, as through a license amendment process, in the future to help prevent a recurrence of the type of problems that have plagued the San Onofre nuclear power plant?

ANSWER:

The NRC provides independent oversight for modifications made to nuclear power plants through a combination of regulatory provisions, license amendment reviews, orders, inspections, and enforcement as appropriate. The utilization of any of these regulatory tools is dependent upon the authority, need, scope, and purpose for the particular proposed activity. With respect to the use of the license amendment process for the steam generator issue at San Onofre Nuclear Generating Station, the Commission, by Order, referred this matter to the agency's 2.206 petition process. This process, named for the section of the Code of Federal Regulations in which it is outlined, provides stakeholders with a forum to advance their concerns and to obtain full or partial relief, or written reasons why the request is not being granted. Actions taken throughout this process are publicly available. Because the Commission may review the outcome of that proceeding, it would be inappropriate for the Commission to comment on the outcome of the petition process at this time.

QUESTION 4 **What is the status of the NRC's implementation of the Task Force recommendation that the Commission "initiate [a] rulemaking to require licensees to confirm seismic hazards and flooding hazards every 10 years?" Will the NRC ensure that when reassessing such hazards, the plants address important new information that can help to resolve questions about the nature of such threats and potentially change the estimated hazard that such threats pose to the plants and the public?**

ANSWER:

Under Tier 1 of the Task Force recommendations, the NRC has required that each operating reactor licensee re-evaluate the seismic and flooding hazards to its licensed facilities. These efforts are consistent with the NRC's standard practice of acting on significant new information when it becomes available. These re-evaluations and any resulting actions will be implemented over the next several years. In the meantime, the NRC staff intends to initiate some activities in Fiscal Year 2013 in preparation for a possible rulemaking or other action to address the recommendation related to a periodic assessment of hazards. The information provided by licensees regarding the on-going evaluations will help determine whether additional regulatory actions are necessary. Re-evaluations of seismic and flooding hazards at operating reactor sites, requested by NRC staff via formal letters in March 2012, will facilitate NRC's determination of whether the design bases for structures, systems, and components important to safety should be updated. The information being provided by the licensees will also inform the NRC staff's assessment of the recommendation cited in your question in terms of developing any proposed requirements for licensees to periodically consider new information and address revised estimates of risks associated with external hazards.

QUESTION 5 **Given your expertise in geology please describe the importance of the Task Force's recommendation to protect nuclear power plants against earthquakes using the latest information on such risks for ensuring the safety of nearby communities.**

ANSWER:

The Commission is specifically interested in advances in the understanding of seismic hazards, and the application of that knowledge to safety at NRC licensed reactors. For example, the NRC together with the Electric Power Research Institute (EPRI) and the Department of Energy (DOE) recently developed new seismic source models for the central and eastern United States. This effort predated the accident at Fukushima and is an example of the NRC's standard practice of acting on significant new information when it becomes available. This information has been folded into our Fukushima lessons learned efforts to ensure that our improved understanding of seismic risks is used by licensees during the seismic reevaluations required by the NRC for all United States nuclear power plants. Similarly, licensees in the western United States are developing seismic hazard estimates and will provide the results of their assessments the NRC as part of the submittals required by the post-Fukushima Requests for Information.

QUESTION 6 A July 13, 2012 letter from the NRC Executive Director of Operations to the Commissioners states, "There are no resources included in the FY 2012 budget and the FY 2013 Congressional Budget Justification for tier 3 activities," which include important safety enhancements related to seismic risks. Please explain how the NRC will plan and implement all the recommendations before the 2016 goal for such activities and describe the funding needed to support these efforts?

ANSWER:

The continuing need to dedicate NRC resources to the development and disposition of the post-Fukushima activities, including the longer-term Tier 3 items, has been addressed as part of the NRC's ongoing planning and budgeting process. Resources have been identified and provided to the NRC staff offices for the current fiscal year to continue their three-tier efforts to develop and apply lessons learned from the accident, consistent with the framework previously established by the Commission. The NRC has taken action to evaluate all of the identified lessons learned, including the establishment of milestones and schedules to assure completion of these activities in accordance with the project plans defined in staff papers submitted to the Commission. In addition, the NRC planning and budgeting processes include routine monitoring and adjustments of resources as necessary to ensure that the agency is focused on the appropriate safety concerns, whether related to Fukushima or other events, conditions, or issues. The NRC is committed to ensuring that the appropriate resources are dedicated within our operating budget to meet the target schedules and will incorporate such requirements in its future budget requests.

QUESTION 7 **Does the NRC currently have the authority to recover 90 percent of the amount necessary to implement the Task Force recommendations through fees assessed to NRC licensees such as nuclear power plants?**

ANSWER:

The NRC has the authority to recover approximately 90 percent of its budget authority through the assessment of fees to licensees for regulatory services rendered based on the Omnibus Budget Reconciliation Act of 1990, as amended. The NRC activities in response to the Near-Term Task Force recommendations are considered fee-recoverable activities.

QUESTION 8 **What actions has NRC taken regarding the recommendations of the President's Blue Ribbon Commission on America's Nuclear Future?**

ANSWER:

The NRC staff has reviewed the Blue Ribbon Commission's (BRC) recommendations. The U.S. Department of Energy (DOE) is the lead agency for developing a response to the BRC report and for implementing any changes to the national policy on nuclear waste management. Further, many of the BRC recommendations require legislative action before they can be implemented. The NRC staff is closely monitoring the development of any changes in national policy or legislative changes that may result from the BRC recommendations. The NRC staff is also monitoring international repository development programs to increase its understanding of potential repository issues in a variety of geologic settings. The NRC will adjust our regulatory programs, as necessary, consistent with national policy initiatives.

QUESTION 9 **Which U.S. nuclear power plants are currently out of compliance with the NRC's fire safety regulations?**

ANSWER:

Currently, no plants have significant unresolved inspection findings associated with fire protection regulations. Fire protection findings of very low safety significance are resolved under licensee corrective action programs. Licensees receive regular inspections to assess licensee corrective action programs and compliance with fire protection regulations under the baseline reactor oversight process.

QUESTION 10

The NRC is allowing nuclear power plants to transition to alternative risk-based fire protection standard through a license amendment process.

a. Please list and describe the status of activities related to the following plants:

i. the plants that the NRC is currently reviewing for compliance with the established fire protection requirements in 10 CFR 50.48(b)

ii. the plants that have committed to use an alternative approach (National Fire Protection Association Standard 805 (NFPA 805) to comply with fire protection requirements from the 805 standard;

iii. the plants using Operator Manual Actions (OMA), including the types of OMAs;

iv. the plants using OMAs that the NRC has approved for use at such plants;

v. the plants using OMAs that the NRC has not approved for such use; and

vi. the plants at which the NRC has approved a license amendment for the use of the alternative NFPA 805 approach.

b. Please provide the NRC's schedule for completion:

i. any investigation for the unauthorized use of OMAs; and

ii. the reviews and license amendment process for each plant that has committed to using the alternative NFPA 805 approach

ANSWER:

10.a.i Currently, plants that are subject to the fire protection requirements of 10 CFR 50.48(b) are reviewed for compliance as part of the Reactor Oversight Process. This regulation only applies to plants that were licensed prior to January 1, 1979, and also does not include the three Oconee units that have already adopted National Fire Protection Association Standard 805 (NFPA 805), the voluntary performance-based, risk-informed fire protection rule. The following table includes a list of the plants that are required, per regulation, to meet 10 CFR 50.48(b):

Plant	Plant
Arkansas Nuclear One 1 and 2	Millstone 2
Beaver Valley 1	Monticello
Browns Ferry 1, 2 and 3	Nine Mile Point 1
Brunswick 1, 2	North Anna 1
Calvert Cliffs 1, 2	Oyster Creek
Cook 1, 2	Palisades
Cooper	Peach Bottom 2, 3
Crystal River 3	Pilgrim 1
Davis-Besse	Point Beach 1, 2
Dresden 2, 3	Prairie Island 1, 2
Duane Arnold	Quad Cities 1, 2
Farley 1	Robinson 2
FitzPatrick	Salem 1
Fort Calhoun	St. Lucie 1
Ginna	Surry 1, 2
Hatch 1, 2	Three Mile Island 1
Indian Point 2, 3	Turkey Point 3, 4
Kewanee	Vermont Yankee

10. a.ii. The following table lists the plants that have committed to use NFPA 805 to comply with fire protection requirements:

Plant	Plant
Arkansas Nuclear One Unit 1	Fort Calhoun
Arkansas Nuclear One Unit 2	Joseph M. Farley 1&2
Beaver Valley 1&2	Oconee 1, 2 &3
Browns Ferry 1,2,3	Nine Mile Point 1
Brunswick 1&2	Palisades
Callaway	Point Beach 1&2
Calvert Cliffs 1&2	Prairie Island 1&2
Catawba 1&2	R.E. Ginna
Cooper	Robinson 2
Crystal River 3	San Onofre 2&3
D.C. Cook 1&2	Shearon Harris
Davis Besse	St. Lucie 1&2
Diablo Canyon 1&2	Turkey Point 3&4
Duane Arnold	V.C. Summer
	Waterford 3

10.a.iii, 10.a.iv, 10.a.v, and 10.b.i. Operator manual actions are used at all U.S. nuclear power plants. The manual actions include operating switches, opening valves, and other types of operator actions.

The NRC staff reviews operator manual actions as part of the Reactor Oversight Process. Where operator manual actions are identified as unauthorized and in violation of the NRC regulations, the noncompliances are addressed as part of the Reactor Oversight Process. The NRC notes that manual actions that are not approved by the NRC are not, per se, "unauthorized", inasmuch as there may be situations in which NRC regulations and other requirements may allow licensees to use manual actions without NRC review and approval, if certain criteria are met. Such actions are referred to as "compensatory actions." Thus, part of

the NRC's inspection effort is determining whether a licensee's use of manual actions was done in accordance with NRC's regulations and other requirements.

Approval of operator manual actions is included in a plant's licensing basis or in approved exemptions. Plants that are using operator manual actions without NRC review and approval are subject to actions under the Reactor Oversight Process to determine whether appropriate criteria have been met. Currently, two licensees that are not adopting NFPA 805 are relying on unapproved operator manual actions until modifications can be completed such that the plant achieves compliance without reliance on operator manual actions. The two reactors involved are Indian Point 2 and 3. The NRC identified that these licensees used unapproved manual actions in violation of NRC requirements, in an inspection report dated August 16, 2012, which is publicly available. The violations do not pose immediate safety concerns and the licensee has developed a corrective action plan in a publicly available document.

10.a.vi. To date, the NRC has issued a license amendment for the use of NFPA 805 at the Shearon Harris and Oconee plants in June and December 2010, respectively.

10.b.i. is answered above.

10.b.ii. The staff is actively reviewing twelve license amendment requests that have been submitted to date. The schedule, per the staff's paper to the Commission, for reviewing the initial set of NFPA 805 license amendment requests (LARs) is two years. After completing the review of an initial set of LARs, the staff will aim for a review duration of approximately one year, while still conducting the reviews to the level of

completeness and thoroughness required for the determination of adequate protection,
per Commission direction.

QUESTION 11 **The Japanese parliament’s investigative commission on Fukushima identified a reluctance to question authority as one of the fundamental causes of the accident. I believe that the NRC and domestic nuclear power plants must have the highest commitment to safety in the world. What actions could help to strengthen the safety culture within the NRC and at U.S. nuclear power plants?**

ANSWER:

The NRC has a longstanding history of promoting a positive safety culture to ensure the agency achieves its mission. The agency has recently undertaken initiatives to focus on continuous improvement of our internal safety culture. Communication is a key element in all efforts to strengthen the NRC’s safety culture. We have in place an educational program to communicate to the staff the Commission’s vision regarding safety culture. Expectations for an open and collaborative work environment (i.e., an environment that encourages differing views) are routinely communicated by managers and supervisors in a variety of formats (e.g., staff meetings, web pages, newsletters, and postings throughout agency buildings) and are included in orientation and training courses offered to all employees. In addition, to further strengthen our safety culture, the NRC maintains the Differing Views Programs (i.e., the Open Door Policy, the Differing Professional Opinions Process, and the Non-Concurrence Process), and agency-level procedures explicitly prohibit retaliation against employees who engage in the Differing Professional Opinions Process or the Non-Concurrence Process.

NRC employees have participated in the Federal Employees Viewpoint Survey, which was administered in the April/May 2012 timeframe and was designed to measure employees’ perceptions of whether, and to what extent, conditions characterizing successful organizations

are present in Federal agencies. The survey results were very positive, ranking the NRC first among the 37 largest federal agencies in the categories of talent management and leadership and knowledge management; second in job satisfaction; and third in results-oriented performance culture.

However, the NRC leadership is always looking for ways to improve in this important dimension. In this context, the Comprehensive Plan for Agencywide Review of Safety Culture was transmitted to the Commission by the staff in July 2012. The Plan is designed at a high level to assess and continually improve the NRC's internal safety culture with a focus on the environment for raising concerns; it contains two key components that are being overseen by NRC's Agency Culture Advisory Group. The first main component relies on the results from a recently completed Safety Culture and Climate Survey conducted by the NRC Office of the Inspector General and administered in the August/September 2012 timeframe. The second main component of the plan continues ongoing implementation activities to strengthen the agency's safety culture and the trust environment required to promote openly raising concerns. The plan identifies additional activities to be undertaken to improve the agency's organizational and safety culture.

With regard to strengthening safety culture at U.S. nuclear power plants, the NRC incorporated safety culture into the Reactor Oversight Process in 2006, and results to date show that the program is effective. The NRC's 2011 Safety Culture Policy Statement, developed over a three-year period with extensive outreach to stakeholders, expresses the Commission's expectation that all organizations performing regulated activities consider the importance of developing and maintaining a positive safety culture. The Policy Statement defines safety culture as "the core values and behaviors resulting from a collective commitment by leaders and individuals to

emphasize safety over competing goals to ensure protection of people and the environment.” This policy includes an expectation that U.S. nuclear power plant licensees will continue their efforts to develop and maintain a safety conscious work environment in which employees are encouraged to speak up when they have safety concerns. The Commission has directed the staff to continue to engage with stakeholders to communicate the contents of the Policy Statement, to educate stakeholders, and to ensure they have the necessary support to effectively employ the Policy Statement as they deem appropriate. This has included the NRC’s development of educational “tools” such as brochures and a set of actual case studies representing a breadth of industries, including energy, medical, and transportation.

QUESTION 12. **How will the NRC consider demographic changes, including population change around nuclear power plants, in its decisions to extend licenses and ensure safety?**

ANSWER.

The NRC performs a license renewal environmental review to consider the environmental effects of operating a nuclear power plant for an additional 20 years. The Commission determined that the NRC would prepare a supplemental environmental impact statement (EIS) for each license renewal action to fulfill its responsibilities under the National Environmental Policy Act (NEPA). This review includes the effects of continued reactor operations on the population living within 50 miles of the nuclear power plant. The NEPA analysis must use the latest census data to account for recent population and demographic changes.

The license renewal environmental review focuses on environmental impacts of extended operations. The safety review for license renewal focuses on the management of aging plant systems, structures, and components within the scope of Part 54 of the Commission's regulations. The management of the aging of those systems, structures, and components is analyzed in a safety evaluation report (SER), which is published before the renewed license is issued.

Safety issues associated with ongoing reactor operations are not tied to the license renewal decision, but are issues that need to be dealt with continuously as part of a nuclear power plant's current (and renewed) operating license. Any time issues related to public health or

safety are discovered at a nuclear plant, they are addressed immediately and any safety-related changes are incorporated under the current operating license.

Emergency planning issues are related to ongoing reactor operations. Although the Commission has determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal, each plant owner is required to participate in an exercise testing its emergency response plan with the NRC, FEMA, and offsite authorities at least once every two years to ensure that State and local officials remain proficient in implementing their emergency plans and that the population surrounding the plant is protected. As such, the Commission, through required exercises, reviews existing emergency preparedness plans throughout the life of all nuclear power plants, keeping up with the changing demographics and other site related factors.

Question from Senator Thomas Carper

QUESTION 1

This past summer has been described as one of the hottest on record. There are reports that nuclear power plants were forced to shutdown because the water that is required to operate was too warm to help cool the plants. Some experts say that climate change may increase the risks to our nation's nuclear power plants, and, as a result, will impact our ability to generate electricity. For example, there is a concern that some nuclear power plants over time may become vulnerable to flooding due to rising sea levels.

a. How is the NRC addressing the risks that climate change may potentially impose on our nation's nuclear power plants?

b. What kind of preparation have existing and new reactors under construction undertaken to reduce their risks?

ANSWER:

a. NRC is concerned about a plant's ability to ensure that it has adequate cooling water to operate, as well as the potential threat posed by flooding and/or sea level rise. In general, NRC operational requirements regarding cooling water (e.g. sea water, lake, or river) levels and temperature are addressed in individual plant technical specifications that are part of the plant's NRC operating license.

Occasionally, some nuclear power plants have had to reduce power or shutdown due to cooling water intake or discharge exceeding technical specifications. For example, in August 2012, Millstone Power Station in Connecticut had to shut down as temperatures in its ultimate heat

sink, which receives plant cooling water discharge, exceeded those prescribed by its technical specifications.

From a broader perspective, implications of global climate change for flooding and sea level rise are important to coastal communities and generally to water-dependent critical infrastructure such as nuclear power plants. Changes in sea level at any individual coastal location depend not only on the increase in the global average sea level, but also on various regional geomorphic, meteorological, and hydrological factors. NRC is actively engaged regarding changes in environmental conditions at its licensed facilities. In informing NRC's operating reactor license renewal environmental reviews, NRC staff considers information sources such as the U.S. Global Change Research Program, which integrates and presents the prevailing consensus of federal research on climate and global change, as sponsored by thirteen federal agencies.

b. All currently operating nuclear power plants and new reactors under construction are located with consideration of site-specific environmental conditions, including meteorological and hydrologic siting criteria. NRC regulations also require that plant structures, systems, and components important to safety be designed to withstand the effects of natural phenomena, such as flooding from severe storms, without loss of capability to perform safety functions. If new information or operating experience relating to flooding becomes available, the NRC evaluates the new information to determine if any changes are needed at existing plants. Plant-specific flood protection issues are considered during site-specific safety reviews and, more specifically, are addressed on an ongoing basis through the Reactor Oversight Process and other NRC safety programs. In March 2012, as part of the agency's post-Fukushima actions,

the NRC required all licensees to re-analyze earthquake and flooding risks using the latest available information, and to conduct earthquake and flooding hazard "walkdowns" to closely examine each nuclear power plant's ability to meet current licensing requirements. The NRC staff will evaluate each licensee's response and determine if additional specific or collective actions are warranted.

Questions from Senator James Inhofe

- QUESTION 1** **What is the Commission doing to ensure that the NRC Staff is implementing its Fukushima recommendations in accordance with Commission direction?**
- a. Are you aware of instances where you believe the Staff has either misunderstood Commission direction in its implementation of the Commission's post-Fukushima orders? If so, what processes are in place to redirect the Staff's efforts?**

ANSWER:

The Commission has established a Japan Lessons Learned Steering Committee consisting of senior executives from across the NRC. The Steering Committee's charter is to oversee the agency's assessments and actions related to lessons learned from the Fukushima event. The Steering Committee meets frequently with the NRC staff to obtain updates on the status of activities and to direct the staff on the development and implementation of the various project plans for the short- and long-term activities, consistent with Commission direction. The Steering Committee is supported by the Japan Lessons Learned Project Directorate that was created to help coordinate the NRC's evaluation and resolution of recommendations of the Near Term Task Force and other issues related to the Fukushima accident. The NRC staff conducts frequent public meetings with stakeholders, including the nuclear industry, to ensure that agency expectations and related industry actions are effectively communicated. The NRC Steering Committee meets regularly with an industry committee coordinated by the Nuclear Energy Institute to share information and identify possible challenges or problems related to the NRC requirements or requests for information.

The Commission receives routine reports, and conducts periodic meetings with the NRC staff and stakeholders to discuss the agency's response to the Fukushima accident. These various communication channels and interactions have, to date, prevented any significant problems related to misunderstandings between the Commission and NRC staff. However, should a problem arise, the Commission would correct the problem through our regular interactions with the NRC staff and managers, and, if necessary, by formally issuing revised instructions.

The NRC staff continues work on the Tier 1 and Tier 2 actions in a manner that is consistent with the milestones set forth by the Commission. The staff's continued high-level focus on these actions has ensured steady progress, with stakeholder engagement, consistent with the established schedules. The staff has succeeded in performing these actions while ensuring that efforts do not displace ongoing work of greater safety benefit, work that is necessary for continued safe operation – or other existing high priority work, consistent with the Commission's direction.

QUESTION 2 **Much has been learned about the Fukushima accident and the Japanese response since the original near Term Task Force Report and the Commission's post-Fukushima orders.**

a. Have you continued to review the decisions and recommendations in light of the changing landscape? Are any adjustments appropriate?

ANSWER:

The NRC's Japan Lessons Learned Steering Committee consists of senior executives and they meet frequently with the NRC staff to obtain updates on the status of activities and to direct the staff on the development and implementation of the various project plans for the short- and long-term post-Fukushima activities. The NRC staff has developed an "additional issues" process that involves senior agency staff assessing new issues for possible consideration by this Steering Committee. The NRC staff and Steering Committee review new information from the ongoing recovery work and analyses of the events in Japan to incorporate insights into the NRC's activities. In fact, the Tier 3 list of activities contains several issues that were not identified in the original Near Term Task Force Report, but that the NRC later determined warrant inclusion as a lessons-learned issue. The NRC staff and Steering Committee also routinely meet and assess ongoing NRC activities and plans for disposition of future items, given improved understanding of the accident and the changes already being implemented by the nuclear industry. Members of the Steering Committee also meet regularly with their industry counterparts to provide awareness of changes in understanding and proposed actions. The NRC staff provides the Commission with specific plans as well as periodic updates on the overall set of activities initiated in response to lessons learned from the Fukushima accident and the subsequent evaluations.

- QUESTION 3** **3. The Commission has a paper before it (SECY-12-0110) and was briefed on September 11 on the subject of the economic consequences of land contamination.**
- a. Do you think that the NRC needs to reassess its framework for consideration of the economic consequences of land contamination?**
- b. What is the Commission's statutory authority for basing regulation on matters other than protection of public health and safety?**

ANSWER:

a. A key conclusion reached by the NRC staff in SECY-12-0110 was that the NRC's current regulatory framework already accounts for the offsite economic consequences arising from land contamination caused by the unintended release of radionuclides from an NRC-licensed facility during or following a severe accident or other event at the facility. However, the staff also identified potential options for revising the regulatory framework should the Commission desire to enhance or expand consideration of economic consequences from land contamination. In this paper the staff states that the accident at Fukushima Dai-ichi nuclear power plant in Japan initiated a discussion of how the NRC's regulatory framework considers offsite property damage and other economic consequences. These options are still under consideration by the Commission.

b. The Atomic Energy Act of 1954, as amended (AEA), provides the NRC with authority to regulate its licensees or applicants for the purpose of avoiding or mitigating offsite property

damage (i.e., damages to offsite property resulting from a release of radionuclides from an NRC-licensed facility during or following a severe accident or other event at the facility). The following sections of the AEA provide NRC with the authority to "minimize danger" to property: 103b.(2) (42 U.S.C. § 2133(b)(2)), 161b. (42 U.S.C. § 2201(b)), and 161i(3) (42 U.S.C. § 2201(i)(3)).

- QUESTION 4** **Is the NRC's consideration of economic consequences of land contamination based primarily upon a public perception that it is good policy rather than considerations of public health and safety?**
- a. To the extent that economic considerations do not form a basis for regulation under the Atomic Energy Act, should Congress consider this issue and provide direction before the NRC acts on its own?**

ANSWER:

Under section 182a. of the AEA (42 U.S.C. § 2232(a)), the Commission must take those actions it deems necessary to achieve adequate protection of public health and safety regardless of economic costs. While economic considerations are not part of "adequate protection" or used to determine the safety benefit of a proposed regulatory action, economic factors may be considered when performing regulatory analyses (consistent with the guidance in OMB Circular A-4, "Regulatory Analysis"); environmental analyses pursuant to National Environmental Policy Act requirements; and when assessing the direct and indirect costs of a proposed backfit under Title 10 of the *Code of Federal Regulations* Parts 50, 70, 72, and 76. In addition to ensuring adequate protection of radiological health and safety under the AEA, the NRC has additional, discretionary authority to "minimize danger" to property under sections 103 and 161 of the AEA (see the response to question 3.b.). Under the authority provided by sections 103 and 161 of the AEA, the NRC can consider costs (as well as societal benefits) in taking regulatory actions to protect offsite property.

- a. Sections 103 and 161 of the AEA (see the response to question 3.b.) provide the NRC with authority to regulate its licensees for the purpose of avoiding or mitigating offsite property

damage (i.e., damages to offsite property resulting from a release of radionuclides from an NRC-licensed facility during or following a severe accident or other event at the facility). The NRC interprets the term "property" broadly to include both real property (e.g., land and buildings) and personal property (e.g., equipment, vehicles, livestock, crops). Thus, "offsite property damage" encompasses a broad range of offsite economic impacts associated with the unintended release of radionuclides, including loss of use and damage to property, relocation costs, and business disruption. Given the NRC's current legal authority to regulate its licensees for the purpose of avoiding or mitigating offsite property damage resulting from radiological events, the Commission does not recommend any legislative changes at this time.

QUESTION 5.a **The Commission and its staff identified the “Tier One” action items stemming from the recommendations of your post-Fukushima tsunami task force. You are implementing these in a timely way. It seems to me that since these Tier One action items will yield the most significant gains, it is incumbent on the NRC regulator and the operator implementers to focus on the successful and timely implementation of these items.**

a. As the industry has by far the largest task in implementing new requirements, what assessments have you done to ensure that the impact of imposing requirements of lesser safety impact will not detract from the ability on the completion of the most significant Tier One tasks?

ANSWER:

The NRC identified those activities that should be resolved without unnecessary delay (Tier 1) and issued Orders, advance notices of proposed rulemakings, and requests for information from licensees to initiate those activities. In developing implementation plans for the Tier 1 items and in initiating discussions on the Tier 2 and Tier 3 items, the standard practice has been for both the NRC staff and industry to form working groups to coordinate activities, avoid miscommunications, and identify issues, (including any conflicts between Fukushima-related tasks and other activities needed to ensure the continued safe operation of nuclear plants). In addition to the staff-level interactions, the NRC and industry routinely communicate through joint Steering Committee meetings and Commission-sponsored meetings with stakeholders. A key aspect of these meetings is to ensure that limited resources are being dedicated to the most appropriate safety improvements.

QUESTION 5.b b. How are you assessing the availability of vendor and engineering firms that possess the quality performance record and expertise to contract for hardware improvements and necessary analysis for tasks beyond Tier one?

ANSWER:

The Commission and the NRC staff are aware of the impact of NRC Orders, requests for information, and other activities on the availability of subject matter experts and the industry's capability to perform technical assessments and respond to regulatory changes. For example, the availability of technical experts was a major consideration in the NRC staff's development of a prioritization scheme for completion of seismic risk evaluations. The NRC understood, through collaborative efforts with the industry, that there are not enough seismic risk analysis experts to allow all U.S. reactors to be analyzed simultaneously. Therefore, the NRC has prioritized the assessments and related submittals such that those plants that may be most affected by revised seismic hazard information are first to be analyzed. The NRC continues to interact with stakeholders to understand potential challenges with expert resources and will evaluate and adapt to future issues if they arise. The nuclear industry has formed working groups for routine interactions with the NRC staff and a steering committee to interface with the NRC's Japan Lessons Learned Steering Committee. Industry executives and other stakeholders are also routinely invited to meetings with the Commission. The industry can and has raised resource issues with the NRC using all of these avenues of communication.

QUESTION 5.c c. What is more important – the successful resolution and disposition of all post-tsunami action items or the completing them within the 5-year time frame that seems to have been established without assessment of the staffs' or the industry's capacity to bring resources to bear on them with proper focus? If you believe that 5 years is proper as a timeframe, please provide specific analysis and data you used to reach that determination.

ANSWER:

The NRC established goals to complete those issues identified as Tier 1 within the 5-year time frame you mention in your question. The NRC thought such goals were appropriate based on the typical timelines to complete regulatory actions. In addition, it was important to establish such goals and to incorporate them into our activities to ensure no unnecessary delays in the initiation and implementation of the most important of the safety improvements identified following the Fukushima accident. However, the focus of the agency is to ensure that issues are successfully resolved. As mentioned in the questions and responses above, various communication channels are in place to discuss the Fukushima-related activities and associated schedules to make sure that both the NRC's and licensees' resources are being dedicated appropriately. The project plans for the Tier 3 items are described in the staff's July 2012 update to the Commission (SECY-12-0095). The NRC staff is initiating discussions with the nuclear industry and other stakeholders on these project plans and these discussions will include the proposed schedules, availability of resources, and other issues to ensure efforts to improve safety are carried out as effectively and efficiently as possible.

QUESTION 6.a The previous Chairman indicated publically that he equated industry concerns over cumulative effects of imposing new requirements as meaning “costs.” Yet the industry has demonstrated leadership on the part of the operators of the facilities, INPO, and NEI in responding to the lessons of the tsunami.

a. Does the NRC consider cumulative impacts in making decisions on resource allocation shifts that respond to new workloads?

ANSWER:

The NRC staff recently proposed action to implement rulemaking process enhancements to address the Cumulative Effects of Regulation (CER) following a policy paper to the Commission and the resulting Commission direction.

As established by the CER process enhancements proposed by the NRC staff, the *Federal Register* notices for CER-applicable proposed rules would contain questions on cumulative effects. Specifically, those questions would ask the public to respond whether the proposed requirements are impacted by resource constraints. In addition to those questions, the CER process enhancements stress public interaction during all phases of the rulemaking process. In order for CER to be successful, the nuclear power industry and members of the public, must be engaged throughout those interactions to provide NRC information on resource constraints that should be accounted for in the final rulemaking action. Once identified, the NRC can consider creating implementation schedules that account for the availability of resources.

QUESTION 6.b **b. Do you believe there is an appropriate role for the industry and the staff to discuss and identify the resource allocation and, importantly, the focus shifts that new tasks create? Isn't this particularly wise when initiatives beyond Tier One have already been identified as having lesser safety impact than those under way and factor into the timeframes allowed to complete them?**

ANSWER:

Yes, there is an appropriate role for the industry and the staff to discuss and identify the resource allocation and the focus shifts that new tasks create. The nuclear industry has formed working groups for routine interactions with the NRC staff and a steering committee to interface with the NRC's Japan Lessons Learned Steering Committee. Industry executives are also invited to participate in public meetings with the Commission. The industry can and has raised resource issues with the NRC using all of these avenues of communication. The NRC will continue its interactions with the industry and other stakeholders to remain aware of resource constraints and to consider them in how work is prioritized and scheduled. The NRC must balance the need to ensure timely implementation of safety improvements with the practical limitations of available resources for both the agency and the industry.

QUESTION 7 **With regard to emergency powers, the requirements of the law are clear and unambiguous, but the former Chairman introduced ambiguity. Have you delineated the specific actions expected of a Chairman or an Acting Chairman in the event that emergency powers are needed?**

ANSWER:

Reorganization Plan No. 1 of 1980 sets forth the basic legal requirements regarding the Chairman's exercise of emergency functions. Section 3(a) of the Reorganization Plan transfers "to the Chairman all the functions vested in the Commission pertaining to an emergency concerning a particular facility or materials licensed or regulated by the Commission, including the functions of declaring, responding, issuing orders, determining specific policies, advising the civil authorities, and the public, directing, and coordinating actions relative to such emergency incident." Section 3(c) of the Reorganization Plan then provides: "To the maximum extent possible under the emergency conditions, the Chairman or other member of the Commission delegated authority [to exercise emergency powers], shall inform the Commission of actions taken relative to the emergency." Section 3(d) also states that "[f]ollowing the conclusion of the emergency, the Chairman [or other Commissioner to whom emergency authority was delegated] shall render a complete and timely report to the Commission on the actions taken during the emergency."

If it becomes necessary during my chairmanship to declare an emergency and invoke the use of emergency powers, I will notify my Commission colleagues immediately. Throughout the duration of such an emergency event, I will make every effort, as emergency conditions allow, to keep my Commission colleagues informed as the agency's response unfolds and utilize their

expertise when assessing potential emergency-response actions. Once I have ceased exercising my emergency authority, I will promptly notify them and provide a complete and timely report. I would expect any Acting Chairman I designate to do the same.

QUESTION 8

An ambitious schedule has been set for addressing the deficiencies found by the Court in the Waste Confidence rule. You also indicate that you will be reallocating resources to support this schedule. We applaud your intent but there are several concerns that need to be explored.

There are important efforts on-going within the Agency and other renewed efforts pending the resolution of other Court cases and pending decision by DOE in the near term. The Court case is the decision that is pending regarding expenditure of remaining funds on the Yucca Mountain application. The DOE initiatives are plans the Department and the Administration may adopt pursuant to the recommendations of the Blue Ribbon Commission (BRC). Also DOE intends to announce the selection of two applicants for awards for small modular reactor (SMR) development.

- a. Can you assure us that funds and resources that remain for the Yucca Mountain application cannot and will not be diverted to the Waste Confidence rulemaking?
- b. Can you assure us that funds and resources that would be used for SMR development, especially for the selectees of the FOA program, are preserved?
- c. Can you assure us that you will be able to support the administrative actions the Department will make from its program resulting from the BRC recommendations as they concern Consolidated Fuel Storage?

- d. Can you assure us that you are putting safeguards and performance measures in place as you reallocate resources to preclude an agency-wide delay in regulatory and licensing matters that will be attributed to the Waste Confidence undertaking?**
- e. Can you assure us that safety and inspection programs will continue to be robust?**
- f. And finally, can you assure us that your task in fixing these deficiencies gives you appreciation for the reality of the management challenge of cumulative effects?**

ANSWER:

a. Funds that Congress appropriated to the NRC in recent years from the Nuclear Waste Fund were specifically for the purpose of funding the NRC's review of the Yucca Mountain application. Because federal law requires agencies to apply appropriations "only to the objects for which the appropriations were made," 31 U.S.C. § 1301, the NRC's remaining unobligated balance of these funds cannot and will not be diverted to the Waste Confidence rulemaking or be used for any other purpose. The NRC suspended the Yucca Mountain licensing proceeding on September 30, 2011, and has not made any carryover funding from the Nuclear Waste Fund available for obligation through the NRC's administrative control of funds process after that date. The Waste Confidence rulemaking is being funded from NRC's regular appropriations.

b. Over the last four years, the NRC has been taking steps to make certain we are fully prepared to undertake the review of licensing applications for the Small Modular Reactor designs. We have tailored our program to be responsive to the applications that we reasonably

can expect to receive, and our budget requests have been consistent with our program development. We fully expect to execute these licensing review activities consistent with our budget requests, modified only by the actual submittal schedules from the vendors.

c. The NRC is coordinating closely with the U.S. Department of Energy to ensure that we are aware of any actions it plans to take in response to BRC recommendations. NRC reviewed and approved the license application for Private Fuel Storage (a planned but not constructed consolidated spent fuel storage facility) and is confident that the lessons learned during this extensive review effort can be applied to the review of any Consolidated Spent Fuel Storage site. The NRC's basic regulations, guidance, and regulatory infrastructure are in place and can be used to accommodate the potential national policy changes related to BRC recommendations for centralized storage.

d. The Commission, in an order issued on August 7, 2012, stated that it would not issue licenses dependent upon the Waste Confidence rule until the Court's remand is appropriately addressed. Although the issuance of final licenses may be delayed in some instances because of the DC Circuit's decision, the resources devoted to addressing the Waste Confidence Rulemaking in response to the Court decision should not impact other agency regulatory and licensing efforts.

e. Safety licensing and inspection programs are two of NRC's major activities. The NRC will maintain licensing and inspection program performance consistent with the agency's mission.

f. The NRC takes seriously the management challenges posed by cumulative effects of regulations (CER). NRC has implemented, and continues to consider additional changes to agency rulemaking practices to address CER concerns.

QUESTION 9 **What is your view as to the adequacy of the time afforded to licensees to comply with the initial set of post-Fukushima orders?**

a. Do you have concerns that the cumulative effects of complying with those orders by the times established could distract licensees from other important safety issues?

ANSWER:

The Commission and NRC staff carefully considered the required timeframes associated with implementing the post-Fukushima orders before they were issued. Public and industry input was a significant part of this process. The NRC must balance the need to require implementation of safety improvements in a reasonable timeframe with consideration of the impact on resources. As a safety regulator, the NRC considered the time afforded to licensees to comply with the post-Fukushima orders to be reasonable and fair, but the NRC would be concerned if presented with evidence that licensees were being distracted from other important safety issues. For potential future actions, the NRC will again engage stakeholders to understand potential impacts and use those considerations to inform the decision-making process.

QUESTION 10 **My understanding is that NRC licensees meet adequate protection for fire protection. Would you like to expand on how the NRC approves, reviews, and monitors licensee plans and performance?**

ANSWER:

The NRC has separate processes for approving changes to nuclear power plants' licensing bases and monitoring the performance of nuclear power plants. The licensing basis of the plant is established through the initial licensing process and is subsequently modified as necessary through orders, license amendments, and license conditions. Changes to a plant's licensing basis requiring NRC review and approval are typically submitted to the NRC in the form of a license amendment request. Alternatively, changes to the licensing basis can be made through a request for an exemption from compliance with the NRC's regulations, which may be approved through a process separate from the license amendment process. Under NRC regulations, the Commission may grant exemptions that are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. The Commission will not consider granting an exemption unless special circumstances, described in 10 CFR 50.12(a)(2), are present.

In addition to the day-to-day monitoring by the Resident Inspectors, the NRC monitors licensee performance for nuclear power plants through the NRC's Reactor Oversight Process. The Reactor Oversight Process uses a variety of tools to monitor and evaluate the performance of commercial nuclear power plants. The process is designed to focus on those plant activities most important to safety. In the fire protection area, the Reactor

Oversight Process relies on the results of quarterly, annual, and triennial fire protection inspections of nuclear plants and other indicators of plant performance.

QUESTION 11 **What are some examples for the reasons behind giving fire protection exemptions?**

ANSWER:

During the development of the Fire Protection Rule (10 CFR 50.48), the NRC staff acknowledged that exemptions from the regulations would be necessary for a number of reasons. A common exemption concerns a section of the regulation (10 CFR 50, Appendix R, Section III.G.3.b) that requires the installation of fixed fire suppression capability in a plant's main control room, which is classified as an alternative shutdown area. In this case, the staff determined that, because the control room was continually staffed and the inadvertent operation of such a system could complicate plant shutdown, plants could be exempted from this requirement. The NRC will not grant an exemption unless it concludes that there is no undue risk to public health and safety.

A listing of all exemptions is publicly available through the NRC's Web site.

QUESTION 12 **If compensatory measures for fire protection are utilized, are these measures adequate to protect health and safety?**

ANSWER:

The NRC has concluded that appropriate compensatory measures provide adequate protection to ensure the health and safety of the public. All U.S. nuclear power plant licensees are approved to use compensatory measures when fire protection equipment is out of service or in the interim while a violation of regulations is being corrected.

When a licensee is using compensatory measures, NRC inspectors verify the adequacy of those measures and ensure that the measures are maintained until compliance is restored.

Senator BOXER. Thank you, Madam Chairman.
Hon. Kristine Svinicki.

**STATEMENT OF HON. KRISTINE L. SVINICKI, COMMISSIONER,
U.S. NUCLEAR REGULATORY COMMISSION**

Ms. SVINICKI. Thank you, Chairman Boxer, Chairman Carper, Ranking Member Barrasso, and members of the Committee, for the opportunity to appear before you today at this oversight hearing to examine NRC's implementation of recommendations for enhancing nuclear safety.

I would like to begin by recognizing the commitment of the Commission's new Chairman, Dr. Allison Macfarlane, to forging a collegial relationship with each member of the Commission, consistent with her stated approach of maintaining open lines of communication with her colleagues on all matters facing the agency. I am appreciative of her views and perspectives, of her reaching out to me, our fellow Commissioners and members of the NRC senior executive service since her arrival. The tone she is setting is constructive, collegial, and a welcome opportunity to move forward in a positive manner on the many important matters before this Commission.

The tragic events in Japan in 2011 cast the NRC's work into even sharper relief for the American public and once again remind us of the uniqueness of nuclear technology. Chairman Macfarlane has described in her testimony on behalf of the Commission the status of the many activities underway which comprise the NRC's response to the lessons learned arising from the accident at Fukushima. These actions have as their foundation the objective of increasing the capabilities of nuclear power plants to mitigate the effects of beyond design basis extreme natural phenomena.

The NRC continues to evaluate its Tier Two and Tier Three actions and to engage with a diverse set of stakeholders on all of these activities. This work is carried out through the day to day efforts of the women and men of the NRC and along with the Chairman, as she has expressed, I appreciate their sustained commitment to advancing the NRC's mission of ensuring adequate protection of public health and safety and promoting the common defense and security.

Chairman Boxer, Chairman Carper, and Ranking Member Barrasso, I appreciate the opportunity to give this statement and look forward to your questions.

[The responses of Ms. Svinicki to questions for the record follow:]

QUESTIONS FROM SENATOR BARBARA BOXER

QUESTION 1 **The Japanese parliament's investigative commission on Fukushima identified a reluctance to question authority as one of the fundamental causes of the accident. I believe that the NRC and domestic nuclear power plants must have the highest commitment to safety in the world. What actions could help to strengthen the safety culture within the NRC and at U.S. nuclear power plants?**

ANSWER:

The NRC has a longstanding history of promoting a positive safety culture to ensure the agency achieves its mission. The agency has recently undertaken initiatives to focus on continuous improvement of our internal safety culture. Communication is a key element in all efforts to strengthen the NRC's safety culture. We have in place an educational program to communicate to the staff the Commission's vision regarding safety culture. Expectations for an open and collaborative work environment (i.e., an environment that encourages differing views) are routinely communicated by managers and supervisors in a variety of formats (e.g., staff meetings, web pages, newsletters, and postings throughout agency buildings) and are included in orientation and training courses offered to all employees. In addition, to further strengthen our safety culture, the NRC maintains the Differing Views Programs (i.e., the Open Door Policy, the Differing Professional Opinions Process, and the Non-Concurrence Process), and agency-level procedures explicitly prohibit retaliation against employees who engage in the Differing Professional Opinions Process or the Non-Concurrence Process.

NRC employees have participated in the Federal Employees Viewpoint Survey, which was administered in the April/May 2012 timeframe and was designed to measure employees' perceptions of whether, and to what extent, conditions characterizing successful organizations are present in Federal agencies. The survey results were very positive, ranking the NRC first among the 37 largest federal agencies in the categories of talent management and leadership and knowledge management; second in job satisfaction; and third in results-oriented performance culture.

However, the NRC leadership is always looking for ways to improve in this important dimension. In this context, the Comprehensive Plan for Agencywide Review of Safety Culture was transmitted to the Commission by the staff in July 2012. The Plan is designed at a high level to assess and continually improve the NRC's internal safety culture with a focus on the environment for raising concerns; it contains two key components that are being overseen by NRC's Agency Culture Advisory Group. The first main component relies on the results from a recently completed Safety Culture and Climate Survey conducted by the NRC Office of the Inspector General and administered in the August/September 2012 timeframe. The second main component of the plan continues ongoing implementation activities to strengthen the agency's safety culture and the trust environment required to promote openly raising concerns.

The plan identifies additional activities to be undertaken to improve the agency's organizational and safety culture.

With regard to strengthening safety culture at U.S. nuclear power plants, the NRC incorporated safety culture into the Reactor Oversight Process in 2006, and results to date show that the program is effective. The NRC's 2011 Safety Culture Policy Statement, developed over a three-year period with extensive outreach to stakeholders, expresses the Commission's expectation that all organizations performing regulated activities consider the importance of developing and maintaining a positive safety culture. The Policy Statement defines safety culture as "the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment." This policy includes an expectation that U.S. nuclear power plant licensees will continue their efforts to develop and maintain a safety conscious work environment in which employees are encouraged to speak up when they have safety concerns. The Commission has directed the staff to continue to engage with stakeholders to communicate the contents of the Policy Statement, to educate stakeholders, and to ensure they have the necessary support to effectively employ the Policy Statement as they deem appropriate. This has included the NRC's development of educational "tools" such as brochures and a set of actual case studies representing a breadth of industries, including energy, medical, and transportation.

QUESTION 2 **How has the NRC considered demographic changes, including population change around nuclear power plants, in its decisions to extend their licenses?**

ANSWER:

The NRC performs a license renewal environmental review to consider the environmental effects of operating a nuclear power plant for an additional 20 years. The Commission determined that the NRC would prepare a supplemental environmental impact statement (EIS) for each license renewal action to fulfill its responsibilities under the National Environmental Policy Act (NEPA). This review includes the effects of continued reactor operations on the population living within 50 miles of the nuclear power plant. The NEPA analysis must use the latest census data to account for recent population and demographic changes.

The license renewal environmental review focuses on environmental impacts of extended operations. The safety review for license renewal focuses on the management of aging plant systems, structures, and components within the scope of Part 54 of the Commission's regulations. The management of the aging of those systems, structures, and components is analyzed in a safety evaluation report (SER), which is published before the renewed license is issued.

Safety issues associated with ongoing reactor operations are not tied to the license renewal decision, but are issues that need to be dealt with continuously as part of a nuclear power plant's current (and renewed) operating license. Anytime issues related to public health or safety are discovered at a nuclear plant, they are addressed immediately and any safety-related changes are incorporated under the current operating license. Emergency planning issues are related to ongoing reactor operations.

Although the Commission has determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal, each plant owner is required to participate in an exercise testing its emergency response plan with the NRC, FEMA, and offsite authorities at least once every two years to ensure that State and local officials remain proficient in implementing their emergency plans and that the population surrounding the plant is protected. As such, the NRC, through required exercises, reviews existing emergency preparedness plans throughout the life of all nuclear power plants, keeping up with the changing demographics and other site-related factors.

QUESTIONS FROM SENATOR JAMES INHOFE

- QUESTION 1** **What is your view as to the adequacy of the time afforded to licensees to comply with the initial set of post-Fukushima orders?**
- a. Do you have concerns that the cumulative effects of complying with those orders by the times established could distract licensees from other important safety issues?**

ANSWER:

The Commission and NRC staff carefully considered the required timeframes associated with implementing the post-Fukushima orders before they were issued. Public and industry input was a significant part of this process. The NRC must balance the need to require implementation of safety improvements in a reasonable timeframe with consideration of the impact on resources.

As a safety regulator, the NRC considered the time afforded to licensees to comply with the post-Fukushima orders to be reasonable and fair, but the NRC would be concerned if presented with evidence that licensees were being distracted from other important safety issues. For potential future actions, the NRC will continue to engage stakeholders to understand potential impacts and use those considerations to inform the decision-making process.

QUESTION 2 **My understanding is that NRC licensees meet adequate protection for fire protection. Would you like to expand on how the NRC approves, reviews, and monitors licensee plans and performance?**

ANSWER:

The NRC has separate processes for approving changes to nuclear power plants' licensing bases and monitoring the performance of nuclear power plants. The licensing basis of the plant is established through the initial licensing process and is subsequently modified as necessary through orders, license amendments, and license conditions. Changes to a plant's licensing basis requiring NRC review and approval are typically submitted to the NRC in the form of a license amendment request. Alternatively, changes to the licensing basis can be made through a request for an exemption from compliance with the NRC's regulations, which may be approved through a process separate from the license amendment process. Under NRC regulations, the Commission may grant exemptions that are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. The Commission will not consider granting an exemption unless special circumstances, described in 10 CFR 50.12(a)(2), are present.

In addition to the day-to-day monitoring by the Resident Inspectors, the NRC monitors licensee performance for nuclear power plants through the NRC's Reactor Oversight Process. The Reactor Oversight Process uses a variety of tools to monitor and evaluate the performance of commercial nuclear power plants. The process is designed to focus on those plant activities most important to safety. In the fire protection area, the Reactor Oversight Process relies on the results of quarterly, annual, and triennial fire protection inspections of nuclear plants and other indicators of plant performance.

QUESTION 3 **What are some examples for the reasons behind giving fire protection exemptions?**

ANSWER:

During the development of the Fire Protection Rule (10 CFR 50.48), the NRC staff acknowledged that exemptions from the regulations would be necessary for a number of reasons. A common exemption concerns a section of the regulation (10 CFR 50, Appendix R, Section III.G.3.b) that requires the installation of fixed fire suppression capability in a plant's main control room, which is classified as an alternative shutdown area. In this case, the staff determined that, because the control room was continually staffed and the inadvertent operation of such a system could complicate plant shutdown, plants could be exempted from this requirement. The NRC will not grant an exemption unless it concludes that there is no undue risk to public health and safety.

A listing of all exemptions is publicly available through the NRC's Web site.

QUESTION 4 **If compensatory measures for fire protection are utilized, are these measures adequate to protect health and safety?**

ANSWER:

Yes, the NRC has concluded that appropriate compensatory measures provide adequate protection to ensure the health and safety of the public. All U.S. nuclear power plant licensees are approved to use compensatory measures when fire protection equipment is out of service or in the interim while a violation of regulations is being corrected. When a licensee is using compensatory measures, NRC inspectors verify the adequacy of those measures and ensure that the measures are maintained until compliance is restored.

Senator BOXER. Thank you, Commissioner.
Commissioner Apostolakis.

**STATEMENT OF HON. GEORGE APOSTOLAKIS, COMMISSIONER,
U.S. NUCLEAR REGULATORY COMMISSION**

Mr. APOSTOLAKIS. Chairman Boxer, Ranking Member Inhofe, Chairman Carper, Ranking Member Barrasso, good morning.

After a major accident like the one in Fukushima, it is natural and proper to focus on the engineering lessons learned and related actions to improve the safety of nuclear power reactors. As you know, the NRC is actively doing this. However, as more in-depth assessments of the accident are carried out, the significance of an additional contributor to the accident emerges—namely, safety culture.

For example, the Chairman of the Japanese parliament's investigation commission on Fukushima lists a reluctance to question authority as one of the fundamental causes of the accident. Major accidents in the nuclear industry have involved organizational failures and/or poor human performance that in retrospect could be considered a result of a weak safety culture.

In 1989 the Commission first published a policy statement to make clear the Commission's emphasis on a safety first focus with respect to the conduct of nuclear power plant operations. In June 2011 we issued a new safety culture policy statement that applies more broadly to all users of radioactive materials. We defined nuclear safety culture as "the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment."

It is recognized that core values cannot be regulated. However, we do have regulations and programmatic incentives to encourage behaviors that are consistent with a positive safety culture. For example, the NRC demands that licensee and contract employees be free to raise safety concerns without fear of reprisal, encourages self-identification of violations, and assesses licensee performance to identify root causes of violations that may indicate weaknesses in safety culture.

To help with the overall efforts in this area, we have identified nine personal and organizational traits that we expect to see in a positive safety culture. For example, one trait is that issues potentially impacting safety are promptly identified, fully evaluated, and promptly addressed and corrected, commensurate with their significance.

We have undertaken an extensive educational program to communicate to the licensees the Commission's vision regarding safety culture. I am pleased that the industry has also developed methods for assessing safety culture. Thank you.

Senator BOXER. Thank you so much.
Commissioner Magwood.

**STATEMENT OF HON. WILLIAM D. MAGWOOD, IV,
COMMISSIONER, U.S. NUCLEAR REGULATORY COMMISSION**

Mr. MAGWOOD. Thank you, and good morning, Chairman Boxer, Chairman Carper, Ranking Member Barrasso. Thank you for today's hearing, and thank you for your continued oversight. It has been very important to us.

It has now been 18 months since the tragic events in Japan. Since that time, the Nuclear Regulatory Commission has conducted thorough reviews of U.S. nuclear power plants and our regulatory framework. We have begun the task of reassessing the flooding and seismic hazards facing each nuclear power plant in the United States and the ability of those plants to cope with severe natural events.

We have taken many other actions that the Chairman has detailed in her written statement, including orders that require licensees to develop strategies to cope with site-wide beyond design basis disasters.

After all we have learned from the disaster in Japan and from our work over the last year and a half, my confidence that U.S. nuclear power plants are being safely operated has only increased. Nevertheless, we are applying the lessons of Fukushima to establish and enhance the level of safety for U.S. plants. Given the consequences of nuclear accidents such as that experienced in Japan last year, we must do no less.

Over the last year, I have met with regulators from around the world and visited several overseas reactors. Also, at Chairman Macfarlane's request, I recently led a U.S. delegation to a meeting of the Convention on Nuclear Safety attended by 63 countries, which focused entirely on the lessons of Fukushima. Through these interactions, I have found that all countries are learning essentially the same lessons from last year's disaster and are taking essentially the same steps in response. We often use different terms and different methodologies, but the actions taken by the world's regulators are roughly the same. This has only increased my confidence that the actions we have taken are appropriate.

And real action is being taken. I have visited eight nuclear power plants in the U.S. since we issued the post-Fukushima orders earlier this year. Our licensees have purchased new equipment and devoted some of their best engineers to the task of responding to NRC orders. I have had valuable conversations with licensee staff about the installation of new equipment, the procedures and training that they are developing, and the ability of plant operators to deal with new requirements while still maintaining a firm grasp of the fundamentals related to the safe operation of their nuclear power plants.

I am confident the steps we have taken have and will enhance nuclear safety in this country. With these actions underway, the Commission is now turning to complex policy matters that will determine the shape of U.S. nuclear regulation for years to come.

These are very difficult matters. It has, therefore, not been the most gentle of welcomes for Chairman Macfarlane. However, I have appreciated the fact that she has created an atmosphere of open discussion and debate since joining the Commission. I believe this Commission, as it is constituted, is more than equal to the task

ahead, and I look forward to working with my colleagues and with this Committee as we go forward.

Thank you very much, and I look forward to your questions.

[The responses of Mr. Magwood to questions for the record follow:]

Questions from Senator Barbara Boxer

QUESTION 1 **The Japanese parliament's investigative commission on Fukushima identified a reluctance to question authority as one of the fundamental causes of the accident. I believe that the NRC and domestic nuclear power plants must have the highest commitment to safety in the world. What actions could help to strengthen the safety culture within the NRC and at U.S. nuclear power plants?**

ANSWER:

The NRC has a longstanding history of promoting a positive safety culture to ensure the agency achieves its mission. The agency has recently undertaken initiatives to focus on continuous improvement of our internal safety culture. Communication is a key element in all efforts to strengthen the NRC's safety culture. The agency has in place an educational program to communicate to the staff the Commission's vision regarding safety culture. Expectations for an open and collaborative work environment (i.e., an environment that encourages differing views) are routinely communicated by managers and supervisors in a variety of formats (e.g., staff meetings, web pages, newsletters, and postings throughout agency buildings) and are included in orientation and training courses offered to all employees. In addition, to further strengthen the safety culture, the NRC maintains the Differing Views Programs (i.e., the Open Door Policy, the Differing Professional Opinions Process, and the Non-Concurrence Process), and agency-level procedures explicitly prohibit retaliation against employees who engage in the Differing Professional Opinions Process or the Non-Concurrence Process.

NRC employees have participated in the Federal Employees Viewpoint Survey, which was administered in the April/May 2012 timeframe and was designed to measure employees'

perceptions of whether, and to what extent, conditions characterizing successful organizations are present in Federal agencies. The survey results were very positive, ranking the NRC first among the 37 largest federal agencies in the categories of talent management and leadership and knowledge management; second in job satisfaction; and third in results-oriented performance culture.

However, the NRC leadership is always looking for ways to improve in this important dimension. In this context, the Comprehensive Plan for Agencywide Review of Safety Culture is to be transmitted to the Commission by the staff in July 2013. The Plan is designed at a high level to assess and continually improve the NRC's internal safety culture with a focus on the environment for raising concerns; it contains two key components that are being overseen by NRC's Agency Culture Advisory Group. The first main component will rely on the results from a recently completed Safety Culture and Climate Survey conducted by the NRC Office of the Inspector General and administered in the August/September 2012 timeframe. The second main component of the plan is to continue ongoing implementation activities to strengthen the agency's safety culture and the trust environment required to promote openly raising concerns. The plan may identify additional activities to be undertaken to improve the agency's organizational and safety culture.

With regard to strengthening safety culture at U.S. nuclear power plants, the NRC incorporated safety culture into the Reactor Oversight Process in 2006, and results to date show that the program is effective. The NRC's 2011 Safety Culture Policy Statement, developed over a three-year period with extensive outreach to stakeholders, expresses the Commission's expectation that all organizations performing regulated activities consider the importance of developing and maintaining a positive safety culture. The Policy Statement defines safety culture as "the core

values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.” This policy includes an expectation that U.S. nuclear power plant licensees will continue their efforts to develop and maintain a safety conscious work environment in which employees are encouraged to speak up when they have safety concerns. The Commission has directed the staff to continue to engage with stakeholders to communicate the contents of the Policy Statement, to educate stakeholders, and to ensure they have the necessary support to effectively employ the Policy Statement as they deem appropriate. This has included the NRC’s development of educational “tools” such as brochures and a set of actual case studies representing a breadth of industries, including energy, medical, and transportation.

QUESTION 2 **How has the NRC considered demographic changes, including population change around nuclear power plants, in its decisions to extend licenses and ensure safety?**

ANSWER:

The NRC performs a license renewal environmental review to consider the environmental effects of operating a nuclear power plant for an additional 20 years. The Commission determined that the NRC would prepare a supplemental environmental impact statement (EIS) for each license renewal action to fulfill its responsibilities under the National Environmental Policy Act (NEPA). This review includes the effects of continued reactor operations on the population living within 50 miles of the nuclear power plant. The NEPA analysis must use the latest census data to account for recent population and demographic changes.

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Safety issues associated with ongoing reactor operations are not tied to the license renewal decision, but are issues that need to be dealt with continuously as part of a nuclear power plant's current (and renewed) operating license. Anytime issues related to public health or safety are discovered at a nuclear plant, they are addressed immediately and any safety-related changes are incorporated under the current operating license. Emergency planning issues are related to ongoing reactor operations.

Although the Commission has determined that there is no need for a special review of emergency planning issues in the context of an environmental review for license renewal, each plant owner is required to participate in an exercise testing its emergency response plan with the NRC, FEMA, and offsite authorities at least once every two years to ensure that State and local officials remain proficient in implementing their emergency plans and that the population surrounding the plant is protected. As such, the Commission, through required exercises, reviews existing emergency preparedness plans throughout the life of all nuclear power plants, keeping up with the changing demographics and other site related factors.

Questions from Senator James Inhofe

QUESTION 1 **What is your view as to the adequacy of the time afforded to licensees to comply with the initial set of post-Fukushima orders?**
a. Do you have concerns that the cumulative effects of complying with those orders by the times established could distract licensees from other important safety issues?

ANSWER:

The Commission and NRC staff carefully considered the required timeframes associated with implementing the post-Fukushima orders before they were issued. Public and industry input was a significant part of this process. The NRC must balance the need to require implementation of safety improvements in a reasonable timeframe with consideration of the impact on resources. As a safety regulator, the NRC considered the time afforded to licensees to comply with the post-Fukushima orders to be reasonable and fair, but the NRC would be concerned if presented with evidence that licensees were being distracted from other important safety issues. For potential future actions, the NRC will again engage stakeholders to understand potential impacts and use those considerations to inform the decision-making process.

QUESTION 2 **My understanding is that NRC licensees meet adequate protection for fire protection. Would you like to expand on how the NRC approves, reviews, and monitors licensee plans and performance?**

ANSWER:

The NRC has separate processes for approving changes to nuclear power plants' licensing bases and monitoring the performance of nuclear power plants. The licensing basis of the plant is established through the initial licensing process and is subsequently modified as necessary through orders, license amendments, and license conditions. Changes to a plant's licensing basis requiring NRC review and approval are typically submitted to the NRC in the form of a license amendment request. Alternatively, changes to the licensing basis can be made through a request for an exemption from compliance with the NRC's regulations, which may be approved through a process separate from the license amendment process. Under NRC regulations, the Commission may grant exemptions that are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. The Commission will not consider granting an exemption unless special circumstances, described in 10 CFR 50.12(a)(2), are present.

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Oversight Process relies on the results of quarterly, annual, and triennial fire protection inspections of nuclear plants and other indicators of plant performance.

QUESTION 3 **What are some examples for the reasons behind giving fire protection exemptions?**

ANSWER:

During the development of the Fire Protection Rule (10 CFR 50.48), the NRC staff acknowledged that exemptions from the regulations would be necessary for a number of reasons. A common exemption concerns a section of the regulation (10 CFR 50, Appendix R, Section III.G.3.b) that requires the installation of fixed fire suppression capability in a plant's main control room, which is classified as an alternative shutdown area. In this case, the staff determined that, because the control room was continually staffed and the inadvertent operation of such a system could complicate plant shutdown, plants could be exempted from this requirement. The NRC will not grant an exemption unless it concludes that there is no undue risk to public health and safety.

A listing of all exemptions is publicly available through the NRC's Web site.

QUESTION 4 **If compensatory measures for fire protection are utilized, are these measures adequate to protect health and safety?**

ANSWER:

The NRC has concluded that appropriate compensatory measures provide adequate protection to ensure the health and safety of the public. All U.S. nuclear power plant licensees are approved to use compensatory measures when fire protection equipment is out of service or in the interim while a violation of regulations is being corrected. When a licensee is using compensatory measures, NRC inspectors verify the adequacy of those measures and ensure that the measures are maintained until compliance is restored.

Senator BOXER. Thank you, Commissioner.
Commissioner Ostendorff.

**STATEMENT OF HON. WILLIAM C. OSTENDORFF,
COMMISSIONER, U.S. NUCLEAR REGULATORY COMMISSION**

Mr. OSTENDORFF. Thank you, Chairman Boxer, Chairman Carper, and Ranking Member Barrasso, for the chance to appear before you today.

NRC continues to make strong, steady progress in implementing the lessons learned from Fukushima. At the same time, the Commission and our highly talented staff continue to be successful in performing other vital work.

Last July the NRC Fukushima task force concluded that a sequence of events in the United States similar to that experienced in Japan is unlikely, and concluded that there is no imminent risk from continued operation of U.S. nuclear power plants. As I appear and testify before this Committee, I firmly believe those conclusions remain true today. Nevertheless, along with my colleagues, I continue to support our efforts at the NRC to strengthen our regulatory framework where necessary in response to Fukushima.

Days before the March hearing before this Committee, all of my colleagues here to the right, we voted to approve the issuance of three orders for additional requirements to our licensees dealing with action mitigation strategies, containment vent systems, and spent fuel pool instrumentation, based on lessons learned from Fukushima. We also supported information collection and analysis efforts necessary to inform proper decisionmaking.

In the intervening months, the NRC has continued to make significant progress. The staff has developed and issued final implementation guidance on the March orders. The staff has also initiated an advance notice of proposed rulemaking to the station blackout rule, as well as for integrating emergency response procedures. The station blackout rule remains on an accelerated schedule. We need to continue to aggressively pursue these efforts.

Finally, I join my colleagues in warmly welcoming Allison Macfarlane to the Commission. Her collegiality and leadership have already greatly benefited not just the Commission, but our entire agency. She is off to a very, very strong start as Chairman, and we are grateful for that.

I appreciate this Committee's oversight role and look forward to your questions. Thank you.

Senator BOXER. Thank you.

Let me just first say how much I appreciate every Commissioner's comments. I particularly want to home in on what Commissioner Apostolakis said. Because what he said was very critical. He said that after he's examined everything that happened in Japan—and tell me if I state this correctly, Commissioner—that your opinion is there was a lack of a safety culture, that people didn't speak up to authority there, and that was the main problem. Am I correct in summarizing it that way?

Mr. APOSTOLAKIS. Yes, Senator, you are.

Senator BOXER. I believe that is so important. It is what I wanted to hear. Because if you had said, well, it was one man who fell asleep on the job or some woman who walked out of the room, that

would be one thing. But I'm assuming you speak for the Commission on that. Is there any Commissioner who disagrees with this? Speak up now. Does anyone disagree with this, that there was a lack of a safety culture? So there seems to be agreement.

This is a breakthrough for us here. Because it just underscores the importance of your work. And this renewed commitment I hear from all of you, I think I hear from all of you, to move forward, not just with rhetoric, but very specific rules that Commissioner Ostendorff cited, for example, that we must move forward.

And we are facing a situation in California, so I am going to ask you if you each got the packet I gave you of letters from my cities. Yes, you have all gotten that. I hope that I can count on you, perhaps working with the Chairman, to try and address these letters directly and hopefully all of you can agree and you can all sign the same letter.

But I would urge you if you don't, then to write your own letter. Can I get, by showing me a nod, yes or no, that you will in fact work with the Chairman, or if you can't get a community letter together, work individually to make sure that those letters are answered? Thank you. Beautiful.

OK, that is excellent. I will tell my cities. The city of Irvine is very, very sincere in their concern. They ask you to withhold permission to restart the plant until the NRC provides full assurance that Units 2 and 3 will not exhibit any of the current vibration, corrosion, and degradation problems during the remaining 10 years of license operation. So these are very hard letters; they are frightened over there, because there are so many people that live so close to this area. Again, I have said this before, but when they asked the sheriff there if there were to be, God forbid, some tragedy, how could people get away, she said, the highway, and you can't move on that highway, there is one highway, in rush hour.

So we have to consider, in looking at this, the risks that we take if it is not all right. So I will ask unanimous consent to place all of these letters into the record.

[The referenced information was not received at time of print.]

Senator BOXER. Also, the Committee to Bridge the Gap did a report on San Onofre, and they are very concerned. I am going to again ask you if each of you will commit to me to review this report. And after you read it, would you be willing to please meet with my staff so that we can discuss it? Because they go into— this isn't rhetoric, this is page after page of specific worries. Can I get a reading from you all, would you be willing to meet with my staff after this? That is very good. Thank you for that.

And again, if you all, if you meet first, and the Chairman can represent all of you, you don't all have to meet, but I want to make sure that I know where each of you is coming from on this. It is very key.

Chairman Macfarlane, the media has quoted you as saying, "As a geologist, I know that geological knowledge is constantly changing and that understanding the cause of earthquakes is based on 'a dynamic set of knowledge' which requires regular feedback and interaction." So what does this mean for safety licensing and license extension issues at nuclear plants? Do you believe it empha-

sizes the need to regularly review these risks and to consider this updated information in license and relicensing decisions?

Ms. MACFARLANE. I think actually it means that we should consider the updated information when it comes in, and that is the NRC's policy, to consider this information when it comes in.

One of the recommendations from the—

Senator BOXER. Well, when you say when it comes in, I want to take issue with that. Suppose you have a plant that in 6 months is ready for the relicensing, and there is a study underway, it is not yet complete. I would hate to think that, you say, when it comes in, who is responsible for getting it in?

Ms. MACFARLANE. Thanks for the clarification. What I am referring to is, say, for example, if the USGS doesn't update the seismic hazard analysis, then that is something that we should be considering. We shouldn't wait until a plant applies for relicensing; we should consider it right away.

Senator BOXER. OK, so I just want to be clear, because I want to know what my role is. So do you see your Commission as asking them to make these updated studies? Or do you just wait until they do it?

Ms. MACFARLANE. No, in fact we have just done an updated study in the central and eastern U.S. And we did that in conjunction with EPRI and the Department of Energy. We just did a reanalysis of the seismic hazard in the central and eastern U.S., and another one is in progress for the western U.S.

Senator BOXER. We did it, meaning the NRC?

Ms. MACFARLANE. The NRC.

Senator BOXER. Along with the USGS?

Ms. MACFARLANE. It wasn't with the USGS. USGS provided some input. But it was with the Department of Energy and the Electric Power Research Institute.

Senator BOXER. So just that my mind is clear, what you are saying is in your view, before you relicense, you want the most updated information on earthquake safety, if there is a situation where there hasn't been a study in 10 years, you will move aggressively to get the latest information?

Ms. MACFARLANE. Certainly. I also want to point out that actually one of the recommendations from the Japan Near Term Task Force was to update and revise seismic hazards and other natural hazards, look at the updated information every 10 years. So there is a recommendation for periodic review, and I support that.

Senator BOXER. Good. That is excellent. Is there any dissent that that ought to be done before relicensure? Any dissent at all? This would be the moment. OK.

I also think it is important to look at the demographic changes, how does the population change around the plant. Sometimes these areas have a boom in growth; sometimes they don't. But I just would urge you to look at all these factors.

Senator BARRASSO.

Senator BARRASSO. Thank you, Madam Chairman.

Chairman Macfarlane, obviously there is a lot going on. You have been there for 2 months now, I am sure you have assessed or tried to assess the internal capabilities and capacity of the staff to successfully complete the Tier One tasks.

My question is can you assure us that the resources that you have aren't being diverted away from fully completing the Tier One recommendations because staff may be, as we say, there is a lot going on, working on other things like the revised waste confidence rule?

Ms. MACFARLANE. Yes, we are adequate there.

Senator BARRASSO. OK. Can you tell me what steps the Commission is taking to ensure that the addition of Tier Two and Tier Three requirements will be issued only after thorough analysis that Tier One recommendations have been thoroughly and successfully completed?

Ms. MACFARLANE. Tier One analyses are fairly far underway. There will be rulemakings that will come out of that. Now as resources and personnel are being opened up we will turn them to Tier Two and again, as the resources become available, the personnel become available, we will move them on to Tier Three.

Senator BARRASSO. You had mentioned also about ongoing rule-making. Can you assure me that other extraneous guidance or other rules that are not vital to protecting public health and safety won't be forced upon nuclear power plants until they have fully completed the Tier One recommendations?

Ms. MACFARLANE. Until they have fully completed the Tier One recommendations?

Senator BARRASSO. Until they focus on that.

Ms. MACFARLANE. There are a number of issues that are before the NRC at the moment, and some are receiving priority, like the waste confidence issue. So we are prioritizing the issues that we feel are most important.

Senator BARRASSO. But you have the resources to work on Tier One in spite of some of the needs for resources for the other?

Ms. MACFARLANE. Yes, we do.

Senator BARRASSO. Great. I understand that the other Commissioners, in your view as to the adequacy of the time afforded to licensees to comply with the initial set of post-Fukushima orders at the time that they have to comply, do any of you have concerns that the cumulative effects of complying with those orders by the time established could distract the licensees from other important safety issues? Are they going to have enough time to comply?

Ms. SVINICKI. Senator, I think of course we need to monitor closely whether or not there is any distraction of focus, that the operators need to be entirely focused on the safety of their facilities. So I'm not aware of any concern at the moment about their ability to carry out the post-Fukushima actions and operate safely. But I think that it is our obligation to watch that closely.

Senator BARRASSO. Anyone want to add to that?

Mr. MAGWOOD. Just very briefly, I agree with Commissioner Svinicki's comment on that. I would add that I think where we are today, I think things are quite good. I have talked to licensees about it; the situation is well under control. I think there is some concern in the licensee community about what might come down the road over the next few years. And I know that the staff is going to be watching very closely to make sure that we stage these things correctly so that the work can be done most effectively.

Senator BARRASSO. Thank you.

Mr. OSTENDORFF. Senator, I would also agree with Commissioners Svinicki and Magwood in their response, and just provide that this is an issue that we are closely watching. We are having a lot of communications. We don't want to see safety significant issues not pursued because of distractions.

Senator BARRASSO. Great, thank you. Any additions?

Mr. APOSTOLAKIS. I do agree with my colleagues. The schedule is very aggressive, it really is, especially for the seismic analyses that are required of the licensees in Tier One and the different analyses. So we have to appreciate that this is a very aggressive schedule.

Senator BARRASSO. Thank you.

Chairman Macfarlane, in my home State of Wyoming there is an abundance of domestic uranium. Yet the permitting of these sites has met with a lot of bureaucratic delay and red tape. These sites provide good paying jobs for folks in our State and other States where uranium is found. How if at all is the licensing of uranium mining going to be affected given some of your statements about the lack of staffing for Tier Two recommendations and the 24-month suspension of licensing and relicensing for new nuclear plants?

Ms. MACFARLANE. I don't believe it will be affected.

Senator BARRASSO. Can you ensure the Committee that everything is on track, including the staff and the resources for the timely processing, then, of uranium mine leases?

Ms. MACFARLANE. Yes.

Senator BARRASSO. Thank you.

Thank you, Madam Chairman.

Senator BOXER. Thank you so much, Senator.

Senator CARPER. Thank you.

Let me just ask, who among you is, who on the Commission is closest to what is going on in Japan, in the prefecture, the areas around Fukushima? Can you give us an update on the status of the clean up there, how it is affecting the people there? Just give us a feel for the future of the nuclear industry in Japan. And the steps that they are taking to establish the kind of cultural safety that Commissioner Apostolakis was talking about. Who is best prepared to do that?

Ms. MACFARLANE. Well, let me give you my brief understanding, and then I might turn to Commissioner Magwood, because he spent a lot of time there and has many close colleagues there.

My understanding is that the government of Japan is in the process of making some very hard decisions about the future of nuclear power in the country. And I think in the next few months, we will see where they are going. At the same time, they are in the process of standing up a nuclear regulator. I understand that that is moving forward. They are in the process of populating a commission similar to ours. And that should be done within, I imagine, weeks.

In terms of the Fukushima site, they are moving forward with beginning to think about taking the fuel out of the Unit 4 spent fuel pool, and stabilizing that building. Many of the events there, or activities there, will have to wait until some of these plants cool down and become less radioactive.

Let me turn to Commissioner Magwood.

Mr. MAGWOOD. I can offer a few things. The Chairman's assessment is essentially correct.

I would add a few things. First, at the Fukushima site itself, it is very difficult to overstate how difficult the work is going to be at that site. There will need to be new technologies, new methodologies created to enable them to clean this site up. And some of these technologies don't yet exist. So there is a long way to go.

However, from all the information that I have seen, the site does seem to be stabilized. The work is proceeding. They are continuing to keep the reactors cool and to treat the water they are using to cool the reactors. So that situation is stable. But there is a long, long way to go.

The establishment of the new regulator is something that, quite frankly, one might have liked to have seen happen much sooner. But they have reached that point now. They have identified commissioners parallel to ourselves who will lead this new agency. I have seen the names and the roster of the people; they look like good people. They look like good people, so that is very encouraging.

And the situation in the country is very difficult. The government, the regulators, the operators, all lost the confidence of the public. We have seen that in the form of demonstrations in the streets of Tokyo. So the fact that the Japanese government is now faced with a very, very hard decision about the future of nuclear power is a direct consequence of that loss of faith. That is something that, once you lose it, it is very difficult to build it back. We are watching the situation very closely because we have so many connections with Japan. All we can do is wish them the best.

Senator CARPER. Thank you very much for those responses.

I have a question, if I could, for the Chairman. I believe that our nuclear power plants are not required to submit their plans on how they intend to comply with the recent NRC orders until early next year. Is that true?

Ms. MACFARLANE. Sorry, I didn't hear the beginning of your question.

Senator CARPER. I believe that our nuclear power plants are not required to submit their plans on how to comply with the recent NRC orders until the early part of next year. My question is, is that true?

Ms. MACFARLANE. I think yes, it is the early part of next year, and the end of this year.

Senator CARPER. Since the NRC has issued the three orders, could you briefly—and we talked about this a little bit, I just want to come back to it again, but can you just briefly tell us whether any of the operators have begun to make changes to satisfy these new orders at their nuclear power plants, and if so, what problems, if any, have they run into so far?

Ms. MACFARLANE. Thanks for the opportunity. Yes, they have actually begun to institute changes. They have been buying additional equipment, additional diesel generators, in the case of a loss of offsite power, and additional pumps that they are staging around the sites themselves and offsite as well. And they are beginning their seismic and flooding walkdowns.

When I have met with licensees I do ask them, what are you learning from your seismic and flooding walkdowns. So far they report that they haven't encountered any problems with this.

Senator CARPER. OK, good.

Commissioner Svinicki, if you could, do you have any sense of the response so far from the public regarding these orders?

Ms. SVINICKI. Well, NRC has done extensive public meetings and outreach where we have explained the orders. We also had development of the guidance for their implementation that involved a series of meetings that were open to the public. I'm not aware of specific public concerns that were raised about how the orders were structured or the implementation guidance.

Senator CARPER. All right.

We are going to have a second round, aren't we?

Senator BOXER. Yes.

Senator CARPER. OK, thanks so much.

Senator BOXER. Senator Alexander.

Senator ALEXANDER. Thanks, Madam Chairman. Excuse me for leaving. But I'm glad to have the chance to come back.

Mr. Magwood, I'm trying to evaluate in my own mind, I mentioned earlier that Sweden has this combination of nuclear and hydro power. Other countries have a different mix, they have renewable energy, which is intermittent, like wind is intermittent. It blows some of the time, and you can't store it.

I am trying to evaluate the effect of government policy on nuclear power of the government subsidies of wind power, for example. The government subsidy of wind power is 3.4 cents per kilowatt hour before tax. In the Midwest, the wholesale cost of electricity is less than that, 2.8 cents. So basically the government is paying the wind producer more than it costs to buy and sell electricity, so I suppose you could slip a little cash under the door of the utilities and pay them to take the wind power. But then what would they do with their nuclear plants?

How easy is it to turn a nuclear plant off and on? Let's say the wind blows at night but doesn't blow during the peak hour, and you need the reliable power? How easy is it to do that?

Mr. MAGWOOD. It is not. It is not. Nuclear plants are not designed to load follow, which is the term that is used to describe what you are talking about. Nuclear plants are designed to operate 24 hours a day, 7 days a week, for a year and a half to 2 years at a time without stopping. And they work best in that sort of operation. There are discussions that the new small modular reactors might be able to do some of this load following. But for our current fleet of nuclear plants, they are not designed to operate that way.

Senator ALEXANDER. So we shut them down on purpose every so often for maintenance, right, what is that, 18 months or so?

Mr. MAGWOOD. It depends on the plant, but usually it's either 18 months or 24 months.

Senator ALEXANDER. So in a mix of energy generation, if you have a nuclear plant, your goal would be top rated, all the time, except when you close it down for maintenance or for some safety problem?

Mr. MAGWOOD. Correct.

Senator ALEXANDER. You mentioned the small modular reactors. Madam Chair, is the NRC planning to continue budgetary support for small modular reactor licensing activities?

Ms. MACFARLANE. The NRC is doing some pre-application activities, pre-design certification activities in terms of small modular reactors. We were informed by the industry, we were expecting our first small modular reactor design certification applications to come in about a year from now. So we are ready to meet that need.

Senator ALEXANDER. Can you assure me that—we have worked pretty hard and came to an agreement to try to fund to assist with this project with the corporations over a 5-year period of time. Senator Feinstein and I are ranking on the Appropriations subcommittee that does that. Can you assure me that the money that we allocated for the small modular reactor program will be used for that purpose and not some other purpose?

Ms. MACFARLANE. Yes.

Senator ALEXANDER. Good.

What impact does the court's waste confidence ruling have on your ability to move forward with licensing a small modular reactor?

Ms. MACFARLANE. At this point in time it should have no impact. The waste confidence decision issues that we have dealt with so far indicate that licensing activities will continue.

Senator ALEXANDER. Would you agree with me that—or with many—that whether you are for or against Yucca Mountain, that we need to move forward as rapidly as we responsibly can to identify a repository for used nuclear fuel?

Ms. MACFARLANE. Wholeheartedly.

Senator ALEXANDER. And as far as so-called consolidation sites, the President's commission recommended that we move on parallel tracks to create some consolidation sites for the purpose, for example, of moving used fuel from reactors that have closed. Would you agree that it would be, do you agree with that recommendation to move along parallel tracks?

Ms. MACFARLANE. As a member of that commission, yes, I do endorse that view.

Senator ALEXANDER. So I stated it more or less accurately?

Ms. MACFARLANE. Yes, you did. Thank you.

Senator BOXER. Restate what you said, what the Chairman said was accurate. Restate that.

Senator ALEXANDER. That we, the first part of my question was, whether you are for or against Yucca Mountain, do you agree we need to move forward to find a new repository for used nuclear fuel. And she said yes.

The second part of my question is regarding what I call consolidation sites, places where used fuel from the 104 sites might be moved on its way to the final repository site. And the question was, do you agree with the recommendation of the Commission that while we are looking for a long-term repository, we also should be looking for one or more consolidation sites, which could be used, for example, to move fuel from reactor sites where the plant is closed and the fuel is still there.

Ms. MACFARLANE. Yes, and I said that as a member of that commission, who signed that report out and endorsed that view, I still endorse that view.

Senator BOXER. Thank you. Do you need more time?

Senator ALEXANDER. No, I am through. But I want to make sure—

Senator BOXER. Yes, I just wanted to make sure I understood what the Chairman was saying, that she thinks whether you are for or against Yucca; in my view Yucca is dead. But we went through this the last time, and I am not going to—most of you told me it was dead the last time.

But we do—as we look for another site, your point is, should we, is it wise to look for interim sites, regionally?

Senator ALEXANDER. Yes.

Senator BOXER. Before the final site is selected.

Senator ALEXANDER. Yes. And we have had a lot of discussion about whether to call them interim or not, because in a sense they are not interim. Because the stuff might go there and then go to the final site. But then some other stuff might go to the consolidation site. But yes, that is correct.

Senator BOXER. OK. Well, we will definitely be looking at the Blue Ribbon Commission's recommendations. Thank you for that.

I just was going to say that one of the things that is of grave concern to some States is the moving of this very toxic fuel through their communities. So we will definitely be looking at whether it is best to just let the waste stay where it is in the safest possible way and then move it once, not move it twice. So that is something that I am very open to discussing. But I know in California there was a lot of concern about movement, because certain States won't let the waste go through the States. It was one area where California was just going to get everything. There was a lot of concern in my State. But this is definitely something we are going to look at.

I am going to ask one question about the general issues, but then I am going to focus in on my California issues. So for those people who will find that a little bit State-centric, I will wait until the end to do that. But the one question I did have, it sort of piggy backs on Senator Barrasso. Does the NRC, Madam Chairman, have the resources to implement all the task force's recommendations, including Tier Three, before the 2016 goal?

Ms. MACFARLANE. I believe we do.

Senator BOXER. OK. That is good to hear.

So now I am going to ask some questions that are related to the experience that we are going through in California with the shutdown of San Onofre.

Chairman Macfarlane, the tubes on steam generators act as a barrier to the release of radioactivity that could endanger workers and the public if the tubes were to burst. Nuclear facilities have other systems that if they fail could also release radioactive material. Does the NRC automatically require a plant to amend its license if the plant makes a major structural change to one of these systems? Would you support the NRC examining whether plants should go through a license amendment process when they make such major structural changes to a plant?

Ms. MACFARLANE. The NRC has an oversight program that validates the day to day safety of the site. In terms of the steam generators, it is generally a licensee's business decision whether or not to change a generator. I will note that 55 out of 69 pressurized water reactors in this country have actually changed their steam generators.

Senator BOXER. I guess my question, because it is sort of two questions. The first question is, does the NRC automatically require a plant to amend its license if the plant makes a major structural change to one of these systems?

Ms. MACFARLANE. If a steam generator is changed, under our 5059 process, we allow licensees to change their steam generators without a license amendment, as long as they assure us that they have not introduced any accident scenarios, additional, different accident scenarios into the system. And we don't do a design review of the steam generators.

Senator BOXER. My concern is you have this plant that made this huge change. And it has led to a shutdown. So would you support the NRC examining whether plants should go through a license amendment process when they make such a major structural change? Because right now you've said they don't have to under your rules. Would you take a look at that, you and your fellow Commissioners?

Ms. MACFARLANE. I think we certainly, and the staff will certainly, definitely—they usually do this kind of thing after a situation like this, that we have at the San Onofre plant. We do reflect.

And it wouldn't happen right away; we would have to continue through the process. But we will look and see what lessons we can learn from this and whether we do need to implement any changes. So we will consider this.

Senator BOXER. Well, let me humbly suggest that this not be something that is put on the back burner, Commissioners. Because what is happening now in California is we have lost an important source of power, very important source. And I have to compliment Commissioner Magwood when he said, what happens when the community loses faith. We can't let that happen. And I will tell you, it has been terrible on the utility. They feel terrible about what is happening, and they spent a fortune. How much did they spend, do you remember? It was hundreds of millions, several hundred million dollars were spent. And there is a problem.

So I would like to ask you to not give me an answer today, but at our next oversight hearing I am going to ask if you would consider examining the lessons learned already. We already know what happened. We already know that they didn't have to get a new license to make structural change. And we already know what happened. It was terrible for the people in the community; it was terrible for the utility. And we still don't know exactly why all this occurred. But I don't think you should wait.

And in respect, I would say out of concern for others in our nation, including the utilities themselves, the business people themselves, everybody, because it is already clear that they should have had your expertise take a look at this change. And maybe they wouldn't have found anything. Maybe your great staff wouldn't have found anything.

But I have a lot of confidence in them, as you do, and you all do, that they might have said, just a minute, this is a problem.

So I am going to ask you not now to commit to anything, because I want you to think about it; maybe I am being too cautious. But I feel, we know enough about San Onofre. How many months has it been closed down already? Since the beginning of the year. And this is—I forget the percentage of power that comes out of this, not insignificant. It is pretty significant in the area. So we are missing that, 10 percent maybe, and nuclear is 20. So in that area, it could be as much as 10 percent. So this is serious business.

And I think it underscores—I would say on this Committee, I am one of the people that really is pressing hard every minute to make sure there is safety. Because I do agree with what Senator Alexander said, for sure, that if people—he says every time we have a meeting, people get more confidence in nuclear power. I would say if they were listening to this Committee hearing, they would. I don't think it is true about all the meetings we have had in the past. But I think we are in different ground now, with different leadership now; we are in difference circumstances. But somehow I feel we are all pulling for the same thing. This is important.

And I just would like to see us not sit back when we have already had this problem in California; it is real. And I hope all of you talk about it at your next meeting, when you talk to each other. Maybe there is something you could put in place right now, an oversight review to see when somebody is making a real change that you get to have your good staff look at it. They may not catch a problem, but they may well catch a problem.

I will turn to Senator Barrasso.

Senator BARRASSO. Thank you, Madam Chair. I just have one follow up, continuing on what you were talking about, different leadership, all pulling for the same thing at this time.

To Chairman Macfarlane, there seems to be early evidence of a renewed collegial environment at the NRC. We really do hope that continues. There were a number of issues raised by the Inspector General's report related to the previous Chairman that the Commission hasn't really been specifically asked to address. But I would like to ask a couple of questions.

Since your arrival, have you taken steps to address issues raised by the Inspector General about the previous Chairman's tenure? For example, have you initiated discussions, perhaps, to identify changes to the internal procedures of the Commission, to address the sharing of information, which was a big concern in the Inspector General's report? What kind of agreements have you reached?

Ms. MACFARLANE. Thanks for that question.

I, as Chairman, have been talking to everyone, my fellow Commissioners, certainly, to the staff, to the managers, management in the staff, to all hands meetings, and expressing my values of collegiality and collaboration. I am very dedicated to making sure that all information is available to everyone, that everyone is informed of all issues in a timely fashion. I think I have been working pretty hard to make sure that that happens.

Senator BARRASSO. I think one of the issues raised, not about you, but previously, is that other Commissioners were perhaps not as involved in conducting the agenda setting process, for meeting

the voting process, deadlines, those sorts of things. Have you been working together on those things as well?

Ms. MACFARLANE. Yes, we have. And we had an agenda setting meeting a few weeks ago. I think it went fairly well. I think we came to some decisions as a group there.

So I think so far it is proceeding well. I invite you to ask my colleagues.

Senator BARRASSO. I will do just that, then. Anyone want to make any comments about these sorts of things?

Ms. SVINICKI. Senator Barrasso, I think the simplest way to put it is that Chairman Macfarlane outlined how she intended to approach leadership under her chairmanship, the principles that she would follow, and she has done so. It is just that simple. We did have the agenda session that she just commented on. I remarked to her either in the session or afterwards that I felt it was a more collegial and open discussion as a Commission than we have had in some time. So I complimented her on that.

Senator BARRASSO. Anyone else want to add?

Mr. APOSTOLAKIS. Well, the environment now is great. I think this is to the Chairman's credit.

Mr. MAGWOOD. I meet with groups of the staff quite often. It is interesting how often members of the staff will ask questions of that nature. The response I have taken to giving to staff is that things are very normal.

Mr. OSTENDORFF. I agree with my colleague, Senator Barrasso, and would say, these are not just words from Allison Macfarlane's perspective, they are actions. We have seen concrete steps that she has taken from day one to radically change the environment.

Senator BARRASSO. That is good to hear.

Thank you, Madam Chairman.

Senator BOXER. Madam Chairman, I just got a copy of a letter that was sent before you took over from the staff that says, there are no resources included in the fiscal year 2012 budget and fiscal year 2013 congressional budget justification for Tier Three activities. So what makes you think you have adequate resources? Has there been a change? Have you gotten more resources? Or do you disagree with the staff on that point?

Ms. MACFARLANE. No, I believe that we do have adequate resources that will take us through 2013. We will not be beginning all activities for Tier Three in 2013. So we will have adequate resources.

Some of these resources are personnel, and there are a limited number of personnel who are working on some of the Tier One and Tier activities who will not be freed up until after they are completed those activities. For example, seismologists. There are a limited number of seismologists in this country.

Senator BOXER. You responded before that you would be able to do Tier Three in your response to me before. Your staff here before you got there, July 13, 2012, said there are not sufficient resources. So will you do me a favor? Will you please respond to me in writing? I don't want to throw this at you. This is from Richard Borchardt, Executive Director for Operations. He is sitting right here. I think we need an answer, because your answer does not comport with his letter.

Ms. MACFARLANE. Sure. We would be happy to respond in writing.

Senator BOXER. I would like to be assured that you can do Tier Three with the resources and how you disagree with this assessment.

And also, I think Commissioner Magwood really said something important before the House Energy and Commerce Committee in July. He was asked, what design and manufacturing flaws with San Onofre's steam generators were not detected before the generators were turned on. And you said, "So when you have an outcome that is not satisfactory you have to take a look at the process. I think we should take a look at the process and see if there is something we can improve." And I appreciate that.

So I want to bring that to the Chairman's attention. Because I didn't ask you today for your answer. But it seems to me you could avoid a lot of these problems, when there is a major change to a plant, before the utilities invest hundreds of millions of dollars, there really should be a new reg. So I hope you will take a look at that, and we will discuss it the next time.

Chair Macfarlane, in my opening statement, I talked about the fact that there is an open meeting scheduled in the San Onofre community for October. Is that firm, and is that happening, and who do you expect will be there leading that open process?

Ms. MACFARLANE. The meeting is set for October 9th. We are ironing out the final details of that. And the way that the meeting will go, it will be in two parts. There will be a roundtable discussion with 10 or 12 representatives from a variety of groups. And then the second half will be a public comment period.

Senator BOXER. And who are the Commissioners who will be there?

Ms. MACFARLANE. The Commissioners will not be there. We will have—it will be facilitated by two NRC staff people. There will be the Region 4 regional administrator, I believe, will be there. And there will be a representative from my office as well. I am very dedicated to ensuring that the agency communicates very well with the public.

Senator BOXER. OK, so who will brief all the Commissioners about the results of that hearing? Who will do that? Whose responsibility would that be?

Ms. MACFARLANE. The staff is responsible for doing that. And we will have either somebody from Region 4, the Region 4 office, who was at the meeting come. For example, yesterday the regional administrator from Region 4 came by my office to give me the latest update on the San Onofre facility. And I asked him specifically what was going to happen at this meeting. So we are in very close communication on this issue.

Senator BOXER. So can I just ask Commissioners as a group, would you commit to being briefed by the staff, all of you, not to go but to be briefed by the staff? Did everybody say yes? Yes. Good.

The other point I made in my opening statement is that I want to make sure that your investigation into the problems has been completed and that you are convinced that it is safe to operate that plant. Do I have your commitment that that is your aim, that you will not restart that plant until you believe it is safe?

Ms. MACFARLANE. Yes, absolutely.

Senator BOXER. And that all the Commissioners, if any Commissioner has a problem with the safety, that you will listen to those Commissioners as well?

Ms. MACFARLANE. Absolutely.

Senator BOXER. OK. Let's see, who's next? Jump in here, folks; help me out.

Senator CARPER. I want to thank both of my colleagues for yielding their time to me.

[Laughter.]

Senator CARPER. That will give me a few more minutes to practice saying Apostolakis. That is one of the things I said to the Chairman, Mr. Apostolakis, is that I think I have served long enough in the Senate that I can pronounce your name easily. And names like Svinicki as well, and some of the easier names. But I am getting there.

This is for Commissioner Apostolakis. I am just going to ask if you and Commissioner Ostendorff, first of all, I just want to say, Commissioner Ostendorff spent a lot of years in the Navy in submarines, trying not to be discovered, being very stealthy. I spent a lot of time in the Navy in airplanes, trying to find those stealthful submarines, not so much ours as the Russians.

But when I heard you talking about a culture of safety, Commissioner Apostolakis, it reminded me very much of what we did in the Navy. You had it in the submarines, we had it in airplanes, a culture of safety. Every day, focus every day on safety, safety, safety. And the most important thing we ever did in airplanes was not just to find submarine or fly missions off the coast of Vietnam or Cambodia. The most important thing we were doing was to take off safely, fly safely, come back and land safely. That was it. It was always made clear. So I am very pleased with that culture of safety.

One of the first hearings I ever chaired, Madam Chairman, on our Subcommittee on Nuclear Safety and Clean Air, was a culture of safety. I am pleased to hear that it is going strong.

I want to ask Commissioner Apostolakis and Commissioner Ostendorff, could each of you just briefly tell us what you have heard. We talked about it just a little, but what you have heard from the nuclear industry and other stakeholders regarding NRC's letters requesting information. I just want to come back and talk about that. What have you heard from the industry and other stakeholders regarding the NRC's letters requesting information? Do you believe we will receive the needed information in a timely manner, in a timely manner for the NRC to meet its 2016 deadline?

Mr. APOSTOLAKIS. I have not heard any significant complaints. As I said, there already is an aggressive schedule. From what I understand, I believe the Tier One items except possibly the order on the spent fuel pool instrumentation are safety significant issues. And they will respond, again, within the 5 years of the goal. So I have not heard any complaints. It is very different for Tier Three, though.

Senator CARPER. OK, thank you.

Mr. OSTENDORFF. Senator, I would just add that these requests for information that went out in March are significant requests, very comprehensive, very detailed. They are challenging, I think, for some of the licensees, but they are important for us to make good decisions. So I think the industry is working very hard to comply with the required information in a given time period. I think we are watching it closely, but we are in good shape at this stage.

Senator CARPER. Thanks.

Can I come back to you, Madam Chairman? Currently, the NRC is addressing, I believe, what we all believe to be the highest concerns, and those recommendations are considered Tier One. Can you just give us a little more information on what you believe will be the expected time lines for the lower priority but still important recommendations?

Ms. MACFARLANE. As I think I said earlier, some of the Tier Two activities are already underway for us. And there are a couple of the Tier Three activities that we are already beginning to look into. In terms of a time line, right now we don't have a specific time line, especially for the Tier Three activities. Again, it is a matter of resources and personnel and having the personnel be freed up to move on to the next activity.

Senator CARPER. OK. I have one for Commissioner Svinicki and Commissioner Magwood. The NRC recently decided to suspend granting new and renewed regular licenses, so that the NRC could address the Federal court ruling regarding waste confidence, something we have touched on earlier here today. The NRC also decided that this process could take up to, I think, 24 months, if I am not mistaken. Which new reactor or renewal applications might be affected coming up between say now and 2014? How does the NRC intend to handle these license applications? Are either of you—either Commissioner Magwood or Commissioner Svinicki, are either of you concerned about what this issue might mean for future licensing of either new or existing nuclear power plants?

Ms. SVINICKI. Thank you, Senator Carper. After the court's decision, the Commission determined a path forward. Since the court invalidated one of the legal underpinnings of the issuance of licenses that did require that the Commission no longer—we no longer had the legal basis to issue final licensing decisions. Since the reviews themselves can take multiple years, the Commission did direct that the safety and environmental reviews on other issues could continue in the interim.

And in a parallel track, the Commission directed the NRC staff to undertake the analyses that the court in its decision found were missing or lacking. So we are working to remedy and substantiate the areas that the court's decision found lacking. That process, we have estimated, will take 24 months.

Senator CARPER. OK, thanks.

Commissioner Magwood, do you want to add or take away?

Mr. MAGWOOD. I agree with Commissioner Svinicki's comments. I would simply add that as I look at things that are approaching the licensing space over the next several years, obviously there are some things that will be delayed because of this. But I don't believe there is any major disruption to either plant operation or consider-

ation of new nuclear power plants that will result, if we get this done in a 24-month period.

Senator CARPER. Can I have one more, please? I want to pick on Commissioner Apostolakis again. I think Chairman Macfarlane mentioned hydrogen control in her opening remarks; did you? Well, you should have.

Ms. MACFARLANE. They are in the written statement.

Senator CARPER. I just want to ask Commissioner Apostolakis, her reference to a hydrogen control in her opening remarks—her opening statement, not her remarks—could you explain for those who might be watching or listening to this hearing who might not be familiar with this topic, what does the NRC actually mean by hydrogen control? What is the current practice in the United States? And what is the practice in some of the other countries who currently use nuclear power? Just give us a primer, call it hydrogen control 101.

Mr. APOSTOLAKIS. Well, hydrogen is flammable. So we should not allow the accumulation of hydrogen gas anywhere, because then you will have an explosion or a big fire. And I believe we have a regulation, 50.44, that deals with that issue. And the intent is to prevent the accumulation of hydrogen or if there is hydrogen, to do something about it before it reaches critical mass.

I don't know what other countries are doing; I am sorry.

Senator CARPER. Does anybody else want to comment on that? No?

Commissioner Ostendorff.

Mr. OSTENDORFF. Certainly the buildup of hydrogen, as Commissioner Apostolakis noted, is a concern. In my submarine experience, you don't want the hydrogen to get above 8 percent, and the safety margin factor, you are never allowed to get above 4 percent assuming you only detect it by a factor of 2 error. Just as one example. So we had carbon monoxide hydrogen burners to remove the hydrogen from the atmosphere in the submarine, primarily associated with the ship's battery.

There are hydrogen recombiners that continually burn hydrogen in some of our nuclear power plants that are always functioning to keep it below a certain threshold. Some of the hydrogen that we are talking about from the explosions at Fukushima are associated with Zircaloy reactions. When that Zircaloy fuel became uncovered, high heat situation generated hydrogen. And that was—the inability of the plant to vent that hydrogen led to explosions. This has been a primary emphasis we have had on the reliable venting orders we put out in March for our boiling water reactors Mark I and Mark II.

Senator CARPER. That was good. That was like hydrogen 101 and 102. I thought that was very good, thank you.

Thanks, Madam Chair. I see we have been joined by my neighbor from Maryland.

Senator BOXER. Yes, we are going to call on him right now.

Senator CARDIN. Let me thank Senator Boxer and Senator Carper both for your extraordinary leadership on this issue and related issues. I have been to Chernobyl, so I have seen first-hand the consequences of human error which could have been avoided, and obviously what happened in Japan tested the extremes of a natural cir-

cumstance. We appreciate very much the type of preparations that we are all doing to try to make sure that regardless of the severity of an external factor, we have safe nuclear facilities.

The circumstances in Japan clearly tested our capacity and remind us that we have to manage these risks as best we can. In the State of Maryland we have Calvert Cliffs, which is located less than 50 miles from here by air. Around 3.3 million people live within the 50 miles of Calvert Cliffs. So we have a direct interest, not only in the State of Maryland, but as people who work in the Washington area, to make sure that all precautions are taken.

I want to ask first, Madam Chair, if my entire statement could be made part of the record.

Senator BOXER. Without objection.

[The prepared statement of Senator Cardin was not received at time of print.]

Senator CARDIN. I want to question another potential danger that was recognized several decades ago and the Commission took steps then by issuing regulations, which it is my understanding may to have been fully implemented, and that is the risk from fire at a nuclear plant and the impact it could have on its generation capacity to prevent the appropriate cooling of the nuclear material.

Can you bring me up to date as to where we are on proper protections at our nuclear facilities from the danger of fire?

Ms. MACFARLANE. Sure, thank you very much, Senator, for that question. It is nice to see you again.

Senator CARDIN. It is good to see you. Welcome to the Committee as a confirmed Chairman.

Ms. MACFARLANE. Thank you.

In terms of fire, the staff has issued a fire protection standard and is working with licensees to implement the standard. Many of the licensees are actively involved in the standard. I invite my colleagues to elaborate if they would like to.

Senator CARDIN. Also, if you could comment, because I believe there were regulations issued several decades ago, it is my understanding that not all the power plants are necessarily in full compliance with those requirements.

Ms. MACFARLANE. That is correct.

Mr. APOSTOLAKIS. Fire was identified as a significant contributor to risk a long time ago, 30 years maybe or more. And of course the fire at Browns Ferry in the 1970s sensitized people to it. And at that time the first regulation was issued, the so-called Appendix R to the Code of Federal Regulations, which was very deterministic and based on experience. For example, cable trays should have 20 feet of empty space between the fire barrier and so on.

And that Appendix R turned out to be very difficult to implement, and a lot of the licensees complained. I believe we reached something like granting about 1,000 exemptions. And any time you have 1,000 exemptions that means the rule is not very good.

So then the National Fire Protection Association, a group that participated in that, issued a standard which is now called NFPA-805, which is a combination of probabilistic and deterministic methods more modern than Appendix R. But it is voluntary. And I believe, last time I heard, 55 licensees, or around there, had agreed to do this. Some of them have submitted already their re-

evaluation of the fire risk. Our staff is reviewing those submissions. And I think it is primarily licensees that felt that implementing Appendix R for them was very difficult, or for whatever reason they didn't want to do it.

Senator CARDIN. I would just make this observation to this Committee. You have a responsibility to do everything you can for safety, and this Committee has a responsibility on oversight, and we work together. The tragedy you referred to I believe was in 1970. So it is far removed from the current thought process.

If there were a fire at a nuclear plant that put us at risk, I would expect we would be having a hearing today on the first risks. I don't want to have to have that hearing. I want to make sure that we have in place the precautions that are reasonable to mitigate or eliminate this risk factor. I would just ask that you keep this Committee informed as to how that review is taking place.

It just disturbs me that there are nuclear power plants that are not in compliance with a regulation, or that there are 1,000 waivers that have been issued. You are absolutely right, we need compliance, we need regulations that provide the protection and are achievable.

I would just ask, Madam Chair, that this Committee be advised as to the progress that you are making in this area.

Senator BOXER. Thank you, Senator.

Madam Chairman, the weeks after Fukushima, I wrote to the NRC encouraging you to work transparently, so that information gathered during your reviews of nuclear plants is made available to the public. The NRC has created a Web site. It is called Plant Specific Actions in Response to the Japan Nuclear Accident.

Will you agree to keep that site up to date until all of the plants have implemented the NRC's new safety requirements?

Ms. MACFARLANE. Yes.

Senator BOXER. Is there any objection from other colleagues on that point? Excellent. That is important.

Chair Macfarlane, in February I wrote to the NRC about safety issues at San Onofre plant, including the rapid deterioration of tubes that carry radioactive water. I asked the NRC to comprehensively review and address safety concerns at the plant.

In July the NRC issued an interim report that you were augmenting inspection of the San Onofre plant. What is the NRC's understanding of the causes of the problems at San Onofre, and how will the NRC address all of the safety issues at the plant?

Ms. MACFARLANE. The NRC is still working to understand the causes. We are waiting for the licensee to respond to our confirmatory action letter.

Senator BOXER. Explain what you mean by confirmatory action.

Ms. MACFARLANE. When the problems occurred with the plant, we issued, with agreement from the licensee, a confirmatory action letter saying that they would shut down the facility and work on understanding the root causes of this problem and then develop a way forward. So we are awaiting their response to this letter, where they tell us their understanding of the root causes of this problem.

Senator BOXER. And they have not sent such a letter?

Ms. MACFARLANE. No. And we understand in talking with the licensee, I talked with them 2 days ago, they came by and visited, they told me that they will be sending this letter by the end of the first week in October.

Senator BOXER. Have you heard that they want to startup parts of this plant?

Ms. MACFARLANE. I understand that there are two reactors there, Unit 2 and Unit 3. I understand that Unit 3 will likely be shut down for some time, unspecified. I know that the licensee is planning to remove the fuel from the reactor at Unit 3 this month.

So Unit 2 is the reactor that is in play at the moment, and for which they will respond to the confirmatory action letter with their explanation of what caused the problem with the steam generator tubes, and a way forward.

Senator BOXER. It is my staff's understanding that 2 and 3 have similar problems. Is that your understanding?

Ms. MACFARLANE. Yes, there are similar problems with the tubes. The tubes in 3 had more problems, more significant damage than the tubes in 2.

Senator BOXER. But it is your understanding they have similar problems?

Ms. MACFARLANE. Yes.

Senator BOXER. I am assuming, because the rumors we are hearing is that they plan to start up in October. But you haven't even gotten the letter back?

Ms. MACFARLANE. No. No, that is not correct.

Senator BOXER. So you can say unequivocally that Unit 2 is not going to be restarted by October?

Ms. MACFARLANE. Yes, absolutely. When we receive that letter from them, then we will—it will take us some time, I can't tell you how long, it will take longer than days and weeks, it will be on the order of months, to understand whether they have understood well enough the root causes of the problem and to understand whether—what their plan forward is, if it is going to provide the adequate safety.

We will not let them start up unless we are absolutely convinced that it is safe to operate.

Senator BOXER. Well, that is music to the ears of the people in California. I am very appreciative. Is there any dissension to that from the Commissioners? Well, that is very important.

Chairman Macfarlane—I am sorry, did you wish to comment?

Mr. OSTENDORFF. Thank you, Chairman.

I just wanted to add one comment. I agree with everything Chairman Macfarlane said. But I wanted to highlight, this is a very complex, technical problem. When one of your staff joined me on a visit to the plant on July 22nd, we spent several hours there looking at what they are trying to do to bracket this flow instability problem. I just want to highlight, in echoing Chairman Macfarlane's response, this is a very complex problem. It is one we have not seen before at plants in the United States. And it is one that is going to require significant NRC staff technical evaluation, depending on what the NRC receives from the licensee, and we don't know what this is at this stage.

Senator BOXER. Well, I so appreciate the caution here. And it makes me feel comfortable that you are doing everything to make sure this is safe. That is why I so believe that doing what Commissioner Magwood suggested in front of the House, that we take another look at your regulations. Because what a shame that this money was invested in a way that turned out to be so wrong for the plant. Hundreds of millions of dollars. And that could have been—maybe it could have been stopped, had the NRC staff taken a look at this.

We don't know all the details, but it is a puzzle. Again, as I think about everything that has happened since Fukushima, almost the irony of this situation, and I know that the mindset of the Commissioners, I believe this today, is that this culture of safety has to be the centerpiece of what you do before you restart this plant. It just means everything. I think at the end of the day, it is going to give confidence to people going forward.

So I have just, you will be happy to know, one last question. Chair Macfarlane, the Union of Concerned Scientists has reported that the reactors at Diablo Canyon and San Onofre are out of compliance with the NRC's fire safety regulations and have been for some time now. The Union of Concerned Scientists believes the lack of NRC enforcement of fire safety regulations is one of the biggest threats to nuclear safety in this country. That is a very strong indictment they are making.

Why does the NRC allow plants to keep operating out of compliance with these fire safety rules? That is what the Union of Concerned Scientists says. Do you agree with that? Do you allow plants to keep operating out of compliance with the NRC's own fire safety regulations?

Ms. MACFARLANE. Thank you for the question, and I appreciate the concern that was raised by the Union of Concerned Scientists. Every plant in this country is either in compliance with the fire safety regulations or they have taken approved or compensatory actions.

Senator BOXER. So the NRC has provided them with an alternative to the regulations, is that correct?

Ms. MACFARLANE. I am sorry, can you repeat the question?

Senator BOXER. So the NRC has provided an alternative to the regulations and some of them are operating without being in full compliance with the regulations? And you have given them an alternative?

Ms. MACFARLANE. We have given them potential alternative actions that they can take to make sure that they are safe in terms of a fire. Let me ask Commissioner Apostolakis to elaborate.

Mr. APOSTOLAKIS. As I said earlier, Appendix R was the original regional regulation that led, because of its inadequacies, to this National Fire Protection Association standard. The standard is voluntary. About 55 licensees, again, if my memory serves me, have agreed to enter the standard. And once they enter, they cannot get out.

Now, as they find what may be inadequacies according to the Appendix R, when they are implementing NFPA-805, there is enforcement discretion. We don't penalize them for it, as long as they

tell us what they are going to do about it and by when. These are minor things, and usually there are compensatory measures.

Senator BOXER. There are what? I am sorry.

Mr. APOSTOLAKIS. There are compensatory measures to account for these weaknesses. So it is not that they don't comply with the regulations. There is this period where they would be allowed to take action to correct whatever weaknesses they have.

Senator BOXER. I am confused, I have to admit. Forgive me.

So my understanding is that the NRC has fire safety regulations. Are these regulations or are these just an idea that you are putting out for power plants, if they want to do it they can do it, and if they don't want to do it, they don't have to do it?

Ms. MACFARLANE. No, there are regulations in place.

Senator BOXER. So they are not voluntary?

Ms. MACFARLANE. No.

Senator BOXER. So I don't know how many are on this list here, but there must be 10, 20, 30, 40, how many? Seventeen States, about 31 reactors that are not in compliance. What I am hearing from you is you give them—they come forward before you with other ways to get you before there. And how much time do you give them to comply?

Ms. MACFARLANE. To comply with the regulations?

Senator BOXER. Yes.

Ms. MACFARLANE. Let me turn to Commissioner Apostolakis, or Commissioner Magwood.

Mr. MAGWOOD. I was going to try to give an illustration that might clarify this a bit. Part of the rule, the regulation that fire protection falls under what is called Appendix R in our lexicon. Under Appendix R, for example, we look for the separation of, say, electric control cables. Control cables would have to be a certain distance apart or be protected by some barrier.

An alternative to actually moving the cables further apart might be to station a person at the location or to have a person check every half an hour at that location to make sure there is no fire taking place. That is a compensatory measure. That is the sort of thing a lot of licensees are doing. Those measures can stay in place for quite some time.

Senator BOXER. I understand. Well, from what I know about my own, the reactors in my State, there are some personnel problems there by the handful. Somebody is supposed to be some place they are not; somebody falls asleep.

I just want to say, this is concerning. And I don't think you are all that concerned, all of you, and it is OK, it is a disagreement. I feel you need to get these plants up to code, in terms of, we would not allow this, would not allow this in a lot of areas. I will tell you something, I served as a county supervisor, and you had better pay attention to fire regulations.

I was just at the Democratic Convention, which was great, in parentheses. And you should have seen the fire marshal there, seriously. Whoa. Get out of the aisle; I don't care if you are on CNN, MSNBC, you get out of the aisle. They told Senators and everybody else.

This isn't something we should be giving them compensatory ways to do it, because then you are putting it in the charge of a

human being. And we know human error occurs in the best of people.

So I guess what I would like to do is—not today, because this is kind of the first I have really read of this, and I thank you for this, I would like to work with all of you to figure out a way, A, I think the people in these communities ought to know that their nuclear power plants are not in compliance. Let them start to write letters and say, hey, get into gear here, and fix it up.

I have problems. I have problems in California. I have my two power plants on here. We have enough problems.

So I will tell you that I am going to work with my colleagues on both sides of the aisle in sending you a letter in short order that I think we need transparency, I think you ought to chastise these folks by just having a Web site and say, hey, go up and see who is in compliance; let's have the good list.

This is the thing that always gets me. There are so many people who are doing the right thing here. And then they look over, and they are spending the money making the capital improvements, and then you have people who are putting it off until something happens, and then they will have an excuse. Then they will say, well, the NRC said we could compensate, blah, blah, blah.

And I don't want to get you into that situation. So not today, but in the next few weeks, we will do a letter with some of our colleagues, hopefully on both sides, that just says, please bring the attention of this failure to comply with your own regulations to the people. Because my sense of it is the minute my city councilmen know and my mayors know, they are going to be on the phone to PG&E in the one case and SoCal in the other, saying hey, hey, we don't accept this. This is not right.

So anyway, I don't want to end on a down note at all. I think we can work on this, and I really thank the staff here for all their work on this. We will get this done.

But I just want to say in general, I am really happy to see the cooperation, the respect. You may have disagreements between you, and you know what? That is fine. That is part of what America is about. I don't expect you all to agree. That is why I keep asking, do you agree, do you not. Don't be fearful to disagree with one another. I think it is healthy, too.

But I am so pleased to see the working relationship that is beginning to develop here and that personalities are meshing better. That is extremely important. We all want the same thing, we want safety first. You do, I do, everybody does, whether you love nuclear power, whether you hate wind power, wherever you are coming to.

President Obama has an all of the above strategy. So it all has to be safe. I think most people have an all of the above strategy, and it all has to be safe. Whatever—whether it is natural gas or nuclear, solar, whatever.

So thank you, thank you, I hope you feel as I do that we are all on the same page for now. We may not always be, but we are now. My people in California are counting on you. You stand in such an important place in their lives right now. I mean it, because I don't have the expertise that you are going to have on this California plant. I am going to monitor the public meeting. My staff will be out there.

And I really want to thank my staff—all the staff here, both sides of the aisle—for helping us get ready for today. We stand in adjournment, and we will see you soon. Thank you very much.
[Whereupon, at 11:55 a.m., the Committee was adjourned.]

