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**A Potential Path Toward Improving Emergency Preparedness:
Developing Risk-Informed and Performance-Based Regulations**

Prepared Remarks by

**The Honorable Gregory B. Jaczko
Commissioner
U.S. Nuclear Regulatory Commission**

at the

**Nuclear Energy Institute's Emergency Preparedness and Communication Forum
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Good morning. As you heard in my introduction, I have done work in physics which involved analyzing very small systems. The emergency preparedness work you do is about large and complex systems involving many different agencies and levels of government. These present very different challenges, so I have made the effort to get a fuller understanding of this subject by visiting over a dozen nuclear power plants and meeting with public groups and local officials.

I have come to believe that emergency preparedness serves as a barometer for public confidence in the NRC. After all, it is the area in which our agency most closely interacts with the public and state and local officials. In an emergency, licensees make protective actions recommendations, state and local officials make decisions, and the public reacts. So this is an area that we have to get right. It is important work and you are in many ways the faces of your organizations.

At some of the plants I have visited, I have heard serious concerns that emergency plans will not work. After a detailed review, I have concluded that we have not done a thorough job at the federal level of figuring out exactly what it means for a plan to "work." For instance, I often hear that evacuations would take too long, but I am unable to point to a section of our regulations that explains how long they should take because there is not one.

At a May 2nd Commission meeting I asked a panel of industry, state and local government, and public interest group representatives their understanding of what working means. They all said “protect public health and safety.” And of course that is our ultimate goal and mission. But I believe emergency preparedness is mature enough that we can do a better job of adding more specificity into our regulations about what constitutes an acceptable level of preparedness and response capabilities.

Certainly, we have the 16 planning standards detailed in section 50.47 of our regulations. But as you are well aware, we have thoroughly defined what adequate protection means from a technical standpoint in the operation of a nuclear power plant in deterministic regulations. Most sections of Part 50 of our regulations, for example, are very prescriptive. Just look at 50.46, which defines what it means for an emergency core cooling system to work.

In emergency preparedness, we have requirements for developing and maintaining plans, but not for what they must be able to accomplish. In reality, we do not have deterministic regulations in this area, but rather simply procedural regulations. We need better clarity for all of the different organizations involved to be able to do their jobs.

Before I continue, I want to issue my standard disclaimer: the NRC is run by a Commission of five people. I only get one vote. But here are some of the things I believe need to change to enable the federal government to better support state, local, and licensee radiological emergency preparedness efforts. A local population that wants a better understanding of hazards they face and more confidence that their risks are being minimized is not satisfied by procedural regulations. Licensees, who are always eager for specific and clearly defined regulatory requirements, cannot be fully satisfied with procedural regulations.

Therefore, I propose the start of a new dialogue on this issue. I would like for us to discuss ways to develop a set of attainable radiological emergency preparedness goals and then design steps to measure how well they can actually be met. I believe the best way to do that is to embrace the development of performance-based and possibly even risk-informed emergency preparedness regulations.

The agency has defined performance-based requirements as those that have a measurable or calculable outcome. In general, a performance-based regulatory approach focuses on results as the primary basis for regulatory decision-making. So let us have a discussion about what the standard should be, let us quantify the protection that emergency preparedness plans and procedures should result in, and let us codify them in regulations that are objective and measurable.

I do not know what these new performance-based regulations would look like. They may focus on an evacuation time standard, an amount of dose that should be prevented or a maximum dose that can be received. Because they would be performance-based, licensees and communities would have the flexibility to address their own challenges and develop their own unique solutions – as long as they met the ultimate performance measures.

In reality, it may be difficult to also risk-inform emergency preparedness. Doing probabilistic risk assessments requires data about events and thankfully we have very few emergency events resulting in releases to review. But making the effort to investigate and model these types of events could result in insights that meet my goals for risk-informing – sharpening the focus on safety and fostering a more effective and efficient regulatory process. What this effort may reveal, for instance, is that to ensure

the same amount of protection to citizens around all nuclear power plants, we need to apportion our resources and efforts based upon the size of the EPZ populations.

Having the flexibility to tailor our efforts in such a fashion would be an improvement over the current system which does not adequately recognize that each plant and each community is different. Because our regulations are mostly one-size-fits all, they do not take into account one of the fundamental principles of emergency management that all disasters are local – that each community is unique and local emergency managers must have the flexibility to adopt individual solutions.

While risk-informing our emergency preparedness regulations may pose some challenges, making them more performance-based should be pretty straightforward. Having this dialogue and moving our regulations in this direction will also make it more likely that we could successfully make dramatic changes to protective action recommendations, if we find that necessary in the future. I am thinking here, of course, about the Sandia evacuation and protective action recommendation studies that the NRC has funded over the past few years. The preliminary results of these studies show that in certain emergencies resulting in releases of radiological materials – such as short duration or “puff” releases and/or in communities with longer evacuation time estimates, it may be better for people to shelter in place rather than attempt to evacuate.

There is a widespread perception that radiological emergency preparedness is equivalent to evacuation. Because there is such a belief among many members of the public that evacuation is the best option for a radiological emergency, any discussion about sheltering is seen as an admission that emergency plans will not ‘work’ and rather than focusing on the best way to achieve our common goal of protecting the public, the dialogue ends abruptly and results in a loss of public confidence. By making clear the ultimate performance measures we strive to meet, we are more likely to be able to gain the support of the very people that we need to listen, believe, and follow instructions to shelter in place – if in fact that is the safest course of action for a given scenario.

Just the discussion of this type of proposal will be extremely valuable. Public participation in the debate will allow concerned citizens to have their views heard and considered, and it would provide them with additional information about the efforts undertaken every day by licensees, and state, local, and federal government personnel to keep them safe.

A performance-based and risk-informed emergency preparedness regulatory structure would be more efficient and would free up resources that would allow the agency to take one additional step to strengthen public confidence and ensure adequate protection: performing periodic comprehensive evaluations of radiological emergency preparedness.

The NRC only issues a comprehensive affirmative finding that both onsite and offsite emergency plans are in place around a nuclear power plant, and that they can be implemented, at the time it grants an initial operating license. We do not perform periodic reviews of emergency planning around nuclear power plants for the purpose of making a new finding of a “reasonable assurance of adequate protection of the population.”

The NRC and Department of Homeland Security (DHS) do regularly assess compliance with the plans in place through exercises and reviews, but our agencies do not periodically *reassess* that initial reasonable assurance finding – even it was made decades ago – unless and until we find a serious

deficiency in a biennial exercise. The way the process is established, therefore, the burden is on the government to uncover a problem, and not on the licensee to prove that a capability exists to provide reasonable assurance. This is categorically different from the way the agency regulates other safety issues at nuclear power plants.

Performing a comprehensive review of emergency preparedness at nuclear power plants, especially if it was designed to measure the new performance indicators established in risk-informed and performance-based regulations, would provide the NRC with a crucial opportunity to strengthen public confidence in those plans and procedures. Taking this step would be an acknowledgment of the importance of this capability, and it would honestly reflect the fact that the infrastructure and populations around many plants have changed dramatically in the decades since they began operation. Encouraging public participation in the review would also allow concerned citizens to have their views heard and considered.

I am not sure what frequency such reviews would need to be conducted. Every five or ten years? More often around more densely populated plants? Based upon a trigger such as a 50% change in population size or the development of substantial new infrastructure? All of these ideas could be debated.

At the very least, I believe it would make sense to perform this comprehensive evaluation during the review of a license renewal application. As you know, the process for renewing the licenses of nuclear power plants has been established in such a way that reviews of emergency preparedness are prohibited. I do not believe that was the appropriate policy decision.

I understand the argument that emergency preparedness requirements are in effect at all times. But considering emergency preparedness during the license renewal process would be good public policy and a very valuable exercise. It would provide state and local emergency managers with a forum to raise concerns, analyze and point out the changes that have occurred in their communities over the intervening decades, and suggest improvements to emergency plans.

It also represents a huge opportunity to improve public confidence in the licensees and all levels of government by demonstrating how seriously we take these issues.

I recognize that it is difficult to change this process now – the Commission acted some time ago and our agency has already approved many license renewal requests. But I believe this is an issue the Commission needs to reevaluate.

The vehicle to make the types of changes I have discussed already exists – a years-long comprehensive review of emergency preparedness regulations being performed by the staff that has involved everything from the previously mentioned Sandia studies to extensive and unprecedented public participation. At the conclusion of the effort in the fall, the staff intends to present the Commission with recommendations on how to improve the overall program.

I am hopeful that the Commission will take action at that time to clarify and improve our regulations. And I believe that the NRC is uniquely positioned to take a larger onsite and offsite role as part of this reevaluation of emergency preparedness.

After all, while the Department of Homeland Security does all-hazards work with state and local

emergency managers, the NRC continues to be responsible for onsite REP and for ultimately reviewing DHS offsite findings. It is important to emphasize that the NRC has the ultimate authority and responsibility to ensure the adequate protection of public health and safety around nuclear power plants. We make the determination that the onsite *and* offsite arrangements are in place and can be implemented. If we cannot do this, the Commission has a responsibility to require a plant to cease operation. Because of that enduring fact, and with the strengthening of the NRC's capabilities and expertise in this area, I believe it is time for the pendulum of responsibility for emergency preparedness to swing back from DHS to the NRC a little bit.

The significant changes I have outlined will not be easy to accomplish because emergency planning is a complex and emotional issue. It will require that the NRC continue to interact with our DHS partners and with licensees, and state and local emergency management officials to continue to look for ways to make radiological emergency planning even more effective.

We must address this issue honestly, directly, and with the full participation of stakeholders to strengthen our credibility with the public and ultimately make the job each of us does a little bit easier to accomplish. Together we can make progress and I intend to help improve emergency preparedness for the current fleet of nuclear power plants and for potential future reactors.

Attending forums such as this is one of the ways I attempt to do that because in addition to sharing my ideas with you, today's sessions will give me the opportunity to hear your concerns and recommendations and engage you directly. So, again, I appreciate this opportunity to speak to you this morning and I look forward to today's discussions.

I understand that there will be an opportunity to engage in a further group dialogue with you this afternoon, but I would also welcome any questions you may have now.