Measuring Success in the Fuel Cycle
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Good morning. Allow me to add my welcome to all of our participants here at the Fuel Cycle Information Exchange. This is the 6th FCIX. Each year we attempt to offer a range of presentations on contemporary and relevant topics in fuel cycle regulation. The theme for this year's FCIX is "Collaboration and Information Sharing on the Nuclear Fuel Cycle." These meetings offer an important opportunity for the staff of the NRC to interact with and exchange information and perspectives with stakeholders who are active in fuel cycle regulation.

It is a pleasure for me to join you for this FCIX. This year we welcome John Kinneman as the new director of the Division of Fuel Cycle Safety and Safeguards. John replaces Dan Dorman, who presided over the last two FCIX's in 2009 and 2010 and has been promoted as the Deputy Director of the Office of Nuclear Material Safety and Safeguards. You may not see much of Dan during the next couple of days because he is participating on the Near-Term Task Force conducting a senior-level review of the nuclear emergency at Fukushima-Daiichi in Japan.

Although it is too soon to tell how the nuclear emergency in Japan will impact nuclear regulation, we expect that nuclear power will remain part of the energy mix for the long-term as the world struggles to meet energy needs in a safe, secure, sustainable and environmentally friendly manner.

It is interesting to review how the topics in the FCIX have changed from year to year, as we have adjusted the presentations and themes to match the needs and interests of the stakeholders and the NRC. During the first FCIX in 2006, key topics included safety culture, Global Nuclear Energy Partnership, revisions to the fuel facility inspection program, security and emergency preparedness enhancements, Integrated Safety Analysis, and Items Relied On For Safety (IROFS). By the 3rd FCIX in 2008, the topics had evolved to include the expansion of nuclear power and fuel cycle facilities in the U.S. and abroad, the safety culture pilot, lessons learned from operating experience, licensing new fuel facilities, human resources, recycling, the additional protocol, and the NRC's review of the Hanford Waste Vitrification Project. You may recall that we held a special session that year devoted to the working groups established at the preceding FCIX on various issues associated with the implementation of Part 70.

At the fourth FCIX in 2009, key themes included growth in the international nuclear fuel cycle, new radiation protection issues, proliferation resistance, IAEA safeguards at fuel cycle facilities, construction experience, cumulative effects of regulation, integrated safety analysis, and a full-

day workshop on reprocessing and recycling. The fifth FCIX last year featured a panel of senior executives representing a range of stakeholders, including our French counterpart regulatory agency. Other topics and themes from this FCIX included an update on the status of the products developed by the working groups, fueling advanced reactors, safety culture, and integrated spent fuel management.

Many of these same themes are evident in this year's sixth FCIX. The updates that you hear in this conference reflect the progress by the operators, regulators, and other organizations involved in the nuclear fuel cycle. Sharing and collaborating about this progress is what the FCIX is all about.

Despite these changes, some things have not changed, like the NRC's safety and security mission. Whether nuclear power grows or contracts, our paramount focus on safety and security continues unabated. Our response to the nuclear emergency in Japan has only reinforced our mission of protecting people and the environment. Our response has also reminded us of the importance of designing and operating nuclear facilities considering a range of normal and upset conditions in mind and being ready to and capable of responding if an emergency occurs. Another thing that has remained the same is the industry's desire for fair, consistent, reasonable, timely, and predictable regulation.

That brings me to the focus of my presentation today on "Measuring Success in the Nuclear Fuel Cycle." Like our mission, the importance of the NRC succeeding in accomplishing our mission has not changed. To judge success, we need to define success in a manner that we can determine what is working and what needs to work better. Ideally, NRC and its stakeholders would align on the definition of success.

I'll start by reviewing the framework we use to measure performance, discuss how the NRC implemented this framework, describe how we have historically measured success, and then wrap up by touching lightly on several relevant topics. My objective is two-fold, first to engage you in measuring our performance, and second to provide you with an understanding of how we derive the measures. I also recognize that there is a lot of information on this subject and it does not exist in books on the Best Sellers list. My aim is to distill this information into useful knowledge that you can use to help us "get it right."

I recognize the potential peril associated with discussing this topic at the FCIX for a variety of reasons. There is a fair amount of subjectivity involved in defining and achieving success. Success to one person may represent failure to another, such as the NRC's timely action on a licensing decision or effectively engaging stakeholders in the regulatory process. Success also has a temporal characteristic – what may have seemed like success yesterday may no longer fit the needs and expectations of tomorrow. Our views on success are also influenced by our individual perspectives. As Mark Twain once said, "All you need is ignorance and confidence and the success is sure." In the final analysis, it is important that we and our stakeholders generally agree on what constitutes success and that we use this in measuring our performance. After all, management guru Tom Peters concluded that the old saying "What gets

measured gets done" was some of the most sage management advice he ever heard. I have certainly observed this at the NRC and among the licensees that we regulate. Finally, as an independent regulatory agency that reports to the Congress, we understand that regardless of how we might judge our performance, the 535 members of Congress who represent our great Nation have the final say in how well we are doing. With this in mind, let's proceed with our exploration of measuring success.

Our performance management framework was jumpstarted when Congress enacted and the President signed the Government Performance and Results Act in 1993 or GPRA for short. This law was intended to improve the management of the government by requiring agencies to set goals, measure results, and report progress. These may seem like fairly basic tasks from today's perspective, but at the time they were not uniformly performed across the Federal government and some of these tasks remain challenging today. Promptly after passage, the NRC implemented the law by conducting a comprehensive baseline assessment of the work of the agency and developing a top-down strategic plan. Although the agency's mission was clear, the vision and strategic goals for the NRC had not been previously identified. Development of the strategic plan also provided an opportunity to engage our internal and external stakeholders in the planning process and understand what is important to them. These early discussions were particularly helpful in gaining alignment about what mattered with respect to our mission and our performance. Despite several revisions, the NRC's strategic plan is still rather similar to the first version of the strategic plan issued in 1997.

Once the strategic plan was in place, we cascaded the goals and strategies of that plan down through our operating and performance plans. GPRA envisioned linkage between agency strategic plans and budgets, so in the late 1990s this linkage took shape with the inclusion of performance information in budget proposals. One of the most challenging tasks that we faced early on was developing meaningful and effective performance measures to evaluate the success of our programs in achieving the agency's mission, including our strategic measures which we established for the reactor, waste, and materials program areas.

With our central focus on safety, security, and environmental protection in the use of nuclear material, however, it was difficult for the NRC to develop any measures greater than "zero." No nuclear accidents, no deaths from radiation, no inadvertent criticalities, no significant releases, no loss of strategic special nuclear material, no radiological sabotage, etc. You get the picture. Unfortunately, we found it difficult to gauge progress and program performance by consistently preventing something from occurring. We recognized that we had an obligation to enable the safe use of nuclear material, so we developed lower tier output measures that we could use to measure performance while avoiding the negative consequences deemed unacceptable by the NRC and the American public we serve.

As you see in this slide, the performance measures we have used in the fuel cycle program have evolved from 1994 to the present. We have adjusted the measures based on what we thought was most important and the aspects that our stakeholders would most care about. I'll describe this evolution in the next several slides.

In the years immediately after the passage of GPRA until 1998, the NRC's budget contained no output or outcome performance measures. Instead, the budget proposals largely consisted of descriptions of the activities we would accomplish if Congress provided the resources. The descriptions were activity-based, and included activities like rulemakings, guidance development, license reviews, and inspections. With this approach, agency "success" was judged by meeting the strategic and performance measures, as well as by fulfilling our planned accomplishments. This approach is analogous to a "pass/fail" approach and offered limited utility in measuring the relative performance, especially recognizing that proposed budgets are developed two years before the budget execution year and priorities often change in the interim due to fact of life causes.

Output measures were initially incorporated in the proposed budget for most of the agency programs for fiscal year 1999. The longest running output measure for the fuel cycle program tracks the completion of safety, security, and safeguards inspections. The specific terms of the measure have varied, including tracking the number of inspection modules completed, the number of modules as scheduled, and the percentage of modules completed late. Some of this variation was driven by changes in how we planned, executed, and accounted for the inspections. We also adjusted the measure as we gained experience with applying performance measures and determined what performance was more meaningful to measure. In general, although some years were more challenging than others, we met the performance measure for inspections each year.

In 2001 we added a performance measure to track the timeliness of fuel cycle licensing actions. These measures have also changed over the years as we gained experience with performance management. The initial measure required completion of 75% of licensing reviews within 180 days (other than new and renewal reviews), and 100% of reviews completed within 3 years. In short order, these measures were further compressed to require 80% of licensing reviews completed within 180 days and 100% in 2 years. During some years, we also tracked separately the number of completions of complex and routine licensing reviews and the completion of actions in accordance with the schedules in our operating plans. As with the inspection measure, we generally met the licensing timeliness measures each year, except for 2007 when we came close, but did not meet the measure.

During the last decade, we have also instituted a variety of additional measures to evaluate our performance in the fuel cycle program. These other measures include:

- Completion of public outreach activities, such as the meetings with stakeholders on significant new fuel cycle projects like the proposed Mixed Oxide or MOX Fuel Fabrication Facility at the Savannah River Site in South Carolina.
- Completion of significant environmental reviews required under the National Environmental Policy Act, such as Environmental Impact Statements and significant Environmental Assessments.
- Occurrence of risk-significant precursors.

- Timeliness of enforcement actions.
- Timeliness of allegation reviews.

Through this entire period, comparison of our performance with these measures has consistently concluded that we have met the measures with few exceptions. Consequently, our performance measures indicate that we are succeeding.

Further, in addition to the performance measures, we also track our performance at a finer level of granularity in our fuel cycle program operating plan. This level of review tracks progress against intermediate milestones and deadlines for specific projects and facilities. Performance against these milestones then rolls up to support assessment at higher level output and performance measures. Progress against these measures is reviewed routinely at the branch and division levels in the offices of Nuclear Material Safety and Safeguards, Nuclear Security and Incident Response, Region II, Enforcement, Investigations, Federal and State Materials and Environmental Management Programs, Nuclear Regulatory Research, and other offices that contribute to success in the Fuel Cycle Business Line.

Failure to meet a performance measure does not necessarily translate into a failure of the agency to fulfill its mission. However, if we fail to meet a measure, it prompts closer management scrutiny of our performance. Performance reported to Congress is reviewed at the highest levels of the agency on a quarterly basis. This assessment has identified several challenges that we have experienced in the fuel cycle program, as listed on this slide. I meet with each of the office directors who report to me every quarter to review their office's performance against both program and corporate measures. We draw on this performance information to identify what is working well and to assess the need for corrective actions. We use this information as input to our planning and budgeting process with the expectation that past performance can be a prologue for the future.

We also use this information, both the successes and failures, as part of continuous improvement in our regulatory programs. In the fuel cycle program, continuous improvement can be seen in numerous initiatives, including the recent Lean Six Sigma review that we performed of the fuel cycle licensing program that identified a variety of short-term and longer-term improvements listed on this slide. Another example is the use of the Integrated Safety Analyses to risk-inform our inspection program for the construction of new nuclear fuel cycle facilities. The offices involved in the program routinely conduct lessons learned reviews and self-assessments to identify opportunities for improvement. We also benefit from the watchful eye of the NRC's Inspector General and the Government Accountability Office, who periodically identify additional opportunities for improvement based on audits of the fuel cycle regulatory program. These activities collectively help us to improve our regulatory programs, so that we can accomplish our mission more effectively and efficiently.

You may recall several minutes ago I mentioned the law that jumpstarted our performance management – GPRA. That law has been boosted again at the end of 2010 when Congress enacted the GPRA Modernization Act. This new law shifts attention of Federal agencies away

from just reporting performance results to actually using performance goals and measures to improve effectiveness and efficiency. It also requires quarterly reviews of performance by senior managers, which we have been doing at the NRC for the last decade or more. The law fosters greater cooperation across the government to enhance performance and emphasizes sharing more dynamic, accessible, and useful performance information. At the NRC, my boss, the EDO, serves as the Chief Operating Officer with responsibility and accountability for the performance of the agency. He is supported in this role by the 3 Deputy EDOs and the Performance Improvement Officer.

Passage of the GPRA Modernization Act provides a golden opportunity for NRC to reassess performance management and to re-evaluate the approach that we are currently using to measure success. A key part of this reassessment is to hear input from our stakeholders on how we are doing. So how do these measures align with your measures for success for NRC's fuel cycle program? How well are we doing? What is important to you? Are we measuring the right outcomes or outputs? What insights can you share that would help us better measure our performance? These are the questions that I would ask you to explore in considering and providing the NRC feedback on what is important to you.

Before I conclude this morning, I want to touch on three additional relevant topics that you may be interested in: safety culture, the fuel cycle oversight process, and moving forward with integrated safety analyses.

On the first topic, we recognize that safety culture contributes directly to the safe and secure use of nuclear materials, so it is a very important topic for discussion and consideration throughout the FCIX. I was pleased to see how many times and in how many ways safety culture was featured in prior FCIXs during the last six years. The Commission has been developing a policy statement on safety culture to communicate expectations to licensees and other users who bear the primary responsibility for the safe and secure use of nuclear material. The policy statement also communicates the Commission's expectations to the NRC staff, government agencies, and other stakeholders who are involved in the safe and secure use of nuclear materials.

You are probably aware that we have been developing this policy statement during the last several years. Because of its significance to safety and security, we actively engaged a large number of diverse stakeholders in seeking input and exchanging information about safety culture throughout this period. The fuel cycle licensee community was ably represented by Bob Link and other representatives. I am pleased to report that the Commission approved the final policy statement in March of this year and we recently received the "go ahead" to publish the final statement in the Federal Register. After it is published, the NRC staff will move forward with more outreach and engagement on the policy statement as we continue to work together to enhance safety culture in the fuel cycle and other programs under our purview.

With respect to the fuel cycle oversight process, the current process is working and accomplishing the agency mission. Despite several attempts to overhaul the oversight process

during the last decade, the current process continues to deliver the expected outcomes as I have previously described. Nevertheless, with experience in both the fuel cycle oversight process and the Reactor Oversight Process, I continue to believe that the existing fuel cycle oversight process could be significantly improved if it adopted some of the elements of the ROP making it more risk-informed, performance-based, transparent, objective, and predictable. During the last year, we have been responding to the Commission's direction, including comparing ISAs and Probabilistic Risk Assessments, exploring how we could give licensees credit for corrective action programs, and considering how we would use ISAs to inform the development of a revised oversight process for the fuel cycle facilities. We look forward to your active engagement with us as the NRC moves forward with considering how we should revise the oversight process.

Finally, if there had been a FCIX about 15 years ago, a key topic would have been the NRC's expectations for and uses of a new-fangled risk assessment called an Integrated Safety Analysis. In the ensuing years, we have collaborated to define, require, plan, conduct, guide, review and implement ISAs that today provide the basis for continued safe operation of the fuel cycle facilities in the United States. This is a proud accomplishment that many have contributed to achieving. In the spirit of collaboration and information sharing, this FCIX provides an opportunity to celebrate this accomplishment and continue to refine, enhance, and improve the ISAs. Licensees have learned over the years how best to conduct the ISAs in accordance with the regulatory requirements of 10 CFR Part 70. Similarly, the NRC staff has learned how to implement the ISAs as part of our regulatory program, in licensing, inspection, enforcement, and incident response. But I know that the NRC can use the ISA results even more to enhance the effectiveness and efficiency of our regulatory programs. By working together, sharing information, and collaborating, we can accomplish these enhancements through fair, consistent, reasonable, timely, transparent, and predictable regulation.

Thanks for your attention. I'd be happy to answer any questions or listen to your comments.

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