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NUCLEAR ENERGY

NRC Has Made Progress in Implementing Its Reactor Oversight and Licensing Processes but Continues to Face Challenges

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Natural Resources and Environment

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Highlights

Highlights of GAO-08-114T, a testimony before the Subcommittee on Clean Air and Nuclear Safety, Committee on Environment and Public Works, U.S. Senate

NUCLEAR ENERGY

NRC Has Made Progress in Implementing Its Reactor Oversight and Licensing Processes but Continues to Face Challenges

Why GAO Did This Study

The Nuclear Regulatory Commission (NRC) is responsible for overseeing the nation's 104 commercial nuclear power reactors to ensure they are operated safely. Since 2000, NRC has used a formal Reactor Oversight Process (ROP) to oversee safety. NRC is also responsible for licensing the construction and operation of new reactors. Electric power companies have announced plans to submit 20 applications in the next 18 months.

This testimony is based on GAO reports that reviewed (1) how NRC implements the ROP, (2) the results of the ROP over several years, (3) the status of NRC's efforts to improve the ROP, (4) NRC's efforts to prepare its workforce and manage its workload for new reactor licensing, and (5) NRC's efforts to develop its regulatory framework and review processes for new reactor activities. In conducting this work, GAO analyzed programwide information and interviewed cognizant NRC managers and industry representatives.

What GAO Recommends

GAO made recommendations to NRC to improve the effectiveness of (1) the ROP in identifying declining safety performance at nuclear power facilities before significant safety problems develop and (2) NRC's workforce and processes in facilitating the review of new reactor license applications. NRC generally agreed with the recommendations.

To view the full product, including the scope and methodology, click on GAO-08-114T. For more information, contact Mark Gaffigan at (202) 512-3841 or gaffiganm@gao.gov.

What GAO Found

In implementing its ROP, NRC uses various tools and takes a risk-informed and graded approach to ensure the safety of nuclear power facilities. The ROP primarily relies on physical inspections of equipment and operations and quantitative measures or indicators of performance at each facility to assess the status of safety and determine appropriate levels of oversight.

Since 2001, NRC has made more than 4,000 inspection findings that reactor unit operators had not fully complied with safety procedures. Almost all of these findings were for actions NRC considered important to correct but of low significance to safe operations. As a result of NRC inspections, more than 75 percent of the nation's reactor units received some level of increased oversight while five units were subjected to NRC's highest level of oversight for long periods because their performance problems were more systemic.

In 2006, GAO reported that NRC has generally taken a proactive approach to improving its ROP. However, concerted efforts will be needed to address shortcomings, particularly in identifying and addressing early indications of declining reactor safety performance. For example, NRC is implementing several enhancements to the ROP to better assess a facility's safety culture—organizational characteristics that ensure safety issues receive the attention their significance warrants. GAO made recommendations to further improve this effort, and NRC has taken initial steps to implement them.

NRC has taken important steps to prepare its workforce for new licensing reviews, but several key activities are still underway and uncertainties remain about its management of the expected surge of applications. For example, NRC has increased funding, hired hundreds of new employees, and created and partly staffed a new office. However, NRC has not completed its development of some computer-based tools for enhancing the consistency and coordination of application reviews and has not fully developed criteria for setting priorities if the workload exceeds available resources. Also, while NRC's Office of New Reactors established a resource management board for coordinating certain office review activities, it has not clearly defined the extent of the board's responsibilities. NRC agreed with recommendations GAO made to further improve its workload management.

NRC has revised most of its primary regulatory framework and review processes, including its rules, guidance, and oversight criteria to provide for early resolution of issues, standardization, and enhanced predictability. However, NRC has not yet completed some associated rules, guidance, and review process components, including revisions to its environmental guidance, its hearing process, and its process for requesting additional information from applicants. Without these components, expected efficiencies and predictability may be limited regarding the total time an applicant needs to obtain a license. NRC agreed with a recommendation GAO made to further improve its application review process.

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss the adequacy of the Nuclear Regulatory Commission's (NRC) Reactor Oversight Process (ROP) to ensure public health and safety. Through the ROP, NRC oversees the operation of the nation's 104 commercial nuclear power reactors, which provide about 20 percent of the nation's electricity. The safety of these reactors, which are located at 65 facilities in 31 states, has always been important because an accident could result in the release of radioactive material with potentially serious adverse effects on public health and the environment. NRC is responsible for inspecting operating nuclear power facilities, while facility operators are responsible for safely operating their facilities. NRC has the authority to take actions, up to and including shutting down a reactor, if conditions are not being met and the reactor poses an undue risk to public health and safety.

NRC is also responsible for licensing the construction and operation of new reactors. Since 1989, NRC has worked to develop a regulatory framework and review process for licensing new reactors that allow an electric power company to obtain a construction permit and an operating license through a single combined license (COL) based on one of a number of standard reactor designs. The COL is NRC's response to the nuclear industry's concerns about the length and complexity of NRC's former two-step process of issuing a construction permit followed by an operating license. NRC has been working to complete this process because electric power companies have announced plans to submit 20 applications in the next 18 months for licenses to build and operate 31 new reactor units—nearly three decades after the last order was placed for a new civilian nuclear power reactor unit in the United States.

As requested, my remarks today will focus on our September 2006 report, which examined how NRC implements the ROP to oversee reactor operations safety, the results of the ROP over the past several years, and the status of NRC's efforts to improve the ROP from 2001 through 2005.[1] In addition, on September 21, 2007, we issued a report to you on the steps NRC has taken to prepare its workforce and manage its workload for new

[1]GAO, *Nuclear Regulatory Commission: Oversight of Nuclear Power Plant Safety Has Improved, but Refinements Are Needed*, GAO-06-1029 (Washington, D.C.: Sept. 27, 2006).

reactor licensing and to develop its regulatory framework and key review processes for new reactor activities.[2]

To examine NRC's oversight of operating reactors through the ROP, we assessed NRC's policies and guidance documents, examined inspection manuals and findings reports, and reviewed the level of oversight it provided as a result of its findings. We analyzed NRC data on nuclear reactor safety for 2001 through 2005, including an assessment of their reliability, which we determined were sufficiently reliable for the purposes of our report. We also analyzed NRC's annual self-assessment reports and relevant inspection documents, reviewed external evaluations of the ROP, and interviewed several NRC managers and external stakeholders. Physical security, which is also covered by the ROP, was not included in this review. In addition, to examine NRC's readiness to evaluate new reactor license applications, we reviewed NRC documents for new reactor workforce staffing and training, examined NRC's regulations and guidance, and interviewed managers in NRC's Office of New Reactors and several other offices with responsibilities related to new reactor efforts. Furthermore, we interviewed nearly all of the announced applicants to obtain their views on the efficiency and usefulness of NRC's application review process and observed several of NRC's public meetings on the new reactor licensing process. Our ROP work was conducted from July 2005 through July 2006, and our new reactor licensing work from January 2007 through September 2007, in accordance with generally accepted government auditing standards.

Background

NRC's Office of Nuclear Reactor Regulation provides overall direction for the oversight process and the Office of Enforcement is responsible for ensuring that appropriate enforcement actions are taken when performance issues are identified. NRC's regional offices are responsible for implementing the ROP, along with the inspectors who work directly at each of the nuclear power facilities. NRC relies on on-site resident inspectors to assess conditions and the licensees' quality assurance programs, such as those required for maintenance and problem identification and resolution. With its current resources, NRC can inspect only a relatively small sample of the numerous activities going on during

[2]GAO, *Nuclear Energy: NRC's Workforce and Processes for New Reactor Licensing Are Generally in Place, but Uncertainties Remain as Industry Begins to Submit Applications*, GAO-07-1129 (Washington, D.C.: Sept. 21, 2007).

complex operations. NRC noted that nuclear power facilities' improved operating experience over more than 25 years allows it to focus its inspections more on safety significant activities.

One key ROP goal is to make safety performance assessments more objective, predictable, and understandable. The unexpected discovery, in March 2002, of extensive corrosion and a pineapple-size hole in the reactor vessel head—a vital barrier preventing a radioactive release—at the Davis-Besse nuclear power facility in Ohio led NRC to re-examine its safety oversight and other regulatory processes to determine how such corrosion could be missed.[3] Based on the lessons learned from that event, NRC made several changes to the ROP. NRC continues to annually assess the ROP by obtaining feedback from the industry and other stakeholders such as public interest groups, and incorporates this feedback and other information into specific performance metrics to assess its effectiveness.

In anticipation of licensing new reactors, NRC has accelerated its efforts to build up its new reactor workforce. NRC's workforce has grown from about 3,100 employees in 2004 to about 3,500 employees as of August 2007, and NRC projects that its total workforce size needs will grow to about 4,000 employees by 2010.

NRC estimates that the first few COL applications will require about 100,000 hours of staff review and identified around 2,500 associated review activities related to each application's detailed safety, environmental, operational, security, and financial information, which may total several thousand pages. NRC anticipates that for each application, the review process will take 42 months—including 30 months for its staff review, followed by approximately 12 months for a public hearing.[4] In addition to the COL, NRC has established (1) the design certification, which standardizes the design of a given reactor for all power companies using it, with modifications limited to site-specific needs, and (2) an early site permit, which allows a potential applicant to resolve many preliminary

[3]GAO, *Nuclear Regulation: NRC Needs to More Aggressively and Comprehensively Resolve Issues Related to the Davis-Besse Nuclear Power Plant's Shutdown*, GAO-04-415 (Washington, D.C.: May 17, 2004).

[4]While the evidentiary hearing occurs after NRC staff complete their review of an application, such prehearing activities as decisions on standing, contention admissibility, and procedural motions begin when the application is docketed.

siting issues before filing a COL application.[5] Electric power companies plan to use five different reactor designs in their COL applications.

NRC Uses Various Tools and Takes a Risk-Informed and Graded Approach to Ensuring the Safety of Nuclear Power Facilities

In implementing its ROP, NRC oversees the safe operation of nuclear power facilities through physical inspections of the various complex plant equipment and operations, reviews of reactor operator records, and quantitative measures or indicators of each reactor's performance. (See table 1 for a more expansive treatment of these tools.) These tools are risk-informed in that they focus on the aspects of operations considered most important to safety. NRC bases its oversight process on the principle and requirement that licensees have programs in place to routinely identify and address performance issues without NRC's direct involvement. Thus, an important aspect of NRC's inspection process is ensuring the effectiveness of licensee programs designed to identify and correct problems. On the basis of the number and risk significance of inspection findings and performance indicators, NRC places each reactor unit into one of five performance categories on its action matrix, which corresponds to graded, or increasing, levels of oversight. NRC assesses overall facility performance and communicates the results to licensees and the public on a semiannual basis.

[5]NRC also plans to issue new regulations providing limited work authorizations that would address the construction activities companies can conduct with NRC authorization and oversight. Such activities as site clearing, excavation, road building, transmission line routing, and erecting construction-related support buildings or service facilities do not require NRC authorization.

Table 1: The ROP's Multiple Tools and Graded Approach

ROP Tool	Description
Baseline inspections	NRC collects information about reactor units' performance from baseline inspections by NRC inspectors and quantitative measures reported by the licensees. These physical inspections are the main tool NRC uses to oversee safety performance of facilities. NRC defined specific inspection areas by developing a list of those elements most critical to meeting the overall agency mission of ensuring safety at nuclear power facilities.
Significance determination process	When NRC inspectors identify a finding they consider to be more than minor,[a] they use a significance determination process to assign one of four colors—green, white, yellow, or red—to reflect the finding's risk significance, which is set on the basis of measures that reflect the potential health effects that could occur from radiological exposure. The significance determination process assesses how an identified inspection finding increases the risk that a nuclear accident could occur, or how the finding affects the ability of the facility's safety systems or personnel to prevent such an accident. For some findings, this process is more deterministic in nature rather than being tied to risk, such as for emergency preparedness or radiation protection. In these areas, NRC defines a response appropriate for the given performance problem.
Supplemental inspections	When NRC issues one or more greater-than-green inspection findings for a reactor unit or facility, it conducts supplemental inspections.[b] There are three levels of supplemental inspections performed by regional inspectors that expand the scope beyond baseline inspection procedures and focus on diagnosing the cause of the performance deficiency: • the lowest level assesses the licensee's corrective actions to ensure they were sufficient in both correcting the problem and identifying and addressing the root and contributing causes to prevent recurrence. • the second level has an increased scope that includes independently assessing the extent of the condition for both the specific and any broader performance problems. • the highest level is yet more comprehensive and includes determining whether the reactor unit or facility can continue to operate and whether additional regulatory actions are needed. This level is usually conducted by a multidisciplinary team of NRC inspectors and may take place over several months.
Cross-cutting aspects or issues	As part of its inspection process, NRC evaluates all of its findings to determine if certain elements of reactor facility performance, referred to as cross-cutting aspects, were a contributing cause to the performance problem. There are three cross-cutting aspect areas: (1) problem identification and resolution, (2) human performance, and (3) a safety-conscious work environment. If more than three findings have similar causes within the same cross-cutting area and if NRC is concerned about the licensee's progress in addressing these issues, it determines that the licensee has a "substantive" cross-cutting issue. NRC notifies the licensee that it has opened a substantive cross-cutting issue, and it may ask the licensee to respond with the corrective actions it plans to take.
Special inspections	NRC conducts special inspections of reactors when specific events occur that are of particular interest to NRC because of their potential safety significance or potential generic safety concerns important to all reactor units or facilities. Special inspections determine the cause of the event and assess the licensee's response to the event. For special inspections, a team of experts is often formed and an inspection charter issued that describes the scope of the inspection efforts.

ROP Tool	Description
Performance indicators	In addition to its various inspections, NRC also collects information through its performance indicator program, which it maintains in cooperation with the nuclear power industry. On a quarterly basis, each facility voluntarily self-reports data for 16 separate performance indicators—quantitative measures of performance related to safety in the different aspects of operations.[c] NRC inspectors review and verify the data submitted for each performance indicator annually through their baseline inspections. Similar to its process for conducting supplemental inspections, when colors indicating the risk level are assigned and when greater-than-green indicators are identified, NRC conducts supplemental inspections in response. A green performance indicator reflects performance within the acceptable range, unlike inspection findings for which green indicates a performance deficiency.
Action matrix	NRC uses its action matrix to categorize reactor unit or facility performance and apply increased oversight in a graded fashion. On a quarterly basis, NRC places each nuclear power reactor unit into one of five performance categories on its action matrix, which corresponds to graded, or increasing, levels of oversight. The action matrix is NRC's formal method of determining how much additional oversight—mostly in the form of supplemental inspections and NRC senior management attention—is required on the basis of the number and risk significance of inspection findings and performance indicators.
Assessment letters and public meetings	At the end of each 6-month period, NRC issues an assessment letter to each nuclear power facility. This letter describes what level of oversight the facility will receive according to its placement in the action matrix performance categories, what actions NRC is expecting the licensee to take as a result of the performance issues identified, the inspection schedule for the next 15 months, and any documented substantive cross-cutting issues. NRC also holds an annual public meeting at or near each facility's site to review performance and address questions about the facility's performance from members of the public and other interested stakeholders.
Industry trends	Annually, NRC assesses the results of its oversight process on an industry-level basis by analyzing the overall results of its inspection and performance indicator programs and comparing them with other industry-collected and reported performance data.

Source: GAO analysis of NRC documents.

Note: NRC conducts an annual self-assessment of the ROP, which includes soliciting input from internal and external stakeholders on its effectives.

[a]NRC defines "minor issues" as those that have little actual safety consequences, little or no potential to impact safety, little impact on the regulatory process, and no willfulness.

[b]Supplemental inspections are also conducted for greater-than-green performance indicators.

[c]There also are three physical security performance indicators that were outside the scope of this review.

The ROP Has Identified Numerous Problems at Nuclear Power Facilities, but Few Have Been Considered Significant to Their Safe Operation

From 2001 through 2005, the ROP identified performance deficiencies through more than 4,000 inspection findings at nuclear power facilities. Ninety-seven percent of these findings were designated green—very low risk to safe facility operations, but important to correct. Two percent (86) were white findings that were considered to be of low to moderate risk significance. Twelve findings were of the highest levels of risk significance—7 yellow and 5 red. More recently, from January 2006 through June 2007, NRC identified an additional 1,174 green findings, 27 white findings, 1 yellow finding, and no red findings.

NRC also reviews performance indicators data—used to monitor different aspects of operational safety—that facility operators report to categorize the level of reactor unit performance for each indicator. From 2001 through June 2007, NRC reported that less than 1 percent of over 39,000 indicator reports exceeded acceptable performance thresholds and nearly half of all reactor units have never had a performance indicator fall outside of the acceptable level. Through June 2007, 3 of the 16 performance indicators have always been reported to be within acceptable performance levels—measuring the amount of time that the residual heat removal safety system is unavailable, monitoring the integrity of a radiation barrier, and monitoring radiological releases. Since 2001, three reactor units have reported a yellow indicator for one performance indicator. No red indicators have ever been reported.

For varying periods from 2001 through 2005, on the combined basis of inspection findings and performance indicators, NRC has subjected more than 75 percent of the reactor units to oversight beyond the baseline inspections. While most reactors received the lowest level of increased oversight through a supplemental inspection, five reactors were subjected to NRC's highest level of oversight. Reactor units in this category were generally subjected to this higher oversight for long periods due to the more systemic nature of their performance problems. Currently, 1 unit is receiving the highest level of oversight by NRC, and 10 units at 6 facilities are receiving the second level of oversight.

NRC inspectors at the facilities we reviewed indicated that when a reactor unit's performance declines it is often the result of deficiencies or ineffectiveness in one or more of the three cross-cutting areas—problem identification and resolution, human performance, and a safety-conscious work environment. NRC inspectors cited examples of possible cross-cutting issues: (1) a facility does not have an effective corrective action program that appropriately identified and resolved problems early; (2) a facility employee has not followed correct maintenance procedures, and

NRC made a finding associated with the human performance area; and (3) facility management is complacent by not paying attention to detail or adhering to procedures. Our examination of ROP data found that all reactor units that NRC subjected to its highest level of oversight had findings related to one or more of these substantive cross-cutting issues. In addition, recent NRC inspections have found more problems associated with these cross-cutting issues, in part because of new guidance for identifying and documenting them.

NRC Continues to Make Improvements to Its ROP in Key Areas

Our 2006 report found that NRC has generally taken a proactive approach to continuously improving its oversight process, in response to recommendations that grew out of the Davis-Besse incident; independent reviews; and feedback that is usually obtained during NRC's annual self-assessment of its oversight process from stakeholders, including its regional and on-site inspectors. Continued efforts will be needed to address other shortcomings or opportunities for improvement, however, particularly in improving its ability to identify and address early indications of declining safety performance at nuclear power facilities. For the most part, NRC considers these efforts to be refinements to its oversight process, rather than significant changes.

Specific areas that NRC is addressing include the following:

- To better focus efforts on the areas most important to safety, NRC has formalized its process for periodically revising its inspection procedures. In particular, NRC completed substantive changes to its inspection and assessment program documents—including those currently guiding the highest level of NRC inspections—to more fully incorporate safety culture.

- To address concerns about the amount of time, level of effort, and knowledge and resources required to determine the risk significance of some inspection findings, NRC has modified its significance determination process, which, according to NRC's 2006 self-assessment, has significantly improved timeliness.

- To address concerns that performance indicators did not facilitate the early identification of poor performance, NRC has modified several indicators to make them more risk-informed for identifying the risks associated with changes in the availability and reliability of important safety systems. In addition, NRC revised an indicator to more accurately reflect the frequency of events that upset reactor unit stability and challenge critical safety functions. NRC is considering options for revising

indicators for emergency preparedness and reactor cooling systems. Both NRC's 2006 self-assessment and internal staff survey cited the need to further improve the performance indicators and their associated guidance.

- Although NRC and others have long recognized the effects of a facility's safety culture on performance, NRC did not undertake efforts to better incorporate safety culture into the ROP until 2005, when it formed a working group to lead the agency's efforts. To date, the group has completed guidance for identifying, addressing, and evaluating cross-cutting issues specific to safety culture.

  Our 2006 report concluded that NRC's efforts to incorporate safety culture into the ROP may be its most critical future change to the ROP and recommended that NRC aggressively monitor; evaluate; and, if needed, implement additional measures to increase the effectiveness of its initial safety culture changes. We also recommended that NRC consider developing specific indicators to measure important aspects of safety culture through its performance indicator program. While NRC has largely implemented initial safety culture enhancements to the ROP that primarily address cross-cutting issues, it does not plan to take any additional actions to further implement either recommendation before it completes its assessment of an 18-month implementation phase at the end of this year. This assessment will include lessons learned that NRC managers have compiled since July 2006, including insights from internal and external stakeholders about the effectiveness of ROP enhancements.

  In addition, we recommended that NRC, in line with its desire to make the ROP an open process, make available additional information on the safety culture at nuclear power facilities to the public and its other stakeholders to provide a more comprehensive picture of performance. NRC has implemented this recommendation by modifying its ROP Web site to fully explain the review process regarding cross-cutting issues and safety culture, and now provides data and correspondence on the reactor units or facilities that have substantive open cross-cutting issues.

NRC Has Implemented Many Actions to Prepare Its Workforce for New Reactor Licensing Reviews and Manage Its Workload, but Several Key Elements Are Still Under Way

NRC has prepared its workforce for new reactor licensing reviews by increasing funding for new reactor activities, reorganizing several offices, creating and partly staffing the Office of New Reactors (NRO), and hiring a significant number of entry-level and midlevel professionals. As of August 2007, NRC had assigned about 350 staff to NRO, about 10 percent of the total NRC workforce; however, some critical positions are vacant, and the office plans to grow to about 500 employees in 2008. To assist its staff in reviewing the safety and environmental portions of the applications, NRC plans to contract out about $60 million in fiscal year 2008 through support agreements with several Department of Energy national laboratories and contracts with commercial companies. NRC also has rolled out several new training courses, but it is still developing content for in-depth training on reactor designs.

NRC is using a project management approach to better schedule, manage, and coordinate COL application and design certification reviews. While NRC has made progress, several elements of NRC's activities to prepare its workforce are still under way, as the following illustrates:

- NRC has developed plans for allocating resources for a design certification application and an early site permit it is currently reviewing, 20 COL applications, 2 additional design certification applications, and a design certification amendment application. However, NRC has not yet developed specific criteria to set priorities for reviewing these applications if it needs to decide which applications take precedence. Without criteria, NRC managers are likely to find it more difficult to decide how to allocate resources across several high-priority areas. Accordingly, we recommended that NRC fully develop and implement criteria for setting priorities to allocate resources across applications by January 2008, which NRC has agreed to do.

- NRC is developing computer-based project management and reviewer tools to assist staff in scheduling and reviewing multiple applications at the same time. For example, Safety Evaluation Report templates are designed to assist COL reviewers by providing standardized content that will enable them to leverage work completed during the design certification review process. However, the implementation of this and other tools has been delayed. We recommended that NRC provide the resources for implementing reviewer and management tools needed to ensure that the most important tools will be available as soon as is practicable, but no later than March 2008, which NRC has agreed to do.

- NRO established a cross-divisional resource management board early in 2007 for resolving resource allocation issues if major review milestones

are at risk of not being met. However, it has not clearly defined the board's role, if any, in setting priorities or directing resource allocation. Because NRO expects to review at least 20 COL applications and 6 design certification, early site permit, and limited work authorization applications associated with its new reactor program over the next 18 months, it may not be able to efficiently manage thousands of activities simultaneously that are associated with these reviews. NRC managers we spoke with recognize this problem and plan to address it. We recommended that NRC clarify the responsibilities of NRO's Resource Management Board in facilitating the coordination and communication of resource allocation decisions, which NRC has agreed to do.

NRC Has Significantly Revised Its Overall Regulatory Framework and Review Process, but Several Activities Are Still in Progress

NRC has significantly revised most of its primary regulatory framework and review process to prepare for licensing new reactors. Specifically, NRC has revised and augmented its rules, guidance, and oversight criteria for licensing and constructing new reactors primarily to provide for early resolution of issues, standardization, and predictability in the licensing process. In making these changes, NRC has regularly interacted with nuclear industry stakeholders to determine which parts of an application's technical and operational content could be standardized and to clarify guidance on certain technical matters. In addition, NRC just completed modifications to its acceptance review process to include an evaluation of the application's technical sufficiency as well as its completeness and made internal acceptance review guidance available last week. While NRC has made progress in these areas, it has not yet completed some ancillary rules and regulatory guidance, or actions to implement certain review process components. For example, because NRC only recently solicited public comments to further update its environmental guidance, applicants may have more difficulty developing specific COL content for unresolved issues. In addition, while NRC proposed a rule to update physical protection requirements in September 2006, officials told us that it will not be made final until 2008. Furthermore, NRC's limited work authorization rule, while substantially complete, will not be available in final form before October 2007. Lastly, NRC is revising its policy for conducting hearings on both the contested and uncontested portions of applications.

In addition, NRC is refining its processes to track its requests for additional information to each applicant. In some instances, applicants using the same reference reactor design may be asked the same question, and one applicant may have already provided a satisfactory answer. With a completed tracking process, the second reviewer could access the previously submitted information to avoid duplication. We recommended

that NRC enhance the process for requesting additional information by (1) providing more specific guidance to staff on the development and resolution of requests for additional information within and across design centers and (2) explaining forthcoming workflow and electronic process revisions to COL applicants in a timely manner. NRC has agreed to do so.

In conclusion, the safe operation of the nation's nuclear power facilities has always been of fundamental importance and has received even more emphasis recently as the nation faces an expected resurgence in the licensing and construction of new nuclear reactors to help meet our growing electricity needs. Our assessment of the ROP has found that NRC has made considerable effort to continuously improve its oversight activities and to prompt industry to make constant management improvements. However, while the current oversight process appears logical and well-structured, NRC recognizes the need to make further improvements in such areas as the timeliness of its significant determination process and the redefinition of some performance indicators. Regulating the often complex and intangible aspects of safety culture is clearly challenging. While NRC had taken some concrete actions to incorporate safety culture into the ROP and now has a structured process in place through its inspection program, we recommended that NRC continue to act to improve its safety culture efforts. NRC plans to evaluate the effectiveness of its current actions at the end of this year before considering any further implementation of our recommendations. We continue to believe that NRC needs to give this issue attention in further revising the ROP so that it can better identify and address early indications of declining safety performance at nuclear power facilities.

NRC has made important strides in revising its regulatory framework and review process for licensing new nuclear reactors to improve timeliness and provide more predictability and consistency during reviews. Nevertheless, NRC's workforce will face a daunting task in completing certain regulatory actions currently under way and implementing this new process as it faces a surge in applications over the next 18 months—the first of which has just been submitted. We identified four actions that NRC could take to better ensure its workforce is prepared to review new reactor applications and that its review processes more efficiently and effectively facilitate reviews, and NRC agreed to implement them.

Mr. Chairman, this completes my prepared statement. I would be happy to respond to any questions you or the other Members of the Subcommittee may have at this time.

Contact and Acknowledgments

For further information about this testimony, please contact Mark Gaffigan, at (202) 512-3841 or by e-mail at gaffiganm@gao.gov. Richard Cheston, Assistant Director; Sarah J. Lynch; Alyssa M. Hundrup; and David Stikkers made key contributions to this testimony.

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