

April 27, 2005

The Honorable George V. Voinovich, Chairman
Subcommittee on Clean Air, Climate Change,
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am pleased to provide a summary of actions taken by the NRC in response to recommendations contained in various United States Government Accountability Office (GAO) reports that address NRC activities. The enclosed summary, which is required by Section 236 of Public Law 91-510, the "Legislative Reorganization Act of 1970," describes the progress made in addressing recommendations remaining open as of, or not included in, our last summary report of April 6, 2004.

Sincerely,

/RA/

Nils J. Diaz

Enclosure:
Summary of NRC Actions

cc: Senator Thomas Carper

Identical letter sent to:

The Honorable George V. Voinovich, Chairman
Subcommittee on Clean Air, Climate Change,
and Nuclear Safety
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator Thomas Carper

The Honorable James M. Inhofe, Chairman
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510
cc: Senator James M. Jeffords

The Honorable Ralph M. Hall, Chairman
Subcommittee on Energy and Air Quality
Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative Rick Boucher

The Honorable Joe Barton, Chairman
Committee on Energy and Commerce
United States House of Representatives
Washington, D.C. 20515
cc: Representative John D. Dingell

The Honorable David L. Hobson, Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States House of Representatives
Washington, D.C. 20515
cc: Representative Peter J. Visclosky

The Honorable Pete V. Domenici, Chairman
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate
Washington, D.C. 20510
cc: Senator Harry Reid

The Honorable Judy Biggert, Chair
Subcommittee on Energy
Committee on Science
United States House of Representatives
Washington, D.C. 20515
cc: Representative Nick Lampson

The Honorable Henry Hyde, Chairman
Committee on International Relations
United States House of Representatives
Washington, D.C. 20515
cc: Representative Tom Lantos

The Honorable Richard G. Lugar, Chairman
Committee on Foreign Relations
United States Senate
Washington, D.C. 20510
cc: Senator Joseph R. Biden, Jr.

The Honorable Susan Collins, Chair
Committee on Homeland Security and
Governmental Affairs
United States Senate
Washington, D.C. 20510
cc: Senator Joseph I. Lieberman

The Honorable Tom Davis, Chairman
Committee on Government Reform
United States House of Representatives
Washington, D.C. 20515
cc: Representative Henry Waxman

The Honorable David M. Walker
Comptroller General of the United States
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

The Honorable Joshua B. Bolten
Director, Office of Management and Budget
725 17th Street, NW
Washington, D.C. 20503

SUMMARY OF NRC ACTIONS

RESPONSE TO GAO REPORTS

- | | | |
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GAO Report - Nuclear Regulation
Action Needed to Control Radioactive Contamination
at Sewage Treatment Plants
May 1994
(GAO/RCED-94-133)

The U.S. Government Accountability Office (GAO), in its report "Nuclear Regulation - Actions Needed to Control Radioactive Contamination at Sewage Treatment Plants," made specific recommendations for responding to contamination of sewage sludge by discharges from NRC and Agreement State licensees. One recommendation remained open at the end of calendar year 2003. The recommendation, the NRC's response, and report of progress during 2004 are provided below.

Recommendation 3

Establish acceptable limits for radioactivity in sludge, ash, and related byproducts to ensure the health and safety of treatment workers and the public.

NRC Response and Status:

NRC has continued to work with the Environmental Protection Agency (EPA) and with the operators of publicly owned treatment works (POTWs) through the Interagency Steering Committee on Radiation Standards (ISCORS) Sewage Sludge Subcommittee to ensure adequate protection of the public health and safety. The current EPA standards for sewage sludge (40 CFR 503) do not include radionuclides.

Using the results of the sewage sludge survey contained in "ISCORS Assessment of Radioactivity in Sewage Sludge: Radiological Survey Results and Analysis," the Sewage Sludge Subcommittee undertook a radiation dose assessment to help assess the potential threat that these radioactive materials may pose to human health. A draft report, "ISCORS Assessment of Radioactivity in Sewage Sludge: Modeling to Assess Radiation Doses," was made available to the public for comment in the *Federal Register* on November 26, 2003 (68 FR 66508, or see the ISCORS web site, www.iscors.org). This report describes the methodology and results of the dose modeling effort. The general approach used in the report consists of two steps. First, seven general scenarios were constructed to represent typical situations in which members of the public and POTW workers are likely to be exposed to sludge. The selection of radionuclides for consideration was based on the results of the ISCORS survey of sewage sludge and ash at various POTWs and includes man-made and naturally occurring isotopes. Second, a widely accepted, multi-pathway, environmental transport model (the RESRAD [residual radioactivity] family of computer codes) was employed to obtain sludge concentration-to-dose conversion factors. One conclusion from the survey and dose assessment is that the most significant cases of radioactivity (in terms of dose) in sewage sludge are likely to be for naturally occurring radioactive material (NORM), not the Atomic Energy Act (AEA) materials regulated by NRC.

A third report, "ISCORS Assessment of Radioactivity in Sewage Sludge: Recommendations on Management of Radioactive Materials in Sewage Sludge and Ash at Publicly Owned Treatment Works," provides guidance to POTW operators based on the survey results and radiation dose assessment. This report was also issued for public comment in the above referenced *Federal Register* notice and is available on the ISCORS web site. This guidance document is for use by

POTW operators to evaluate whether the presence of radioactive materials in sewage sludge or ash could pose a threat to the health and safety of POTW workers or the general public. Based upon the information produced by the ISCORS survey and dose modeling efforts, this guidance document has three major purposes: (1) to alert POTW operators and State and Federal regulators to the possibility of radioactive materials concentrating in sewage sludge and incinerator ash; (2) to inform POTW operators how to determine if, indeed, there are elevated levels of radioactivity in their sludge and ash; and (3) to assist POTW operators in identifying actions for reducing potential radiation exposure from sludge and ash. The report also recommends a dose level above which POTWs should consult with State radiation protection program staff. The report provides screening concentrations that can be used for simple screening of measured concentrations in sludge and ash. Finally, ISCORS has concluded in this report that the levels of radioactive materials detected in sewage sludge and ash in the ISCORS survey indicate that at most POTWs, radiation exposure to workers or to the general public is not likely to be a concern.

The Subcommittee received comments on the two draft reports (on dose modeling and on recommendations) and has revised the reports. The reports are essentially complete and are being finalized for publication. The final reports will be placed on the ISCORS web page.

The ISCORS Subcommittee did not recommend establishing regulatory limits for radioactivity in sludge. NRC agrees with the ISCORS conclusion that there is no nationwide problem with radioactivity in sludge. The NRC staff concluded that the ISCORS recommendations report provides a sufficient response to the level of the problem associated with this GAO recommendation.

The NRC considers this GAO recommendation closed.

GAO Report - Nuclear Regulation
Strategy Needed to Regulate
Safety Using Information on Risk
March 1999
(GAO/RCED-99-95)

The U.S. Government Accountability Office (GAO), in its report “Nuclear Regulation - Strategy Needed to Regulate Safety Using Information on Risk,” made a recommendation to help ensure the safe operation of plants and the continued protection of public health and safety in a competitive environment. The recommendation, NRC’s response, and report of progress during 2004 are provided below.

Recommendation

To help ensure the safe operation of plants and the continued protection of public health and safety in a competitive environment, we recommend that the Commissioners of NRC direct the staff to develop a comprehensive strategy that: includes but is not limited to objectives, goals, activities, and time frames for the transition to risk-informed regulation; specifies how the Commission expects to define the scope and implementation of risk-informed regulation; and identifies the manner in which it expects to continue the free exchange of operational information necessary to improve the quality and reliability of risk assessments.

NRC Response and Status:

NRC agrees that there is a need for a comprehensive strategy. In response to Commission direction, the staff developed an approach for risk-informing the agency’s regulatory activities, and progress has been made in this area.

The NRC developed a strategy and a plan (SECY-00-0213, “Risk-Informed Regulation Implementation Plan,” dated October 26, 2000). The purpose of the plan is to integrate the Commission’s risk-informing activities by identifying requirements and practices that need to be risk-informed and the data, methods, guidance, and training needed to meet these goals. This plan also explains the agency’s risk-informed regulation policy to the public and the nuclear industry. After the first complete version of the plan was issued in October 2000, an update was issued in December 2001 and two updates each in calendar years 2002, 2003, and 2004, each of which described agency actions designed to risk-inform its regulatory activities. The Risk-Informed Regulation Implementation Plan (RIRIP) is updated twice a year and, thus, will continue to incorporate information gathered from the application of risk-informed regulation and plans for additional implementation activities.

The most recent update of the RIRIP (SECY-04-0197, “Update of the Risk-Informed Regulation Implementation Plan,” dated October 25, 2004) includes additional activities in the reactor safety area and in the materials safety and waste safety areas. Among the accomplishments listed in the most recent RIRIP are the following:

- approval of a final rule (10 CFR 50.69) to provide an alternative approach for establishing requirements for treatment of structures, systems, and components (SCCs) for nuclear power reactors using a risk-informed method of categorizing SSCs according to their safety significance. (The final rule was published on November 22, 2004, and

became effective on December 22, 2004. Implementation of the rule by licensees is voluntary.)

- development of an alternative performance-based, risk-informed fire protection standard for nuclear power plants in conjunction with the National Fire Protection Association standard, NFPA 805, “Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants.” The final rule (10 CFR 50.48(c)) was published on June 16, 2004, and became effective on July 16, 2004.)
- completion of NUREG/CR-6595, “An Approach for Estimating Frequencies of Various Containment Failure Modes and Bypass Events,” as an update to address conditions related to low-power reactor operations and shutdown (LPSD), supporting the American Nuclear Society’s development of PRA standards.
- development of a new performance indicator, called the Mitigating Systems Performance Index (MSPI), to support the reactor oversight process (ROP) that will be pilot tested at 20 plants.
- development of an action plan (provided in SECY-04-0118, “Plan for the Implementation of the Commission’s Phased Approach to Probabilistic Risk Assessment Quality,” dated July 13, 2004) for implementing a phased approach to achieving appropriate probabilistic risk assessment (PRA) quality and completeness, a next step in the process of standardizing PRA methods.
- initiation of the development of standard procedures and methods for risk assessment of inspection findings and reactor incidents using the Risk Assessment Standardization Project (RASP). This effort ensures that the current risk assessments for the Significance Determination Process (SDP), Accident Sequence Precursor, and NRC Management Directive 8.3 (“NRC Incident Investigation Program”) analyses of events are performed in a consistent manner.
- completion of a draft staff report, NUREG-1792, “Good Practices for Implementing Human Reliability Analysis.” The human reliability analysis (HRA) good practices were developed to support implementation of NRC Regulatory Guide (RG) 1.200, “An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities.”

Among the activities planned for the next six months are:

- development of implementation guidance for NFPA 805—in conjunction with the industry—and endorsement by NRC in a regulatory guide.
- publication of a proposed rule for public comment on risk-informing the requirements for nuclear reactor Emergency Core Cooling Systems (10 CFR 50.46).
- publication of the final staff report documenting development of the MSPI, including results from the pilot program.
- transition from “developmental” work to trial application of the proposed, systematic risk-informing of decision making relative to routine materials and waste activities. This

supports the implementation of a framework for risk-informing the NRC's Office of Nuclear Materials Safety and Safeguards (NMSS) regulatory process.

- continued use of risk information and insights by the high-level waste (HLW) program staff to risk-inform pre-licensing activities in preparation for the review of a license application that the U.S. Department of Energy (DOE) plans to submit for a repository at Yucca Mountain.
- completion of a draft report on the development of a Human Event Repository and Analysis (HERA) database, which will address the weaknesses of the available data for HRA. In addition, this HERA database will support NRC activities involving human factors research that are constrained by the lack of a database, which analysts could use when addressing regulatory issues.

During the last few years, the NRC has made noticeable progress toward risk-informing its regulatory activities and much progress has been made in this area as the use of risk-informed analysis and decision making are being incorporated into the agency's regulatory activities. Based on the development of the strategy incorporated in the RIRIP; continuing progress in the reactor safety, material safety, and waste safety areas; and upcoming improvements in PRA quality, risk analysis, and risk assessment, the NRC believes it is meeting the intent of GAO's recommendations.

The NRC considers this GAO recommendation open.

GAO Report - Nuclear Regulatory Commission
Oversight of Security at
Commercial Nuclear Power Plants
Needs to be Strengthened
September 2003
(GAO-03-752)

The U.S. Government Accountability Office (GAO), in its report “Nuclear Regulatory Commission - Oversight of Security at Commercial Nuclear Power Plants Needs to be Strengthened,” made specific recommendations to strengthen NRC’s security inspection program. The recommendations that remained open at the end of calendar year 2003, the NRC’s responses, and report of progress during 2004 are provided below.

Recommendation 3.2

Make force-on-force exercises required activities and strengthen them by using laser equipment to ensure accurate accounts of shots fired.

NRC Response and Status:

On January 23, 2003, the Commission directed the staff to conduct force-on-force exercises, initially in a pilot program at a rate of approximately two exercises per month. The Commission also approved the use of Multiple Integrated Laser Engagement System (MILES) equipment during exercises to provide realism. The Commission’s direction stressed that the pilot program constituted resumption of force-on-force testing.

Following completion of the pilot program, on August 13, 2004, the Commission approved use of MILES or other exercise simulation equipment (ESS) found acceptable by the NRC during the triennial NRC-evaluated exercises. The staff subsequently incorporated the use of MILES or other acceptable ESS equipment in its Inspection Procedure (IP) 71130.03, “Contingency Response - Force-on-Force Testing,” dated November 10, 2004. In November 2004, the staff began conducting evaluated force-on-force exercises as a triennial requirement using MILES equipment in accordance with IP 71130.03.

The NRC considers this GAO recommendation closed.

Recommendation 3.3

Make force-on-force exercises required activities and strengthen them by requiring the exercises to make use of the full terrorist capabilities stated in the design basis threat, including the use of an adversary force that has been trained in terrorist tactics.

NRC Response and Status:

On January 23, 2003, the Commission directed the staff to conduct force-on-force exercises, initially in a pilot program, using expanded adversary characteristics until the issuance of a revised design basis threat (DBT). The Commission’s direction stressed that the pilot program constituted resumption of force-on-force testing.

On April 29, 2003, NRC issued Orders to all operating commercial nuclear power plants which revised the DBT. On May 8, 2004, the staff issued guidance on implementation of this revised DBT. The staff conducted a transitional force-on-force exercise program while facility licensees adapted their security programs to the supplemented requirements of the revised DBT.

On December 23, 2003, the Commission approved the establishment of a composite adversary force (CAF) meeting standards and guidelines developed by the NRC staff. In May 2004, the staff issued "Composite Adversary Force Performance Standards for Force-on-Force Exercises," NSIR/STD-2004/15-001, which includes the minimum standards for the knowledge, skills, abilities, and performance necessary to conduct realistic and challenging force-on-force exercises. The industry subsequently established and maintains a CAF that meets the standards defined in NSIR/STD-2004/15-001.

Following completion of the pilot and transitional programs, the staff incorporated the revised DBT and its implementing guidance, and use of the CAF, in Inspection Procedure (IP) 71130.03, "Contingency Response - Force-on-Force Testing," dated November 10, 2004. In November 2004, the staff began conducting evaluated force-on-force exercises, as a triennial requirement, fully using the revised DBT and the CAF in accordance with IP 71130.03.

The Commission will continue to assess the performance of the adversary force and will require improvements to the CAF program, if appropriate, up to and including developing an NRC contracted adversary force.

The NRC considers this GAO recommendation closed.

GAO Report - Nuclear Security
Federal and State Action
Needed to Improve Security of
Sealed Radioactive Sources
August 2003
(GAO-03-804)

The U.S. Government Accountability Office (GAO), in its report "Nuclear Security - Federal and State Action Needed to Improve Security of Sealed Radioactive Sources," made specific recommendations to strengthen NRC's security inspection program. The recommendations that remained open at the end of calendar year 2003, the NRC's responses, and report of progress during 2004 are provided below.

Recommendation 2

Determine, in consultation with the Agreement States, the costs and benefits of requiring owners of devices that are now generally licensed to apply for specific licenses and whether the costs are commensurate with the risks these devices present.

NRC Response and Status:

Using a risk-informed, graded approach, the NRC and Agreement States have regulated sources and devices in accordance with the Atomic Energy Act of 1954, as amended, by: (1) issuing specific licenses, (2) providing provisions in its regulations for general licenses, and (3) providing provisions in its regulations for exemption from licensing (e.g., smoke detectors). Recently, the NRC and Agreement States have identified and cataloged the sources of greatest concern; i.e., high-risk sources defined by the International Atomic Energy Agency's (IAEA's) Code of Conduct as Category I and Category II. While generally licensed devices may include radionuclides defined in the Code of Conduct, the quantities are typically orders of magnitude less than the Category I and Category II threshold quantities. It should also be noted that the Code of Conduct includes Radium-226, but this radionuclide is not licensed or regulated by the NRC.

In a December 2000 rulemaking regarding registration of generally licensed devices (10 CFR Parts 30, 31, and 32), the NRC decided not to convert certain general licensees to a new category of specific licensees. Instead, the revisions that were made in the rule were designed to improve control and accountability of generally licensed devices, especially for certain devices that are required to be registered. The devices are designed to be inherently safe to use so that a license application process to evaluate the prospective licensee would not be necessary. Making all general licensees become specifically licensed would be a major change in the requirements for this group of licensees and would require the significant expenditure of resources by both the NRC and the licensees. The safety and security risks posed by most generally licensed devices would not warrant such an expenditure of resources.

However, NRC is planning to initiate a 10 CFR Part 30 rulemaking beginning in FY 2006. This rulemaking will examine the delineation between general licensing and specific licensing for byproduct materials. As part of the rulemaking, NRC will determine the appropriateness of the criteria under which the NRC approves devices to be distributed under a general license, including better assurance that larger source quantities will not be approved for generally

licensed devices. The rulemaking process would include consultation with stakeholders, including Agreement States.

After 9/11 and the issuance of the Code of Conduct, the NRC performed a review of its Sealed Source and Device Registry (SSD), and determined that all IAEA Category I sources are already specifically licensed by the NRC and Agreement States. Additionally, with the exception of one type of generally licensed device, all Category II source devices are also specifically licensed. The NRC has issued a specific license to the distributor of this device, which is a normal requirement for all generally licensed devices. Additionally, NRC regulations under 10 CFR 31.5 require that any person who acquires, receives, possesses, uses, or transfers a generally licensed device: maintain the device's labels; perform leak tests; ensure that label instructions are followed; maintain the records of compliance with these requirements; notify the manufacturer and the NRC or Agreement State of any device failure, damage, loss, or theft; not abandon or export the device; and transfer the device only in accordance with specific restriction. As noted above, generally licensed devices are designed to be inherently safe under normal operating conditions and under likely accident scenarios. The NRC staff has recognized that the security of these sources has not been included in security Orders issued to NRC and Agreement State licensees and is in the process of contacting Agreement States to identify such devices as part of its on going efforts to maintain an inventory of sources of greatest concern.

This GAO recommendation remains open.

Recommendation 3

Modify NRC's process of issuing specific licenses to ensure that sealed sources cannot be purchased before NRC's verification—through inspection or other means—that the materials will be used as intended.

NRC Response and Status:

NRC agrees with the objective of this recommendation. An NRC-Agreement State working group is developing a process to ensure that high-risk radioactive sources cannot be obtained before verification—through inspection or other means—that the materials will be used as intended. The working group is expected to deliver a recommended approach to NRC senior management during 2005.

This GAO recommendation remains open.

Recommendation 5

Include criteria and performance measures of the NRC's and the Agreement States' implementation of additional security measures in NRC's periodic evaluations of its and Agreement States' effectiveness.

NRC Response and Status:

The NRC staff, in coordination with the Materials Security Steering Committee, is developing alternative approaches for providing oversight of materials security activities, including a new Integrated Materials Performance Evaluation Program (IMPEP) non-common performance indicator. Work to develop a process is planned to be completed by mid-FY 2005.

This GAO recommendation remains open.

GAO Report - Information Technology Management -
Governmentwide Strategic Planning, Performance Measurement,
and Investment Management Can Be Further Improved
February 2004
(GAO-04-49)

The U.S. Government Accountability Office (GAO), in its report, "Information Technology Management - Governmentwide Strategic Planning, Performance Measurement, and Investment Management Can Be Further Improved," made several recommendations with respect to improving the NRC's Information Technology (IT) strategic planning and performance measurement processes. The NRC's responses and report of progress during 2004 are provided below for the GAO recommendations which remained open at the end of calendar year 2004.

Recommendation 1

To improve the agency's IT strategic planning/performance measurement processes, we recommend that the Commissioners of the Nuclear Regulatory Commission:

- a. document the agency's roles and responsibilities for its IT strategic management processes and how IT planning is integrated with its budget and human resources planning;

NRC Response and Status:

The NRC has developed a process for establishing an NRC Strategic Plan, which is on a 3-year cycle. The Commissioners are actively engaged in the development of the Strategic Plan, including the development of strategic goals and objectives. In response to the strategic plan goals and performance objectives, offices develop their individual plans for IT investments that support their goals and performance objectives.

The Chief Information Officer (CIO) has the responsibility to develop IT strategic management processes in conjunction with the NRC program offices and to document those processes. The NRC's Office of Information Services (OIS) has published management directives which establish the IT investment planning and decision making policies and processes, including roles and responsibilities at the agency. NRC Management Directive 2.2, "Capital Planning and Investment Control," describes the process, roles, and responsibilities for justification and approval of IT investments. Approved IT investments are managed using the OIS's System Development Life Cycle Management Methodology (SDLCMM), which is described in draft Management Directive 2.5. Roles and responsibilities are described in these management directives. These directives will be integrated into a single management directive in FY 2005, thereby providing a single reference that identifies all IT strategic management processes.

The NRC has also established special governance committees, councils, and groups with specific roles and responsibilities in the capital planning and investment control (CPIC) and SDLCMM processes—the NRC IT Governance Framework. The Agency IT Governance Framework is a four-tiered approach to planning and managing agency IT investments. The framework documents the roles, responsibilities, and authorities of its IT investment management boards. The first tier, the IT Focus Group, draws its membership from program office staff and is chaired by an OIS manager. This group is responsible for

identifying business areas where technology can be used to solve business problems and more effectively and efficiently accomplish business objectives. The second tier, the agencywide IT Business Council (ITBC), consisting of division-level managers, is focused on the business needs of the agency. It is chaired by a group member. The ITBC provides input on the alignment of new IT investments with current applications, practices, and business needs. The third tier, the IT Senior Advisory Council, consisting of office-director-level membership and chaired by the Director, OIS, provides strategic direction on major IT initiatives, and prioritizes the agency IT investments to manage the agency IT investment portfolio more effectively. The top tier, the Program Review Committee (PRC), reviews office budget submissions for consistency with agency performance goals, measures, policy guidance, and planning assumptions. The CIO is a voting member of the PRC and briefs the PRC on the agencywide IT budget.

The CPIC process is used to establish a portfolio of approved major IT investments. The CPIC process requires identification of the NRC strategic goal(s) addressed by each major investment and the human resource requirements. The CIO reviews each investment submitted through CPIC to ensure that it is aligned with the NRC Strategic Plan goals and objectives and consistent with the agency's draft Information Resources Management (IRM) Plan and Enterprise Architecture Blueprint. The OIS maintains the enterprise view of the IT investments. The PRC approves the agencywide IT budget as part of the overall budget approval process. The IT budget is reviewed by the Chairman and Commissioners as a part of the overall budget approval process.

Human resource planning is integrated with IT planning through the agency's Human Resources (HR) organization's Strategic Workforce Planning program using the Office of Personnel Management's five steps of workforce planning: (1) set strategic direction; (2) analyze the workforce and identify skill gaps; (3) develop an action plan; (4) implement the action plan; and (5) monitor, evaluate, and revise the action plan. In addition, the OIS has recruited a Senior Program Analyst (Educational Outreach) who will serve as a Human Capital expert for IT human resource needs. The role of the Human Capital expert will be to assist the OIS in continuing to analyze and address skill gaps between the agency's human resources and its planned IT investments.

This GAO recommendation remains open.

- c. develop a documented process to assign roles and responsibilities for achieving its enterprisewide IT goals;

NRC Response and Status:

The NRC's IT Governance Framework describes the roles and responsibilities for approval of IT programs and projects. The roles and responsibilities are documented in Management Directive 2.2, "Capital Planning and Investment Control," a revision of which was issued in January 2004 and draft Management Directive 2.5, "System Development Life Cycle Management Methodology." These directives will be integrated into a single management directive in FY 2005, thereby providing a single reference that identifies all the roles and responsibilities for approval of IT programs and projects.

The agency is continuing to develop an Enterprise Architecture Blueprint and an IRM Strategic Plan that describe our enterprisewide IT goals. It is the role of OIS to ensure that IT programs that are approved are consistent with these goals. The review process for IT

programs required by Management Directive 2.2 includes an Enterprise Architecture review by OIS to determine whether programs are aligned with the goals in the IRM Strategic Plan and the Enterprise Architecture Blueprint prior to CIO approval.

This GAO recommendation remains open.

- d. develop performance measures related to the effectiveness of controls to prevent software piracy;

NRC Response and Status:

As part of seat management implementation, NRC developed a baseline of licensed software installed on agency computers. This baseline is updated as system configurations change. In January 2003, the NRC began monthly software monitoring to ensure ongoing compliance with licensing requirements. On a monthly basis, the software found on randomly selected computers is compared to the database of software licensed for each computer, and any unlicensed software is removed. Performance measures related to the effectiveness of controls to prevent software piracy will be included in the NRC IRM Strategic Plan, which is scheduled to be issued by the end of FY 2005.

In addition, the agency computer security awareness training and educational program includes special training to all new employees, and an annual on-line awareness course for all employees and contractors covers piracy, bootlegging, and copyright protection of software. This information is further stressed in our continuous agencywide poster campaign and in annual activities for computer security awareness day.

This GAO recommendation remains open.

- e. develop performance measures for the agency's enterprise goals in its IRM plan, and track actual-versus-expected performance for these measures.

NRC Response and Status:

In 2005, the enterprisewide IRM Strategic Plan for the NRC will be developed, approved, and aligned with the agency's enterprise goals. The IRM Strategic Plan will identify the IT strategies that will be implemented to contribute to achieving the performance measures and the targets for the agency's enterprise goals. Cost, schedule, and performance goals will be included for major systems requiring an OMB Exhibit 300. The Information Services group of NRC's OIS includes in its operating plan the requirement to monitor the progress of those systems and report remediation to the CIO on major IT investments that deviate from cost, schedule, or performance goals.

This GAO recommendation remains open.

Recommendation 2

To improve the agency's IT investment management processes, we recommend that the Commissioners of the Nuclear Regulatory Commission:

- a. include a description of the relationship between the IT investment management process and the department's other organizational plans and processes and its enterprise

architecture, and identify external and environmental factors that influence the process in the agency's IT capital planning and investment control policy;

NRC Response and Status:

The IT investment management process uses information derived from NRC's Planning, Budgeting, and Performance Management Process and the agency's strategic planning process. Performance measures that support the information technology and investment management goals in the NRC Strategic Plan have been developed and are used internally for both focused program evaluations and ongoing organizational monitoring. Specific metrics address the factors most appropriate to each program and investment. The IT investment management process employs broad overall "value" performance measures. Investment value measures relate to strategic alignment, financial management goals, productivity and efficiency, quality, enterprise architecture and security, timeliness, and customer or programmatic benefit. Investment project managers perform a risk analysis for each potential major IT investment. Specific risk concerns that cut across all IT investments, such as level of definitional risk, external or environmental risk, and use of iterative project development procedures, are beginning to be addressed through a standardized methodology. NRC has acquired and installed ProSight as the tool to support its portfolio management program that will be utilized for all IT investments. It is expected to be operational in FY 2005. NRC is also supplementing existing practices by using the Federal Enterprise Architecture (FEA) Performance Reference Model metrics to help measure the performance of major IT initiatives and assess their contribution to NRC program performance. NRC conducts annual performance reviews and performance evaluations and assessments and summarizes results in the annual Budget/Performance Plan.

NRC Management Directive 2.2, "Capital Planning and Investment Control," requires that all IT investments comply with the NRC enterprise architecture. Compliance with the NRC enterprise architecture is also mandated in Management Directive 2.1, "Information Technology Architecture." NRC is taking the steps necessary to improve its current management directives and fully integrate its IT investment management processes. NRC capital planning and investment control, enterprise architecture, the infrastructure development process, the systems development life cycle management methodology, and security processes are central IT investment processes. These processes are now being integrated into a single, documented IT investment management process that will provide standard operating procedures with significant events and decision points outlined throughout an IT initiative's life cycle. This new methodology will be called the Project Management Methodology (PMM). Current plans are to make the PMM available to all NRC staff as a new management directive with an accompanying handbook during FY 2005.*

External and environmental factors such as new legislation may impact the IT investment management process by requiring the addition of new controls or compliance checks. The integrated PMM allows for the rapid change to the investment management process by

* This new management directive will also incorporate draft Management Directive 2.5, "System Development Life Cycle Management Methodology."

documenting those processes as standard operating procedures (SOPs) and providing the PMM Configuration Control Board (CCB) the authority to change the SOPs.

This GAO recommendation remains open.

- b. develop work processes and procedures for the agency's investment management boards;

NRC Response and Status:

The NRC is in the process of developing work processes and procedures for investment management boards and will continue to refine roles and responsibilities for IT strategic management processes as more experience is gained. Specific details of these procedures will be defined in conjunction with the board members as NRC develops its proposed PMM, which will integrate capital planning and investment control, enterprise architecture, security, the infrastructure development process, and the systems development life cycle management methodology in a single management directive. The PMM will be completed during FY 2005 and will serve as a new, integrated policy, with an accompanying handbook and supplemented by web-based SOPs, which will document our processes for aligning and coordinating NRC IT investment decision making.

To date, the NRC has developed the Agency Information Technology Governance Framework, which provides a high-level outline of our board processes. The Agency IT Governance Framework is a four-tiered approach to planning and managing agency IT investments. The framework is described in our response to Recommendation 1a.

This GAO recommendation remains open.

- c. implement a standard, documented procedure to maintain its IT asset inventory, and develop a mechanism to use the inventory as part of managerial decision making;

NRC Response and Status:

The NRC is currently developing a standard, documented procedure to ensure the update and maintenance of its IT asset inventory. The procedure to be followed will be documented in the PMM standard operating procedures, which will delineate specific processes to be followed to ensure that timely and repeatable updates occur. The NRC currently has a baseline IT applications inventory that has been migrated to the System Architect tool set. The agency has made selected asset inventory reports available on the Intranet and currently maintains an on-line inventory database of IT infrastructure hardware and commercial off-the-shelf software. This database will feed into the System Architect tool that maintains the applications layer of our enterprise architecture. The information in our IT asset inventory is now used in IT investment decision making. However, the NRC expects to leverage this information within its portfolio management program, which will become operational during FY 2005, thus establishing better linkage to managerial decision making. The NRC plans to utilize reports from this tool set to enhance IT investment duplication checks and to increase support for managerial selection of IT investments.

This GAO recommendation remains open.

- d. develop a structured IT investment management selection process that includes project selection criteria, a scoring model, and prioritization of proposed investments;

NRC Response and Status:

The recent update to NRC Management Directive 2.2 on CPIC has a structured IT investment management selection process that includes project selection criteria based on a three-tier investment model. Tier 3 payments are approved by the sponsoring office director (less than \$500,000). Tier 2 payments are approved by the CIO (\$500,000 to \$1,500,000). Tier 1 payments are approved by the Executive Director for Operations (greater than \$1,500,000). **The NRC has developed criteria and related processes to include an investment scoring model using ProSight as the portfolio management tool, which addresses each stage of the life cycle. As NRC moves forward and complete its PMM during FY 2005 and further implement the IT investment portfolio management program, the agency will have developed an IT selection and prioritization process, integrated with financial and program management processes, that provides insight into investments throughout their life cycle. Within the portfolio management program, the NRC identifies, monitors, and evaluates IT investment cost and schedule, compare investment performance to targets and benchmarks, and conduct reviews. The NRC categorizes and prioritizes investments and continues to execute improvement plans when managerial oversight processes indicate that an ongoing project is not realizing desired cost, benefit, or schedule results.**

This GAO recommendation remains open.

- e. document the role, responsibility, and authority of its IT investment management boards, including work processes and control, and evaluate processes that address the oversight of IT investments, such as what is outlined in practices 2.15, 2.16, 2.17, and 2.18.

NRC Response and Status:

The NRC is currently developing a streamlined and integrated set of instructions for managing the design, development, operation, maintenance, and decommissioning of information technology investments. The process is tentatively called "Project Management Methodology" (PMM), and it will provide a framework for improving agency IT investment management processes. PMM will address policies and procedures heretofore separately covered in agency policies and procedures for capital planning and investment control, enterprise architecture, security, infrastructure development process model, and systems development life cycle management methodology. Both the PMM and the IT investment portfolio management program will provide the foundation and information necessary to provide better managerial oversight of IT investments. The NRC is already working to fully establish and document the Agency IT Governance Framework that delineates roles and responsibilities.

As this new integrated set of instructions and improved policies are developed, the NRC intends to adopt the most applicable IT investment management best practices made available through GAO/AIMD-10.1.23, *Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity*, as well as other sources. Best practices that best fit the agency will be utilized in conjunction with the existing Planning, Budgeting, and Performance Management process to enhance the oversight of IT investments, consistent with practices 2.15, 2.16, 2.17, and 2.18. The new PMM instructions will fully address information technology investments throughout the life cycle with appropriate evaluations taking place at each stage. The portfolio management program will provide a much improved oversight mechanism that will better enable

managerial decision making, corrective actions, verification and validation of projects, and other activities. NRC's goal is to have the first phases of the improved IT investment management policies and processes operational during FY 2005.

This GAO recommendation remains open.

GAO Report - Nuclear Regulation - NRC Needs to More
Aggressively and Comprehensively Resolve Issues
Related to the Davis-Besse
Nuclear Power Plant's Shutdown
May 2004
(GAO-04-415)

The U.S. Government Accountability Office (GAO), in its report "Nuclear Regulation - NRC Needs to More Aggressively and Comprehensively Resolve Issues Related to the Davis-Besse Nuclear Power Plant's Shutdown," made several recommendations for addressing problems that contributed to the Davis-Besse vessel head degradation and that could occur at nuclear power plants in the future. The GAO recommendations which remained open at the end of calendar year 2004, the NRC's responses, and report of progress during the remainder of 2004 are provided below.

Recommendation 3

Develop a methodology to assess licensees' safety culture that includes indicators of and inspection information on patterns of licensee performance as well as on licensees' organization and processes. NRC should collect and analyze this data either during the course of the agency's routine inspection program or during separate targeted assessments, or during both routine and targeted inspections and assessments, to provide an early warning of deteriorating or declining performance and future safety problems.

NRC Response and Status:

As stated in the agency's comments on the draft report, the NRC continues to believe that direct involvement with licensee organizational structure and processes crosses over to a management function. In response to these comments, GAO stated in its final report (see pages 61-62) that it "understand[s] NRC's position that it is not charged with managing licensees' facilities" and was "not suggesting that NRC should prescribe or regulate the licensees' organizational structure or processes." GAO stated that its recommendation is "aimed at NRC monitoring trends in licensees' safety culture as an early warning of declining performance and safety problems." NRC agrees with aspects of GAO's recommendation, as clarified. Detecting early warning signs of declining performance and safety problems is already a key aim of NRC's reactor oversight process (ROP).

The NRC is committed to licensee development and maintenance of a strong safety culture, including commitment to safety, technical expertise, and good management. Through the years, the Commission has taken a number of actions in the area of safety culture, including the issuance of the Policy Statement entitled "Conduct of Nuclear Power Operations" (54 FR 3424, January 24, 1989). The Commission issued the policy statement to help foster the development and maintenance of a safety culture at every facility licensed by the NRC. It also stated that:

...management has the duty and obligation to foster the development of a "safety culture" at each facility and to provide a professional working environment, in the control room and throughout the facility, that assures safe operations. Management must provide the leadership that nurtures and perpetuates the safety culture.

In a 1996 Policy Statement entitled “Freedom of Employees in the Nuclear Industry to Raise Safety Concerns Without Fear of Retaliation,” the Commission stated that “...licensees and other employers subject to NRC authority will establish and maintain safety-conscious environments in which employees feel free to raise safety concerns, both to their management and to the NRC without fear of retaliation.”

The Commission recognizes the difficulty in objectively assessing certain aspects of safety culture. As noted in the agency’s comments on GAO’s draft report, NRC programs currently assess some of the fundamental elements of safety culture, such as identification and resolution of problems. NRC will continue to assess, based on objective parameters and direct observations of performance, how effectively licensees are managing safety at each facility. NRC’s pertinent assessments and related actions include:

- direct, daily observation of licensee operation of the facilities;
- problem identification and resolution (PI&R) inspections;
- followup of individual allegations and trending of site-specific allegations;
- enforcement of employee protection regulations;
- safety-conscious work environment (SCWE) assessments; and
- early and aggressive action where potential safety performance or safety culture issues are observed (e.g., recent actions taken to address safety culture issues at the Salem and Hope Creek plants).

The existing regulatory infrastructure outlined above provides a strong framework for monitoring the impact of licensee safety culture on performance. The NRC is committed to further enhancing its oversight of safety culture over the next two years.

In SECY-04-0111, “Recommended Staff Actions Regarding Agency Guidance in the Areas of Safety Conscious Work Environment and Safety Culture” (dated July 1, 2004), the staff provided the Commission with the status of NRC’s efforts to prepare a SCWE “best practices” guidance document and provide options for enhancing NRC’s oversight of SCWE and the broader area of safety culture. The Commission responded in a staff requirements memorandum on August 30, 2004, directing the staff to take actions in the SCWE and safety culture areas. Specifically, the Commission directed the staff to take the following actions:

- develop a guidance document for industry to help them understand and meet NRC’s expectations with regard to SCWE,
- continue to monitor industry efforts to assess safety culture,
- enhance the Reactor Oversight Process (ROP) treatment of cross-cutting issues to more fully address safety culture,
- develop a process for determining the need for an evaluation of licensees’ safety culture (for those plants in the degraded cornerstone columns of the ROP Action Matrix) and develop a process for conducting this evaluation, and
- continue to monitor developments by foreign regulators.

The staff is developing an action plan to implement the above and plans to share it with external stakeholders for comment. It is anticipated that the action plan will be finalized in 2005.

This GAO recommendation remains open.

Recommendation 4

Develop specific guidance and a well-defined process for deciding on when to shut down a nuclear power plant. The guidance should clearly set out the process to be used, the safety-related factors to be considered, the weight that should be assigned to each factor, and the standards for judging the quality of the evidence considered.

NRC Response and Status:

With respect to the recommendation to develop specific guidance for deciding when to shut down a nuclear power plant, the NRC acknowledges that the decision-making guidance used in the Davis-Besse situation, Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Bases," is guidance for approving license change requests. Although the NRC continues to believe that the risk-informed decision-making process in RG 1.174 is generally applicable to a wide range of decisions that the NRC makes, it would be useful to develop additional risk-informed guidance on how to address emergent issues. Therefore, additional regulatory guidance to expand the application of risk-informed decision making will be developed. This is discussed further in the response and status for Recommendation 5.

The NRC agrees that it lacked sufficient and appropriate documentation of the decision on Davis-Besse. Effective communication, including proper documentation of the decisions, will be the key to improving the accountability and credibility of NRC decisions in the future. This was one of the Davis-Besse Lessons Learned Task Force's findings, and a number of recommendations were made to correct this deficiency. The NRC is committed to making sure future decisions are documented in a proper and timely manner.

The NRC has a well-defined process in place for deciding when to shut down a nuclear power plant. Plant Technical Specifications, which are a part of the facility license, provide structure and direction to licensees as to whether and when a plant is required to enter a shutdown condition. The Technical Specifications include a wide range of plant conditions, including safety equipment availability and operability, testing and maintenance requirements, leakage requirements, and more. Licensees are well versed in the requirements of plant technical specifications, including reporting requirements to the NRC. Plants routinely perform orderly plant shutdowns in accordance with NRC requirements. In addition, NRC assesses plant performance continuously through the reactor oversight process. Plant performance is determined by analyzing inspection findings resulting from NRC's inspection program and performance indicators (PIs) reported by the licensee. Both PIs and inspection findings are evaluated based on their safety significance. The NRC determines its regulatory response in accordance with an Action Matrix that provides for a range of actions commensurate with the significance of the PI and inspection results. The Action Matrix includes an Unacceptable Performance Column. Unacceptable performance represents situations in which the NRC lacks reasonable assurance that the licensee can or will conduct its activities in a manner that protects public health and safety. Examples of unacceptable performance may include the following: (a) multiple significant violations of the facility's license, technical specifications, regulations, or orders; (b) loss of confidence in the licensee's ability to maintain and operate the

facility in accordance with the design basis (e.g., multiple safety significant examples where the facility was determined to be outside of its design basis, either due to inappropriate modifications, the unavailability of design basis information, inadequate configuration management, or the demonstrated lack of an effective problem identification and resolution program); and (c) a pattern of failure of licensee management controls to address effectively previous significant concerns to prevent the recurrence. If the NRC determines that a licensee's performance is unacceptable, then a shutdown order will be issued. NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," contains guidance on implementation of this program. If in the Commission's judgment the public health and safety so requires, the Commission may take action to revoke, suspend, or modify licenses. The regulations contain procedures for imposing requirements of this nature by order. Nevertheless, as noted above, NRC will develop additional risk-informed guidance on how to address emergent issues not covered by the Plant Technical Specifications.

In GAO's response to NRC's comments on the draft report regarding this subject, GAO agreed that existing NRC regulations provide a spectrum of conditions for plant shutdown "that could be interpreted as covering the vast majority of situations." However, GAO noted the following concerns: (1) the decision-making guidance used by NRC to shut down Davis-Besse does not provide direction on how NRC should weigh deterministic factors in relation to probabilistic factors in making shutdown decisions, and (2) the staff can arrive at very different decisions even on the basis of the same information or circumstances. Whether deterministic factors or probabilistic factors weigh more heavily in a decision is specific to the decision being made and the quality of the information available, whether deterministic and/or probabilistic. The additional risk-informed guidance will enhance consistency for future decisions.

The staff is in the process of assessing the most suitable mechanism for addressing this GAO recommendation. Discussions have been held to determine the appropriate technical disciplines needed and the appropriate scope of the guidance. The NRC is scheduled to complete this work in September 2005.

This GAO recommendation remains open.

Recommendation 5

Improve NRC's use of probabilistic risk assessment estimates in decision making by (1) ensuring that the risk estimates, uncertainties, and assumptions made in developing the estimates are fully defined, documented, and communicated to NRC decision makers; and (2) providing guidance to decision makers on how to consider the relative importance, validity, and reliability of quantitative risk estimates in conjunction with other qualitative safety-related factors.

NRC Response and Status:

The use of RG 1.174 has improved the NRC's ability to focus on safety while becoming more efficient, effective, and open. The NRC has advanced the use of probabilistic risk assessment estimates in decision making beyond that of many other regulatory agencies and remains committed to continuous improvement in this field. Therefore, the NRC intends to develop additional regulatory guidance to expand the application of risk-informed decision making. The guidance will also address the need to establish quality requirements for the risk information and will include specific instructions for documenting the decision process and conclusions. It is anticipated that the development of this guidance will take 2 to 3 years.

In addition, there is an ongoing initiative to endorse probabilistic risk assessment (PRA) standards developed by the American Society of Mechanical Engineers and the American Nuclear Society in RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities." This regulatory guide provides guidance for determining the quality of the PRAs.

NRC's response to this issue involves the integration of several ongoing, long-term risk initiatives. For example, NRC's Office of Nuclear Regulatory Research has issued, for trial use, a regulatory guide and associated Standard Review Plan chapter that provide an approach for assessing the adequacy of PRA results used in support of regulatory applications and decision making. Five licensing amendment requests have been identified as pilot applications for the use of this approach. Three have been completed and two remain. After completion of these activities, the staff will revise the regulatory guide and Standard Review Plan chapter to utilize them for subsequent licensing activities involving risk. NRC has also developed and is implementing a phased approach to achieving appropriate PRA quality and completeness.

In addition, NRC has a number of ongoing activities focused on the development of improved methods for calculating risk in support of the risk-informed regulatory decision making. These activities include:

- developing and evaluating alternative formal methods for using risk information in decision making,
- improved methods and practices for implementing human reliability analysis, and
- developing methods and tools for quantifying and assessing uncertainties in a complex engineering assessment.

This work is scheduled to be completed by June 2007.

This GAO recommendation remains open.