POLICY ISSUE
NOTATION VOTE

October 17, 2006 SECY-06-0212

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations

SUBJECT: PREPARATION OF ANNUAL REPORTS ON RADIOACTIVE MATERIALS RELEASED IN GASEOUS AND LIQUID EFFLUENTS AND IN SOLID WASTES SHIPPED FOR DISPOSAL BY COMMERCIAL NUCLEAR POWER PLANTS

PURPOSE:

To respond to the Commission request for a staff proposal for the preparation of annual reports summarizing information on the types and amounts of radioactive materials released in gaseous and liquid effluents during normal operations from nuclear power plants, and the types and amounts of solid wastes shipped by commercial nuclear power plants to low-level radioactive waste disposal sites.

SUMMARY:

The NRC sunset the reporting of similar annual reports in the mid-1990s due to their limited use and to allocate NRC resources to higher priority activities. If the Commission determines that such reports are needed, the staff has identified two alternatives for producing the reports using data submitted by licensees. Under the first alternative, the staff would compile the reports submitted annually in accordance with existing requirements in 10 CFR Part 50.36a. Under the second alternative, the staff could revise existing requirements as an e-government initiative to have licensees submit the information via a secure website.

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BACKGROUND:

As requested in the Staff Requirements Memorandum for the FY 2006 Midyear Resource Review (COMSECY-06-0017), the staff has prepared a proposal for issuing annual reports describing radioactive materials released in gaseous and liquid effluents and information on volumes of solid wastes shipped by nuclear power plants. The Commission requested that the staff consult with the Environmental Protection Agency (EPA) and State officials to ensure that this effort does not duplicate other reporting requirements. In addition, the Commission requested that the proposal include an estimate of the resources needed to prepare such annual reports routinely.

In accordance with "Technical Specifications on Effluents from Nuclear Power Reactors," 10 CFR 50.36a, nuclear power reactor licensees are required to submit annual reports on liquid and gaseous effluents. Regulatory Guide (RG) 1.21, Revision 1, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," describes acceptable formats to use in reporting the amounts of radioactive materials released in liquid and gaseous effluents and contained in solid wastes shipped for disposal. Nuclear power plants must submit their annual reports (known as Radioactive Effluent Release Reports) by May 1 of each year for the preceding year. The reports address both routine effluent releases and releases classified as abnormal occurrences. Briefly, the information typically contained in annual reports addresses the following:

- Regarding liquid and gaseous effluents, the reports contain descriptions of releases by major categories of effluents (fission and activation products, dissolved and entrained gases, radioiodines, particulates, tritium, and gross alpha activity), breakdown of releases by radionuclides and radioactivity totals, effluent discharge rates, volumes of liquid effluents released, and volumes of dilution water used during releases.

- Regarding solid wastes, the reports contain descriptions of the types of wastes (low-level waste and spent fuel), breakdown of radionuclides and radioactivity totals by types of wastes, waste volumes, number of shipments, modes of transportation, and destinations. Low-level waste is grouped in four generic categories as (1) spent resins, filter sludge, evaporator bottoms, etc., (2) dry compressible waste, contaminated equipment, etc., (3) irradiated components, control rods, etc., and (4) others.

In practice, licensees use varying formats to present the information outlined in RG 1.21. In some instances, reports present additional information, such as in differentiating the amounts of solid waste shipped for burial directly from the plant versus that shipped by a waste processor on behalf of the utility.

Until the early 1990s, the NRC published yearly reports on radiological effluents released by nuclear power plants and estimated doses to the public. Brookhaven National Laboratory compiled the information on effluents for the NRC. The annual compilations were published as NUREG/CR-2907, "Radioactive Materials Released from Nuclear Power Plants," ending in December 1995 with Volume 14 for effluents released in 1993. The yearly reports contained tabulations of gaseous and liquid effluent releases, volumes and activity levels of solid wastes

shipped for disposal, net electrical and thermal energy generation, and supporting data as reported by licensees. The staff seldom used these reports and had few indications of stakeholder interests in or the use of the reports.

The staff envisions that annual reports on gaseous and liquid effluents and solid waste disposal could serve multiple purposes. The NRC could use them to communicate information to the public by comparing abnormal releases through unmonitored pathways with radioactivity levels associated with monitored effluents and wastes shipped for disposal.

DISCUSSION:

If the Commission directed resumption of the development and distribution of annual reports, the staff could pursue a number of alternatives to prepare the reports. These include:

- using NRC staff or contractor support to compile data characterizing liquid and gaseous effluents and solid wastes reported by commercial nuclear power plant licensees, and

- revising the regulations to require licensees to submit the data using a secure website and using software to compile and assess the data.

Under both approaches, the staff would plan to make the information accessible on the NRC Web site. This approach builds on the wide use of the NRC Web site and provides an easier method for processing and disseminating such information. This approach will result in more comprehensive availability of data, provide the means to evaluate trends among power plants, and offer the means to access information contained in annual effluent release reports via a process that cannot be accomplished using reports published by conventional methods.

The Environmental Protection Agency (EPA) Office of Drinking Water does not routinely compile information on the presence of radioactivity in ground and surface water associated with nuclear power plant operations. However, EPA has conducted studies on radioactivity in water in support of specific rulemaking activities and projects, and it routinely monitors radioactive effluents from Federal facilities as part of its mandate.

For additional information on solid wastes, the staff has considered data compiled by other organizations, including the Department of Energy (DOE), EPA, Low-Level Waste Compacts and Unaffiliated States, and the Conference of Radiation Control Program Directors (CRCPD). Based on a review of the type of information available from such sources and the merits of using such information, the data extracted from annual effluent release reports submitted by each nuclear power plant licensee, as opposed to using data from other sources, is preferred to ensure that waste volumes and activity levels reported by the NRC are consistent with that provided in annual effluent reports issued by licensees.

However, such information may not be in agreement with data presented in DOE's Manifest Information Management System (MIMS) database, or that published by States and Low-Level Waste Compacts. The information in the MIMS database reflects the use of the uniform

shipping manifest[1] in describing low-level wastes shipped for disposal. Differences between yearly waste volumes and radioactivity levels shipped by nuclear power plants and that reported by disposal sites and DOE are associated with waste processing done by waste brokers and processors on behalf of nuclear utilities. Waste processing methods that could result in differences in waste volumes or radioactivity levels include decontamination, material segregation, volume reduction, storage for radioactive decay, etc. As a result, the annual effluent summary reports issued by the NRC would have to provide explanations for such differences and refer to the MIMS database Web site for waste volumes and activity levels actually reported by disposal sites. The MIMS database can be accessed via http://mims.apps.em.doe.gov.

I. Alternative A

Manual Compilation of Effluent and Waste Data

The staff proposes to use a modified version of a current program, based on MS Access, to generate annual reports characterizing the amounts of radioactivity discharged in gaseous and liquid effluents from commercial nuclear power plants, and solid waste shipped for disposal from nuclear power plants. This database was developed by the staff to maintain information extracted from annual effluent release reports submitted by nuclear power plants for all operating power plants from 2001 to 2004. This information is available through the NRC's Radiation Exposure Information and Reporting System (REIRS) database, via http://www.reirs.com/effluent. This approach would offer some savings and allow faster update of the program.

Modifications would include adding features for displaying trends over specific years, facilitating the compilation of yearly reports, reformatting screen displays, and incorporating provisions for the automated preparation of annual effluent reports. The program would be used by the staff to generate annual summary reports, which would be uploaded on the NRC Web site as self-contained read-only data files (e.g., as pdf or HTML). The annual reports posted on the NRC Web site would not contain sensitive information and would not provide any links to any databases. Finally, the staff could update the program as needed, such as by expanding query functions or by providing more details on current contents.

Resource Estimates - Alternative A

Approximately 1.0 FTE and $100K are needed in Fiscal Year (FY) 2007, and 0.05 FTE and $40K each year thereafter for maintenance. The Commission has approved the necessary funding from available midyear resources, as indicated in Staff Requirements COMSECY-06-0017 - Results of the FY 2006 Midyear Resource Review. The funding will be made available pending the approval of this proposal, as may be modified by the Commission. The staff FTE for the initial year to cover the development of the of the program will be allocated from the

[1] NUREG/BR-0204, Revision 2, "Instructions for Completing NRC's Uniform Low-Level Radioactive Waste Manifest," issued July 1998. The use of the uniform manifest is specified in 10 CFR 20.2006, "Transfer for Disposal and Manifests."

following reactor licensing tasks: EE&GC: OpE Program Support, EE&GC: Event Review & Follow-up, and General IT: Rx Licensing. There would be a moderate impact on the Operating Experience Program by deferring planned infrastructure program improvements. These improvements resulted from a recent program effectiveness review and include development of guidance for event screening and Issues for Resolution (IFRs), maintenance of the Operating Experience Gateway web site, and revising NUREG-1022 "Event Reporting Guidelines 10 CFR 50.72 and 50.73." The FTE for the following years will be budgeted, starting in FY 2008, via the PBPM process.

II. Alternative B - Web-based System

Development of an Effluent and Solid Waste Database

This alternative proposes the development of a web-based database to generate annual reports characterizing the amounts of radioactivity discharged in gaseous and liquid effluents from commercial nuclear power plants, and solid waste shipped for disposal from nuclear power plants. This alternative would use the same source of information on effluents and solid waste as discussed earlier. The database would be accessible via a secure direct link on the NRC Web site. Licensees could be required, through a rulemaking, to submit information via a secure web page, similar to the secure database used for Category 1 to 3 radioactive sources, as described in the National Source Tracking System. Finally, the staff could update the database as needed, such as by expanding query functions, providing more details on current subjects, or accommodating supplemental data. In developing the database, the staff would follow:

(1) the Capital Planning and Investment Control Process (CPIC) using the requirements of Management Directive 2.2, "Capital Planning and Investment Control."

(2) Project Management Methodology (PMM) using the guidance on the PMM website (http://www.internal.nrc.gov/pmm) and requirements of Draft Management Directive 2.8, "Project Management Methodology."

(3) the requirements of Management Directive 2.1, "Information Technology Architecture."

This approach will ensure that the development of the database is consistent with the CPIC process[2] and NRC Federal Information Security and Management Act (FISMA) of 2002. However, this approach would require a longer developmental period to complete the design,

[2] The database would be based on a production-grade database management system, such as MS SQL, which will provide more robust security and scalability. The database would offer data and query functions beyond that offered by a program using MS Access. The database would provide the means to conduct online searches and queries, display trends over specific years, customize the production of yearly reports, offer graphic data displays, and include provisions for the local printing of reports or saving them as electronic files. The staff would work with the OIS Web Content Services Team (WCST) in identifying the requirements for putting static and dynamic pages of the database on the NRC Web site, and defining page formats of the database's annual report results using approved NRC templates for public site content. A CPIC screening form will be submitted to initiate this effort, and the staff will plan the development of the database with WCST. Once the CPIC screening form is approved, the staff will proceed with the business case for the development effort. When the business case is approved, the staff will move forward with the necessary documentation required for certification and accreditation before expending resources.

assessment, approach, procurement, and development of the database. The staff would move forward with the necessary documentation required for certification and accreditation before expending resources on the development effort.

Resource Estimates - Alternative B

At this time, only preliminary cost estimates are available because the cost for the development of the database would be driven by a rulemaking and business case requirements, to include security, established through the CPIC process. For these reasons, the staff has not yet developed an independent government cost estimate. If the staff begins work on the development of alternative B in FY 2007, the program will be budgeted through the add/shed process. The FTE for the following years will be budgeted, starting in FY 2008, via the PBPM process. The following table provides a preliminary estimate of the costs associated with Alternative B.

Timeframe	**Type of Report/Activity**	**Level of Effort/Funding**	
		Staff FTE and Funding	**Contractor Support**
Rulemaking, 2-year effort	Development of regulations and regulatory guidance	2.5 ($50K)	n/a
Initial year	Gaseous and liquid effluents, and solid wastes	4.0	$700K(*)
Subsequent years	Gaseous and liquid effluents, and solid wastes	0.1/yr	$100K/yr
Three-year intervals	FISMA re-certification of database	0.1	$100K

(*) Estimate assumes $500K for the purchase of software and modifications to address data processing functions, and $200K for the initial FISMA security certification.

SCHEDULE:

If the Commission decides to proceed with the development of annual reports, the staff envisions that the initiation of the work could start in FY 2007, with the first annual report being available in late FY 2007 under Alternative A.

For Alternative B, the schedule is difficult to define given that the development of this alternative would be dependent on the outcome of the rulemaking to revise reporting requirements and the CPIC process and FISMA requirements attendant to the business case review. It is expected that the development effort for the database would be contracted out, thereby, requiring more time for the procurement process and selection of a qualified vendor. Given these uncertainties, it is estimated that the rulemaking effort would take about 2 years to complete, and another year would be needed to obtain the necessary documentation required for the certification and accreditation of the database. Consequently, no definitive schedule is provided at this time.

COORDINATION:

The Office of the General Counsel has reviewed this Commission paper and has no legal objections. The Office of Information Services has reviewed this Commission paper and has no objections. The Chief Financial Officer has reviewed this package and agrees with the preliminary resource estimates, given the funding set-aside provisions of the Staff Requirements Memorandum for the FY 2006 Midyear Resource Review (COMSECY-06-0017).

RESOURCES:

The staff's recommendation is to not issue annual reports on gaseous, liquid, and solid effluents. No resources are associated with the recommended option.

RECOMMENDATIONS:

This paper presents a proposal for preparing annual reports of liquid and gaseous effluents and disposal of solid wastes associated with the operation of commercial nuclear power plants. The staff makes the following recommendations:

(1) At this time, the staff does not recommend proceeding with the development of a process to prepare annual reports on effluents and solid waste generated by commercial nuclear power plants.

(2) If the Commission decides to proceed with the development of annual reports, the staff recommends Alternative A as the preferred approach. NRR would implement and manage the compilation of data on effluents and solid waste, generate annual effluent reports, and post annual reports on the NRC Web site.

/RA/

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