December 17, 2007

MEMORANDUM TO: Chairman Klein
Commissioner Jaczko
Commissioner Lyons

FROM: Luis A. Reyes ***/RA/***
Executive Director for Operations

SUBJECT: RULEMAKINGS THAT WILL PROVIDE THE GREATEST EFFICIENCIES TO COMPLETE THE COMBINED LICENSE APPLICATION REVIEWS IN A TIMELY MANNER

This memorandum is in response to Additional Recommendation 2 in the staff requirements memorandum (SRM) entitled, "Staff Requirements—COMDEK-07-0001/COMJSM-07-0001—Report of the Combined License Review Task Force," dated June 22, 2007 (ML071760109). In Additional Recommendation 2, the Commission stated it has approved rulemaking to resolve issues that are generic to combined license (COL) applications. The Commission directed the staff to propose those rulemakings that will provide the greatest efficiencies, on such subjects as non-proliferation risks of nuclear power, the need for power, long term storage of spent fuel, reprocessing, and waste confidence, and assess the impact of pursuing such rulemaking initiatives on the staff's ability to complete the COL reviews in a timely manner.

The U.S. Nuclear Regulatory Commission (NRC) staff continues to believe that no additional new regulations or revisions to current regulations are necessary to complete reviews of existing applications for design certifications or COLs, or to license any of the current prospective light-water reactor (LWR) designs. Current regulations and rulemakings in progress (*e.g.*, Title 10 to the *Code of Federal Regulations* [10 CFR] 73.55), legal precedent, and regulatory guidance exist to adequately support these licensing actions. However, the staff is currently developing a licensing strategy for the Next Generation Nuclear Plant and has been conducting or expects to begin pre-application reviews and technical interactions with the U.S. Department of Energy (DOE) on several prospective advanced reactor designs (*e.g.*, high temperature gas reactors (HTGRs), liquid metal reactors (LMRs), and advanced LWR designs) and may identify additional rulemakings from those efforts.

To address the direction provided in the subject SRM, the staff considered whether any of the current issues were amenable to a meaningful generic resolution through rulemaking. In its deliberations, the staff did not consider areas in which a funded rulemaking effort already exists.

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Potentially Beneficial Rulemakings

Based on its deliberations, the staff believes that the following list of issues represents areas in which the greatest licensing efficiencies could be gained through new rulemaking.

Waste Confidence Rule

The Waste Confidence Rule (10 CFR 51.23) was promulgated in 1984 and amended in 1990 to codify the Commission's generic determination that, if necessary, spent fuel generated in any reactor can be stored without significant environmental impacts for at least 30 years beyond the licensed life for reactor operation (which may include the term of a renewed license) and to indicate that the Commission believes that at least one mined geologic repository will be available within the first quarter of the 21st century to receive such waste. The rule was reviewed in 1999, at which time the Commission indicated that experience and developments since 1990 confirmed the Commission's findings in 1990.

While DOE projects an opening date for the Yucca Mountain repository (if it is licensed) around 2020, a high degree of uncertainty remains regarding the timing of the opening of a specific geologic repository. In its SRM-M070822 dated September 7, 2007 (ML072530192), the Commission expressed its view that it is appropriate to update the NRC's waste confidence findings and instructed the staff to address the topic in this paper since waste confidence is a generic matter that could continue to benefit from treatment in rulemaking. The NRC has recently denied a petition for rulemaking requesting changes to the waste confidence decision. Based on this recent denial by the Commission, the staff does not believe that the waste confidence decision necessarily introduces a significant short-term problem for processing of COL applications. However, in recognition of the likely long-term inefficiencies of responding to potential questions and petitions directed to the existing waste confidence decision, the staff will evaluate possible updates to the decision to account for new developments. The assessment/update might consider: whether the NRC's view that storage of spent fuel is environmentally sound for at least 100 years remains valid; whether spent fuel from expected new reactors is likely to be sufficiently similar to that which the NRC has assessed in the past that the NRC view that storage is environmentally sound for at least 30 years beyond the licensed life for reactor operation (including the term of renewed licenses) remains valid; and whether the "first-quarter of the 21st century" finding should be modified or updated. A possible schedule for such an update could include the following milestones:

January 2008 - Begin reassessment
July 2008 - Draft assessment published for public comment (75-day comment period)
November 2008 - Final package to Commission[1]

Environmental Issues

Alternative site reviews: Alternative site analysis is an important aspect of the NRC's environmental review of proposed nuclear power plant sites. Provisions in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," implement the National Environmental Policy Act (NEPA) and require consideration of alternatives to proposed actions. In addition, 10 CFR Part 51 requires that the applicant

[1] This milestone could be delayed if there are a large number of comments.

evaluate alternative sites in its environmental report to determine whether there is any obviously superior alternative to the site proposed. The issue of what constitutes an adequate alternative site review under NEPA received considerable attention from the NRC and the Federal courts in the 1970s, culminating in 1980 with the publication of a proposed rule for alternative site reviews. Shortly thereafter, progress on this issue stopped because of the lack of new nuclear power plant applications. In light of nuclear industry restructuring in a deregulated market, nuclear plant owners and operators are considering building and operating exempt wholesale generators (EWGs) that will not be rate-regulated by States. The specific purpose for a utility to build a plant to supply power to its service area is different from that of an organization that proposes to build and operate EWGs in today's regulatory environment. EWGs are generators authorized by the Federal Energy Regulatory Commission to sell power at wholesale market based rates. Such plants are sometimes called "merchant" plants. The staff believes that clarifying the NRC regulatory criteria for the NEPA-required alternative site review could help reduce licensing uncertainty. Such action could support a timely and more efficient NRC review, and may decrease the resource expenditure for the hearing on an early site permit (ESP) application or a COL application that does not reference an ESP.

Tables S-3 and S-4 of 10 CFR Part 51[2]: In the early 1970s, the NRC promulgated Tables S-3 and S-4 of 10 CFR Part 51 to generically address the environmental impacts of the uranium fuel cycle and transportation of fuel and waste for LWRs. Such impacts were to be considered in environmental analyses for construction permit applications. Table S-3 lists of the environmental data to be used as the basis for evaluating the environmental effects of the front and back ends of the uranium fuel cycle in an LWR. Table S-4 lists the environmental impacts of the transportation of unirradiated fuel to, and spent fuel and other radioactive wastes from, an LWR. The staff uses these impacts when weighing the environmental costs of licensing a reactor. Since the tables were last updated, a number of issues have emerged, prompting the staff to consider rulemaking in this area. These issues include consideration of the following areas which, in the absence of revisions to the tables, are addressed in the review of each ESP or COL application:

- High-burnup fuel and increased enrichments
- Cumulative impacts associated with transportation of high-level waste in the vicinity of a prospective permanent repository
- Accident analyses
- Health effects
- Economic and socioeconomic issues
- Cumulative impacts
- Changes in cask design
- Occupational doses
- Decommissioning impacts

[2] Note that the staff is currently preparing a response to a petition for rulemaking (PRM 51-1) to revise Table S-3 for reasons unrelated to the issues described in this document.

Hearings on Inspections, Tests, Analyses, and Acceptance Criteria

The NRC has recently revised 10 CFR 52.99 and 10 CFR 52.103, which govern the process for closure of inspections, tests, analyses, and acceptance criteria (ITAAC). The revised regulations are intended to be an integrated set of requirements to better implement the intent of Congress, as reflected in Section 185.b and Section 189.a(1)(B) of the Atomic Energy Act (AEA). The AEA requires that the NRC utilize a licensing and hearing process which provides a reasonable opportunity for interested members of the public to request a hearing and have their concerns about ITAAC completion resolved in an expeditious manner which is fair to all interested parties. The final Part 52 rule statements of consideration inadvertently failed to include the statement that the NRC did not intend to allow late-filed contentions on ITAAC under 10 CFR 52.103(a), although this was always the intent and the basis for the revised 10 CFR 52.99 and 10 CFR 52.103 provisions. The Office of the General Counsel (OGC) believes strongly that this issue could provide significant licensing efficiencies and therefore plans to recommend that this be accomplished directly by a rule change providing a specific prohibition on late-filed contentions for hearing requests on ITAAC under 10 CFR 52.103(a).

Future Reactor Issues

As stated previously, the staff has been conducting or expects to begin pre-application reviews and technical interactions with the DOE on several prospective advanced reactor designs. The following areas have been identified as rulemakings that may provide licensing efficiencies for these advanced reactors.

Nuclear Insurance Requirements

The regulations for decommissioning funding may need to be reviewed because of the new types of designs that may be built. The current requirements in 10 CFR 50.75, “Reporting and Recordkeeping for Decommissioning Planning,” provide methods for determining the required amount of decommissioning funding assurance based on power level and whether the applicant’s reactor is a pressurized water reactor (PWR) or a boiling water reactor (BWR). Therefore, if new applications for a commercial nuclear reactor are of a design that is not a PWR or a BWR, new formulas may need to be constructed to determine the proper amount of decommissioning funds to be set aside.

Annual Fees

The fees applicable to reactors are service fees (10 CFR Part 170) and annual fees (10 CFR Part 171). The fees authorized by 10 CFR Part 170, “Fees for Facilities, Materials, Import and Export Licenses, and Other Regulatory Services under the Atomic Energy Act of 1954, As Amended,” recover the NRC’s costs for specific services rendered to the identifiable applicants and licensees, including pre-application activities, reviews of applications, inspections (pre- and post-licensing), full-cost recovery for project managers, and mandatory hearings. The fees authorized by 10 CFR Part 171, “Annual Fees for Reactor Licenses and Fuel Cycle Licenses and Materials Licenses, Including Holders of Certificates of Compliance, Registrations, and Quality Assurance Program Approvals and Government Agencies Licensed by the NRC,” are annual fees that apply only after a license is issued. These fees recover the NRC’s costs for generic activities and other costs not recovered through 10 CFR Part 170 fees.

The NRC should review these regulations to address the prospect of small, modular power plants that could be built. Annual fees are charged for each operating power reactor. Therefore, under the current regulations, an operator of a small, modular reactor with a low power level (30 - 400 MW(e)) would be required to pay the same annual fee as an operator of a large (greater than 800 MW(e)) reactor. This could result in a disproportionate burden on licensees with small, modular reactors. This potential disparity should be assessed to determine if some adjustment in fee structure would be appropriate.

Operator Staffing

The requirements in 10 CFR 50.54(m) specify minimum operator staffing requirements for nuclear power reactors. This regulation should be reviewed to address the prospect of small, modular power plants that could be built.

Emergency Preparedness

The requirements in 10 CFR 50.47, "Emergency Plans," address the required size of the emergency planning zone and are based on the types of plants in operation today. This regulation should be reviewed to address the prospect of small, modular power plants that could be built.

Physical Security

The requirements in 10 CFR Part 73, "Physical Protection of Plants and Materials," establish physical security requirements for nuclear power reactors. The requirements are based largely on the types of plants in operation today. This regulation should be reviewed to address the prospect of small, modular power plants that could be built.

Other Issues Considered

In addition, the staff and OGC considered the following additional areas, but did not believe that rulemaking was likely to provide significant licensing efficiencies:

- Environmental Issues
  - Need for power
  - Alternative energy sources
  - Generic disposition of severe accident impacts
  - Generic disposition of radiological health effects
  - Development of generic environmental impact statement for new license applications
- Fuel Issues
  - Long term storage of spent fuel
  - Reprocessing
  - Use of mixed-oxide fuel in nuclear power plants
- Financial qualification requirements

The staff recognizes that rulemaking in the areas identified by the staff may improve the efficiency of the staff's licensing reviews and possibly limit the number of issues subject to litigation in a licensing hearing. In the short term, however, the staff believes that any efficiency

gained from new rulemaking would not justify a diversion of resources from ongoing and upcoming design certification and COL application reviews, or from ongoing work on rulemaking and guidance development. Diversion of already-dedicated resources could seriously delay the staff and prevent the timely completion of these design certification and COL reviews. In addition, some of these rulemakings are likely to be controversial and therefore may not be complete by the time the initial group of new reactor licensing hearings begins, thus providing limited benefit. The one exception is the rulemaking on late-filed ITAAC contentions. The staff and OGC plan to prepare a direct final rule and provide it to the Commission for approval in the near future. The staff believes rulemaking in the other identified areas should be considered for the future, if and when additional resources become available.

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