

December 10, 2010

MEMORANDUM TO: Brent Clayton, Chief  
Environmental Technical Support Branch  
Division of Site and Environmental Reviews  
Office of New Reactors

FROM: Scott C. Flanders, Director */RA/*  
Division of Site and Environmental Reviews  
Office of New Reactors

SUBJECT: ADDRESSING CONSTRUCTION AND PRECONSTRUCTION  
ACTIVITIES, GREENHOUSE GAS ISSUES, GENERAL CONFORMITY  
DETERMINATIONS, ENVIRONMENTAL JUSTICE, NEED FOR  
POWER, CUMULATIVE IMPACT ANALYSIS, AND  
CULTURAL/HISTORICAL RESOURCES ANALYSIS ISSUES IN  
ENVIRONMENTAL IMPACT STATEMENTS

The Office of New Reactors has determined that guidance used by the staff in preparing Environmental Impact Statements (EISs) supporting the review of Early Site Permit (ESP) and Combined Operating License (COL) applications needs to be updated in response to Commission Orders, other applicable regulatory standards, and to clarify guidance in existing Environmental Standard Review Plans (ESRPs). Accordingly, this memorandum provides guidance to the Division of Site and Environmental Reviews (DSER) staff on incorporating and addressing construction and preconstruction activities; greenhouse gas issues; general conformity determinations; environmental justice; need for power; cumulative impact analysis; and cultural/historical resource analysis issues in environmental impact statements.

CONTACT: Mark Notich, NRO/DSER  
301-415-3053

Enclosure: As stated

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NAME	MNotich	GHawkins <i>/gdh/</i>	SPrice	BClayton	SFlanders
DATE	05/13/2010	03/22/2010	05/13/2010	05/17/2010	12 /10/2010

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**GUIDANCE ADDRESSING CONSTRUCTION AND PRECONSTRUCTION  
ACTIVITIES; GREENHOUSE GAS ISSUES, GENERAL CONFORMITY  
DETERMINATIONS, ENVIRONMENTAL JUSTICE, NEED FOR POWER,  
CUMULATIVE IMPACT ANALYSIS AND CULTURAL/HISTORICAL RESOURCES  
ANALYSIS ISSUES IN ENVIRONMENTAL IMPACT STATEMENTS**

The Office of New Reactors has determined that guidance used by the staff in preparing Environmental Impact Statements (EISs) supporting the review of Early Site Permit (ESP) and Combined Operating License (COL) applications needs to be updated in response to Commission Orders, other applicable regulatory standards, and to clarify guidance in existing Environmental Standard Review Plans (ESRPs). Accordingly, this memorandum provides guidance to the Division of Site and Environmental Reviews (DSER) staff on incorporating and addressing construction and preconstruction activities; greenhouse gas issues; general conformity determinations; environmental justice; need for power; cumulative impact analysis; and cultural/historical resource analysis issues in environmental impact statements.

**Background**

After recently drafting several EISs, the staff identified areas where additional guidance or clarification of existing guidance is needed to facilitate more efficient and effective preparation of our EISs. Specifically, the staff identified that additional guidance was needed for the assessment of construction impacts, carbon dioxide and greenhouse gas issues, conformity determinations, environmental justice, need for power, cumulative impact assessments, and cultural/historical resource issues.

This guidance is intended for staff use in conducting environmental reviews associated with ESP and COL applications. It should be used to complement existing NRC guidance such as that contained in NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants." Use of this guidance will assist the staff in addressing certain aspects of the environmental reviews for ESP and COL applications that: (1) have evolved since the last update to NUREG-1555, or; (2) have been identified in conducting the first several reviews of ESP and COL applications. This guidance should help ensure that the analyses and review procedures for the issues addressed herein are appropriately standardized, and that these issues are addressed consistently and adequately in the resulting EISs.

This guidance is intended to be used on an interim basis until it is incorporated into future updates to NUREG-1555. This guidance may be revised and updated as the need arises to clarify the content or incorporate modifications approved by NRC management. Feedback from the staff, particularly those charged with implementing the guidance, is encouraged and should be provided to the Chief, Environmental Technical Support Branch, NRO/DSER.

**Assessment of Construction Impacts**

Section 185 of the Atomic Energy Act (AEA) requires that NRC grant construction permits to applicants for licenses to construct or modify production or utilization facilities, if the applications for such permits meet the NRC's requirements. To prevent the construction of production or utilization facilities before a construction permit is issued, the NRC developed a regulatory definition of construction in 1960 which defined construction as including the pouring of the foundation for, or the installation of, any portion of the permanent facility on the site but as not including site exploration, site excavation, preparation of the site for construction of the facility, construction of roadways, railroad spurs, and transmission lines; non-nuclear facilities and

temporary buildings. After the enactment of NEPA, the NRC adopted an amendment to that definition in 1972, which stated that no person shall effect commencement of construction of a production or utilization facility on the site on which the facility will be constructed until a construction permit has been issued. In a change from the previous definition commencement of construction was defined as any clearing of land, excavation, or other substantial action that would adversely affect the natural environment of a site and construction of non-nuclear facilities for use in connection with the facility. In 1974, the NRC created the limited work authorization (LWA) process which allowed for site preparation, excavation, and certain other on-site activities to proceed before issuance of a construction permit, but after NRC review and approval.

On October 9, 2007, the U.S. Nuclear Regulatory Commission (NRC or Commission) issued revisions to its rules related to LWAs. Under the revised LWA rule, the NRC authorization would only be required before undertaking activities that have a reasonable nexus to radiological health and safety and/or common defense and security for which regulatory oversight is necessary and/or most effective in ensuring reasonable assurance of adequate protection to public health and safety or common defense and security. Many of the rule's most important provisions are related to changes in the NRC's definition of "construction". These changes have significant ramifications on the format and content of an EIS even when there is no request for an LWA. The most significant of these changes is that activities that are now defined as preconstruction will be discussed as cumulative impacts in the EIS whereas before the rule change these activities were analyzed as direct impacts. The reasoning for this change is that activities defined as preconstruction do not have a reasonable nexus to radiological health and safety and/or common defense and security and thus, are not within the NRC's authority to regulate.

On February 23, 2009, "Interim Staff Guidance [ISG] on the Definition of Construction and on Limited Work Authorizations" was issued in the *Federal Register* (74 FR 8124) and is available on the Agencywide Documents Access and Management System, accession number ML082970729. The ISG provides guidance regarding the definition of construction including the delineation of preconstruction activities and the identification of those activities requiring prior approval of the NRC. The ISG also provides guidance on the information applicants should provide regarding impacts from preconstruction activities and the information applicants should provide concerning cumulative impacts with respect to preconstruction activities.

As defined in 10 CFR 50.1 (a)(1), activities constituting construction include the driving of piles, subsurface preparation, placement of backfill, concrete, or permanent retaining walls within an excavation, installation of foundations, or in-place assembly, erection, fabrication, or testing, which are for: safety-related structures, systems or components (SSCs) of a facility, as defined in 10 CFR 50.2. Additionally, 10 CFR 50.10(a)(2) explicitly identifies certain activities the NRC does not consider construction, such as site investigations that are required by 10 CFR 100.23(c) and excavation. These are considered preconstruction activities and do not require NRC approval. Consequently, the NRC evaluates preconstruction impacts as cumulative impacts, and not as direct impacts resulting from NRC's federal action. Construction and preconstruction issues will be addressed in upcoming EISs in a manner consistent with the revised LWA rule. As discussed in the preamble to the 2007 rule, the NRC's authority is limited to activities that have a reasonable nexus to radiological health and safety or common defense and security. As a result, the definition of construction was modified to reflect the scope of the NRC's authority. Impacts from construction activities will be addressed in the construction and cumulative portions of the EISs. Impacts from preconstruction activities must be addressed in the portions of the EIS concerning cumulative impacts.

The NRC staff expects that the U.S. Army Corps of Engineers (Corps) will be a cooperating agency on the majority of upcoming EISs in accordance with the updated Memorandum of Understanding (MOU) signed with the NRC (ML082540354). The NRC and the Corps established the cooperative agreement because both agencies have concluded it is the most effective and efficient use of Federal resources in the environmental review of a new nuclear power plant. The goal of this cooperative agreement is the development of one EIS that provides all the environmental information and analysis needed by both agencies to make their regulatory decision (i.e., NRC license decision and the permit decision in the Corps' Record of Decision (ROD) documentation). The Corps has indicated that they consider all impacts of preconstruction and construction activities as direct impacts from their federal action. Therefore, when the Corps is a cooperating agency, the impacts from preconstruction are initially discussed in detail in EIS Chapter 4 to satisfy the Corps' needs and then are also addressed in the cumulative impacts analysis in Chapter 7 for the NRC's needs. Absent the Corps' involvement as a participating agency the NRC would address the impacts of preconstruction only in Chapter 7.

The following guidance is premised on the assumption that the Corps will be acting as a cooperating agency on preparation of future EISs. Under the terms of the MOU, when the Corps is acting as a cooperating agency, "[t]he NRC will be responsible for drafting sections and requesting additional information to the extent that the NRC believes the analysis is needed and would normally be required by the NRC if the Corps were not involved. If the Corps believes that additional analysis is needed, but the NRC does not agree that such analysis would be required under the regulatory procedures of the NRC, such analysis will be the responsibility of the Corps."

General guidance for addressing construction/preconstruction issues in specific EIS chapters is included below. More detailed guidance is provided for the review team on the EARRTH SharePoint website under Roadmap for Reviews.

#### Chapter 2 (Affected Environment)

- The description of the site and environs in Chapter 2 is based on the Applicant's description of the affected environment in the ER. This description will also serve as the "baseline" of the cumulative impacts evaluation in Chapter 7.
- Focus the level of detail for elements in Chapter 2 commensurate with the impact levels presented in Chapters 4 and 5. For example, for a LARGE impact to a resource area related to construction or operation of the station in Chapter 4 or 5, the appropriate baseline information in Chapter 2 needs to be better defined.
- The Corps may provide information to be included in Chapter 2 in order to meet their impact assessment needs.

#### Chapter 3 (Site Layout and Plant Description)

- Chapter 3 will characterize the activities for the principal SSCs to provide the requisite background for the assessment of environmental impacts. This characterization will include descriptive information, a discussion of construction and preconstruction activities associated with the building of the SSC, as well as, a discussion of the operational

performance of the SSC. The purpose of these discussions is to lay the groundwork for the assessment of impacts in Chapters 4 and 5.

#### Chapter 4 (Construction Impacts at the Proposed Site)

- Chapter 4 will include a discussion of the MOU with the Corps including its purpose and why the two agencies agreed to update the MOU to include the cooperating agency approach.
- Include a discussion of how and why the EIS addresses the impacts of preconstruction activities in Chapter 4. The discussion should explain how each agency establishes the scope and structure of their NEPA review from their enabling legislation.
- Provide discussions in the appropriate areas about activities for which the applicant expects to need a Corps permit (e.g., dredging, filling, installing culverts, etc.).
- In the discussion for each resource area (land use, hydrology, etc.), text should be added to Chapter 4 that describes:
  - the basis and conclusion regarding the combined impact level of construction and preconstruction activities (the conclusions are drawn by the review team, which includes NRC and Corps personnel, as well as, NRC contractors)
  - for any resource area where the review team concludes the combined impact level is SMALL, no further breakdown of impacts between construction and preconstruction is needed and the NRC staff will conclude the impact from NRC authorized construction activities is SMALL.
  - For any resource area where the review team concludes the combined impact is greater than SMALL, a statement concluding the impact level for the NRC authorized construction activities and the basis for the NRC staff's conclusion must be presented.

In general, more detail regarding the analysis/bases/conclusions should be provided for those activities where the overall impact is greater than SMALL. For resource areas where the impact category level is greater than SMALL, the impact (including supporting analysis/bases/conclusions) resulting from construction activities will be discussed separately; for example, if the overall effects of preconstruction and construction on a particular resource area are MODERATE, then the NRC will also assess and draw a conclusion regarding the effects solely from NRC defined construction activities on the particular resource area. When the overall impact category level is SMALL, then the discussion regarding the NRC related construction impacts may be relatively brief and no further detailed discussion is necessary.

A summary table at the end of Chapter 4 will be used to characterize construction and preconstruction impacts.

#### Chapter 5 (Operations Impacts)

- Chapter 5 will include a discussion of operational impacts from NRC authorized activities.

## Chapter 7 (Cumulative Impacts)

- Chapter 7 will include a discussion explaining the assessment of cumulative impacts relying, in part, on inputs from earlier sections of the EIS. In the introduction to Chapter 7, a table will be presented that includes all past, present, and reasonably foreseeable projects that occur within the defined geographic area of interest within the established time period. Then there will be a discussion by resource area using the following format:
  - Baseline -The description of the Affected Environment in Chapter 2 serves as the baseline for the cumulative impacts assessment;
  - NRC Authorized Increment - The incremental impacts related to the NRC authorized construction activities are SMALL/MODERATE/LARGE (S/M/L) as discussed in detail in Chapter 4;
  - The impacts from operational activities are S/M/L, as discussed in detail in Chapter 5;
  - Overall Cumulative Impacts Assessment – The combined impacts from construction and preconstruction are S/M/L, as described in Chapter 4. In addition to the impacts from construction, pre-construction, and operation, the cumulative analysis also considers other past, present, and reasonably foreseeable future actions within the defined geographic area of interest that could contribute to cumulative impacts. This discussion will include overall S/M/L conclusions that will reflect the “cumulative” effects on each of the resource areas (appropriately considered in terms of space and time, and appropriately scaled in terms of significance); and
  - The final section of Chapter 7 should include a summary table of the cumulative impacts. This will be used as part of the comparison of sites in Chapter 9. Text associated with the table will discuss the project’s incremental contribution to the impact rating and will provide a basis for MODERATE or LARGE impact ratings.

## Chapter 9 (Alternatives)

The staff has developed a guidance document for alternative reviews (ML100840031) for Chapter 9 of the EIS. For the alternative sites:

- Alternative transmission line routing is no longer evaluated because transmission lines are not NRC authorized construction. Transmission line routing for the primary site is analyzed in Chapter 7, Cumulative Impacts, but alternative routing is not.
- In each resource area, the assessment will address cumulative impacts (including construction, pre-construction, operation at the site, and other projects as necessary for the cumulative impacts) and a single impact level will be determined.
- To support the discussion of cumulative impacts for alternate sites, a table will be included for each site that lists any nearby projects (Federal and non-Federal) that were identified and considered in the impact analysis.

## Chapter 10 (Conclusions and Recommendations)

- Chapter 10 will summarize the conclusions set forth in the EIS and state the staff's recommendations concerning the proposed action.
- Discussions of unavoidable adverse impacts, costs, and benefits will be developed in terms of preconstruction and construction activities.
- The following language will be included in EIS Section 10.2.1, Unavoidable Adverse Impacts during Construction and Preconstruction Activities

“The impact determinations in Table 10-1 are for the combined impacts of construction and preconstruction. However, the impact determinations for NRC-regulated construction are the same for all resource areas except (insert names of applicable resource areas). For impact determinations that differ for the combined construction and preconstruction activities and the NRC-regulated activities, the impacts from the NRC-regulated activities are also identified in Table 10-1.”

- The following language will be included in EIS Section 10.6.2, Costs

“The external costs listed in Table 10-X summarize environmental impacts to resources that could result from construction, preconstruction, and operation of Unit (insert appropriate description). Because Table 10-X includes costs from preconstruction activities, it overestimates the costs of the NRC-authorized portion of the proposed action.”

- The following language will be included at the end of Section 10.6.3, Summary of Benefits and Costs, if warranted by the Staff's cost/benefit comparison:

“For the NRC proposed action (NRC-authorized construction and operation) the accrued benefits would also outweigh the costs of construction, preconstruction, and operation of Unit (insert appropriate description).”

## **Greenhouse Gases and Climate Change**

The Commission, in CLI-09-21, provided guidance to the staff regarding carbon dioxide and other greenhouse gases in its environmental reviews for major licensing actions under the National Environmental Policy Act (NEPA) of 1969, as amended. The Commission's guidance stated that the staff's analysis for reactor applications should evaluate emissions from the uranium fuel cycle as well as from construction and operation of the facility to be licensed.

The staff has developed a framework document to address greenhouse gas issues and climate change (ML100990204). Climate change is to be addressed in Chapter 2 as a changing affected environment under the discussion of climate; thereafter, it is to be considered in particular resource areas (air and water resources, ecological resources, and human health areas) as part of the cumulative impacts analysis (reflecting past, present and reasonably

foreseeable effects) in Chapter 7 for the proposed site and in Chapter 9 for the alternative sites. Carbon dioxide and other greenhouse gas emissions are to be considered as direct, indirect or related impacts on air quality (along with criteria pollutants) in Chapter 4 (Building Impacts), Chapter 5 (Operational Impacts), Chapter 6 (Fuel Cycle and Decommissioning), Chapter 7 (Cumulative Impacts at the Proposed Site), and Chapter 9 (Alternative Energy Sources and Cumulative Impacts at the Alternative Sites).

### **General Conformity Determination**

Conformity determinations are required when a department, agency or instrumentality of the Federal government engages in, supports in any way, or provides financial assistance for, licenses or permits, or approves any activity to ensure that the activity conforms to an applicable State Implementation Plan (SIP). For the upcoming EISs, the staff will determine if a conformity analysis is required, and if so, will coordinate with the appropriate regulatory agencies. If a proposed site for the construction of a reactor(s) is in an attainment area, a conformity determination need not be done.

The Office of New Reactors has issued detailed guidance (ML092150330) to the staff on performing General Conformity Determinations related to the attainment status of certain geographic areas with respect to air quality standards. The General Conformity Rule applies to all Federal actions that are taken in non-attainment or maintenance areas. The NRC staff has decided to include information on conformity determinations in EISs supporting the review of ESP and COL applications even though this is not required by NRC regulations. If a conformity determination is required, the public will be notified of the availability of the determination through a *Federal Register* notice and the EIS will contain a summary of the determination.

### **Environmental Justice**

The Office of New Reactors has guidance in place (NUREG 1555, March 2000, Sections 2.5.4, 4.4.3, and 5.8.3) regarding the assessment of potential disproportionately high and adverse impacts on minority and low-income populations within the 50 mile region surrounding a proposed new reactor site. These guidance documents are supplemented by the staff's guidance LIC-203, Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues (Rev 1, 2004) and the Commission's Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions (68FR62642) (August 2004). Based upon comments in the Commission's Memorandum and Order approving the issuance of the Early Site Permit (ESP) for the North Anna ESP site in Louisa County, Virginia (CLI- 07-27), the staff determined that the following clarification was needed.

Chapter 2 (Affected Environment) will describe how the staff will identify and describe the current state of the communities and people within the 50 mile region surrounding a proposed new reactor site.

- The chapter will define environmental justice terms and describe a baseline analysis methodology to identify potentially affected populations within the region in accordance with the Commission Policy Statement on Environmental Justice and staff guidance discussed above.

- The chapter will also discuss a series of additional considerations provided in LIC-203 for assessing the potential for disproportionately high and adverse impacts on any identified minority or low-income community.

Chapter 4 (Construction Impacts) will describe how the staff should consider the minority and low-income communities identified in Chapter 2 along with the analytical processes for determining socioeconomic impacts to identify potential impact categories (public services, education, demographics), pathways (soil, air, water), or unique practices (e.g., subsistence fishing, religious ceremonies, etc.) that could lead to environmental justice impacts.

Chapter 5 (Operations Impacts) will describe how the staff should consider the minority and low-income communities identified in Chapter 2 along with the analytical processes for determining socioeconomic impacts to identify potential impact categories (public services, education, demographics), pathways (soil, air, water), or unique practices that could lead to environmental justice impacts.

### **Need for Power**

The Office of New Reactors has guidance in place (NUREG 1555, Draft Revision 1 July 2007, Sections 8.0, 8.1, 8.2, 8.3, and 8.4,) for the assessment of the need for power consistent with the objectives of an applicant's COL. The staff's need for power review is further clarified by a series of Commission statements and opinions, the most important of which is the Commission's Denial of Petition for Rulemaking (SECY-02-0175). The staff determined that clarification of the guidance was warranted.

- Chapter 1 (Introduction) will include the Purpose and Need generally in terms of: (1) the type of power (baseload or not), (2) amount of power (Mwe), (3) location of the service area, and (4) expected date of delivery.
- Chapter 8 (Need For Power) will include the following:
  - 8.1: a discussion of the applicant, the service area, and the identification of an independent third party that has performed separate analysis of the potential need for power in the proposed service area and for the same time. ESRP Section 8.1 states the four criteria for the power analysis to be acceptable to the NRC. The four criteria state that the third party analysis is to be (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. The discussion in Section 8.1 will provide an evaluation of the compatibility of the third party analysis with these criteria and a determination of whether the analysis is sufficient. This third party analysis will form the comparative basis for the remainder of the need for power discussion;
  - 8.2: a discussion of the service area's future demand for electricity from the independent third party's report;
  - 8.3: a discussion of the service area's future supply of electricity from the independent third party's report;
  - 8.4: a comparison of the independent third party's future demand and supply, the net of which is compared to the capacity of the proposed project; and a

general conclusion as to the reasonableness of the applicant's need for power determination.

Chapter 10 will reference the Purpose and Need in Chapter 1 to support the description of the benefits that will be seen from the approval of the proposed action.

### **Cultural and Historic Resources**

Detailed guidance (ML100550730) has been issued to the staff for ESRP Sections 4.1.3 and 5.1.3, Historic Properties. Because the NRC conducts the required National Historic Preservation Act (NHPA), Section 106 consultation through its process for complying with the National Environmental Policy Act (NEPA), two conclusions about the impacts at the proposed site have to be made. One conclusion would satisfy the requirements of the NHPA and the other would satisfy the requirements of NEPA. The guidance supplements the ESRP with respect to (1) coordinating NHPA with the NEPA conclusion, (2) completing Section 106 consultation, (3) using reconnaissance-level information for alternative sites, (4) analyzing cumulative impacts for cultural and historic resources, and (5) protecting cultural and historic information. The staff is directed to implement the guidance in ML100550730 and disclose the resulting information when preparing EISs.

### **Cumulative Impacts**

The Office of New Reactors has issued detailed guidance (ML100990271) to the staff on cumulative impact analysis. This guidance supplements the ESRP direction to the staff for review of the cumulative impacts associated with the proposed project when considered in the context of other past, present, and reasonably foreseeable future actions. The scope of the cumulative analysis will include identification of the time frame of the analysis, the geographic area of interest, the baseline for the analysis and other actions that could contribute to the cumulative impact. The staff is directed to implement the guidance in ML100990271 and disclose the resulting information when preparing EISs.

### **References**

Interim Staff Guidance on the Definition of Construction and on Limited Work Authorizations was issued in the Federal Register (74 FR 8124) February 23, 2009

U.S. Army Corps of Engineers (Corps) and NRC updated Memorandum of Understanding (MOU) (ML082540354)

Supplemental Staff Guidance to NUREG 1555, "Environmental Standard Review Plan," (ESRP) for Alternatives Reviews (ML100840031)

U.S. Nuclear Regulatory Commission (NRC). *Duke Energy Carolinas, LLC* (Combined License Application for Williams States Lee III Nuclear Station, Units 1 and 2) and *Tennessee Valley Authority* (Bellefonte Nuclear Power Plant, Units 3 and 4), CLI-09-21, 70 NRC (Nov. 3, 2009) (ML093070690)

Greenhouse Gas and Climate Change Guidance (Memorandum ML100990204)

Office of New Reactors Guidance for Conducting Clean Air Act Conformity Determinations for New Reactor Licensing (ML092150330)

LIC-203, Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues (Rev. 1, 2004) (ML033550002)

Denial of Petition for Rulemaking (SECY-02-0175) (ML022200469)

Cultural and Historic Resource Guidance Memorandum (ML100550730)

Cumulative Impact Guidance Memorandum (ML100990271)