From: Nanette Gilles
To: Eddie Grant; Tom Mundy
Date: Fri, Jun 11, 2004 10:44 AM
Subject: DRAFT REQUESTS FOR ADDITIONAL INFORMATION

Please find attached a package of preliminary questions, in the form of draft requests for additional information (RAIs) for the Clinton ESP review. These questions pertain to the staff's review in the areas of meteorology, security, and quality assurance. Exelon may request a phone call to seek clarification on the questions before they are issued by letter. Please contact me to let me know if you wish to arrange such a call or if you have other questions.

Sincerely,

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Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
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Subject: DRAFT REQUESTS FOR ADDITIONAL INFORMATION
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From: Nanette Gilles

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Exelon Early Site Permit Application
Site Safety Analysis Report
Requests for Additional Information (RAI)

ESP Quality Assurance

RAI 17.1.1-1

Please describe the quality assurance measures used to authenticate and verify data retrieved from internet websites that supports information in the SSAR that would affect the design, construction, or operation of structures, systems, and components important to safety.

RAI 17.1.1-2

a.) Section 8 of Exelon's document AP-AA-1000, "Early Site Permit Project Quality Assurance Instructions," Revision 0, and Section 2.8 of CH2M HILL's "Project Quality Plan for Exelon Early Site Permit," Revision 4, state that the safety-related scope of the development of the ESP application would not involve the use of quality assurance measures for identification and control of materials, parts, or components. Please describe why these quality assurance measures were not applicable to the development of the ESP application. Alternatively, if these quality assurance measures were applicable to the ESP application, please describe the quality assurance measures used by Exelon and the primary contractor (CH2M HILL) for these activities.

b.) Section 9 of Exelon's document AP-AA-1000, "Early Site Permit Project Quality Assurance Instructions," Revision 0, and Section 2.9 of CH2M HILL's "Project Quality Plan for Exelon Early Site Permit," Revision 4, state that the safety-related scope of the development of the ESP application would not involve the use of quality assurance measures for control of special processes. Please describe why these quality assurance measures were not applicable to the development of the ESP application. Alternatively, if these quality assurance measures were applicable to the ESP application, please describe the quality assurance measures used by Exelon and the primary contractor (CH2M HILL) for these activities.

c.) Section 10 of Exelon's document AP-AA-1000, "Early Site Permit Project Quality Assurance Instructions," Revision 0, and Section 2.10 of CH2M HILL's "Project Quality Plan for Exelon Early Site Permit," Revision 4, state that the safety-related scope of the development of the ESP application would not involve the use of quality assurance measures for inspection. Please describe why these quality assurance measures were not applicable to the

development of the ESP application. Alternatively, if these quality assurance measures were applicable to the ESP application, please describe the quality assurance measures used by Exelon and the primary contractor (CH2M HILL) for these activities.

d.) Section 14 of Exelon's document AP-AA-1000, "Early Site Permit Project Quality Assurance Instructions," Revision 0, and Section 2.14 of CH2M HILL's "Project Quality Plan for Exelon Early Site Permit," Revision 4, state that the safety-related scope of the development of the ESP application would not involve the use of quality assurance measures for inspection, test, and operating status. Please describe why these quality assurance measures were not applicable to the development of the ESP application. Alternatively, if these quality assurance measures were applicable to the ESP application, please describe the quality assurance measures used by Exelon and the primary contractor (CH2M HILL) for these activities.

e.) Section 15 of Exelon's document AP-AA-1000, "Early Site Permit Project Quality Assurance Instructions," Revision 0, and Section 2.15 of CH2M HILL's "Project Quality Plan for Exelon Early Site Permit," Revision 4, state that the safety-related scope of the development of the ESP application would not involve the use of quality assurance measures for nonconforming materials parts, or components. Please describe why these quality assurance measures were not applicable to the development of the ESP application. Alternatively, if these quality assurance measures were applicable to the ESP application, please describe the quality assurance measures used by Exelon and the primary contractor (CH2M HILL) for these activities.

RAI 17.1.1-3

Please provide copies of the following documents that were reviewed during the NRC's special team inspection that was conducted from January 12-16, 2004, to review aspects of applicant and contractor quality control activities involved with the preparation of the application for the Clinton Early Site Permit:

a.) AP-AA-1000, "Early Site Permit Project Quality Assurance Instructions," Revision 0

b.) DEL-012-4, "Project Quality Plan for Exelon Early Site Permit," Revision 4, dated December 10, 2002

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Exelon Early Site Permit Application
SSAR Section 2.3, Meterology
Requests for Additional Information (RAI)

SSAR Section 2.3.1, Regional Climatology

RAI 2.3.1-1

SSAR Table 2.3-3 shows the number of tornadoes reported for DeWitt and the immediately adjacent surrounding counties for the period of record 1950 through 2002. Subsequent to the period of record reported in SSAR Table 2.3-3, there were 63 tornadoes reported in Central Illinois in 2003, 23 of which occurred in DeWitt and its surrounding counties. These 63 tornadoes rank 2003 second on the list for the most tornadoes in a year for central Illinois since 1950. Please update the tornado statistics provided in SSAR Section 2.3.1.2.2 and Tables 2.3-2 and 2.3-3 to include data from 2003.

RAI 2.3.1-2

Please provide a 3-second gust wind speed that represents a 100-year return period for the Clinton ESP site. This site characteristic value potentially represents a typical design parameter input for new reactor designs. Because the National Weather Service has phased out the measurement of fastest-mile wind speeds, SEI/ASCE 7-02 has redefined the basic wind as the peak (3-second) gust, a value which is now recorded and archived at most National Weather Service Stations.

RAI 2.3.1-3

SSAR Table 2.3-1 reports a peak gust wind speed of 69 mph as well as a fastest-mile wind speed of 75 mph for both Peoria and Springfield. Given the response characteristics of the instrumentation used, the peak gust measurement is associated with an averaging time of approximately 3 seconds whereas the fastest-mile wind speed measurement of 75 mph is associated with an averaging time of approximately 48 seconds. Typically, extreme wind values are expected to increase as the averaging time decreases; for example, the fastest 3-second-average wind speed would be expected to be higher than the fastest 48-second-average wind speed which would be expected to be higher than the fastest 5-minute-average wind speed. Consequently, please explain the apparent abnormality in SSAR Table 2.3-1 where the reported peak gust wind speeds are lower than the reported fastest-mile wind speeds.

RAI 2.3.1-4

There are inconsistences reported in the SSAR for the maximum monthly and maximum 24-hour snowfall value for Springfield. Section 2.3.1.2.3 states that the maximum monthly snowfall in the Springfield area is 24.4 inches whereas Table 2.3-1 reports a monthly maximum snowfall value of 22.7 inches. Likewise, Section 2.3.1.2.3 reports a maximum recorded 24-hour snowfall of 15.0 inches whereas Table 2.3-1 reports a 24-hour snowfall value of 10.9 inches. In addition, the Illinois State Climatologist Office's web site, http://www.sws.uiuc.edu/atmos/statecli/summary/118179.htm, reports a third value for the 1-day maximum snowfall: 17.0 inches (December 12, 1972) for the

period of record 1908 through 2001. Please affirm the appropriate maximum monthly and maximum 24-hour snowfall values for Springfield.

RAI 2.3.1-5

SSAR Section 2.3.1.2.3 defines an appropriate 100-year return period snowpack for the Clinton ESP site as 22 psf, based on the American Society of Civil Engineers (ASCE) Standard 7-98, “Minimum Design Loads for Buildings and Other Structures.” However, ASCE 7-98 Figure 7-1 shows a ground snow load of 20 psf for the Clinton ESP site which, by definition, has a 2% annual probability of being exceeded or a 50-year mean recurrence interval. According to ASCE 7-98 Section C7.3.3, the ratio of the 100-year to 50-year mean recurrence interval values is typically 1.22, which means that the 50-year return period snowpack value of 20 psf corresponds to a 100-year return period snowpack value of 24 psf. Consequently, please justify the 100-year return period snowpack value of 22 psf presented in the Clinton ESP SSAR.

RAI 2.3.1-6

The 79 psf value presented in SSAR Section 2.3.1.2.3 as the 48-hour winter Probable Maximum Precipitation (PMP) for the Clinton ESP site is based on the winter PMP data cited in the CPS USAR Section 2.3.1.2.3. The CPS USAR winter PMP value (15.2 inches of precipitable water) was derived from Hydrometeorological Report (HMR) No. 33 published in 1956 by the U.S. Weather Bureau. HMR No. 33 has been superseded and updated with the issuance of HMR No. 53 in 1980. Please update the 48-hour winter PMP presented in the SSAR with data from HMR No. 53.

RAI 2.3.1-7

Please provide the meteorological data to be used to evaluate the performance of a mechanical draft cooling tower ultimate heat sink with respect to: (1) maximum evaporation and drift loss; and (2) minimum water cooling. The period of record examined should be identified, and the bases and procedures used for selection of the critical meteorological data should be provided and justified. Section C.1 of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Power Plants," describes methods and approaches acceptable to the staff to ensure that a 30-day cooling supply is available and that design basis temperatures of safety-related equipment are not exceeded.

RAI 2.3.1-8

Please provide the ambient air temperature and humidity site characteristic values specified below. The bases for these values should also be provided. These site characteristic values represent typical design parameter information for a range of reactor designs.

a) Maximum ambient dry bulb temperatures (along with the concurrent wet bulb temperatures) that:
   - i) will be exceeded no more than 2.0% of the time annually.
   - ii) will be exceeded no more than 0.4% of the time annually.
   - iii) represents a 100-year return period.

b) Minimum ambient dry bulb temperature that:
   - i) will be exceeded no more than 1.0% of the time annually.
   - Ii) will be exceeded no more than 0.4% of the time annually.
   - iii) represents a 100-year return period.

c) Maximum ambient wet bulb temperature that:
   i) will be exceeded no more than 0.4% of the time annually.
   ii) represents a 100-year return period.

RAI 2.3.1-9

SSAR Section 2.3.1.2.2 states that the Clinton ESP site characteristic maximum tornado wind speed is 300 mph, based on SECY-93-087. The subject of the applicable section of SECY-93-087 is design-basis tornado for design of advanced light-water reactors (ALWRs). The staff does not agree that acceptance of a given design-basis tornado wind speed for design of ALWRs means that this speed is acceptable for all sites that might be the subject of an ESP. Site parameters are postulated for a design certification [10 CFR 52.47(a)(iii)] and are not required to bound every site on which an applicant might seek to construct a nuclear power plant of certified design.

SECY 93-087 states: "The staff expects that use of these criteria will not preclude siting the ALWR plant designs on most sites in the United States. However, should an actual site hazard exceed the design envelope in a certain area, the COL applicant would have the option of performing a site specific analysis to verify that the design is still acceptable for that site."

The documented basis for the tornado-related conclusions in SECY-93-087 is NUREG/CR-4661, which shows 10^{-7}/yr tornado wind speeds above 300 miles per hour (mph) in some parts of the United States. A letter dated March 25, 1988, from NRC to the ALWR Utility Steering Committee, Subject: ALWR Design Basis Tornado, provided the staff's interim position on design basis tornado wind speed on a site-specific basis. This letter also cited design-basis tornado wind speeds higher than 300 mph in some parts of the United States, including the Clinton ESP site.

ESP applicants are not required to use either Regulatory Guide 1.76 or the staff's interim position on design basis tornado wind speed, although they may do so since both are staff-accepted approaches. ESP applicants may use any design-basis tornado wind speeds that are appropriately justified. However, the staff does not believe that citing SECY-93-087 (or any document related to design certification) is adequate justification for use of 300 mph. In particular, Figure 30 of NUREG/CR-4461 shows a 10^{-7} probability of occurrence of wind speed of 327 mph for the Clinton ESP site. Please provide a safety justification for choosing 300 mph as the site characteristic maximum tornado wind speed for the Clinton ESP site.

SSAR Section 2.3.2, Local Meteorology

RAI 2.3.2-1

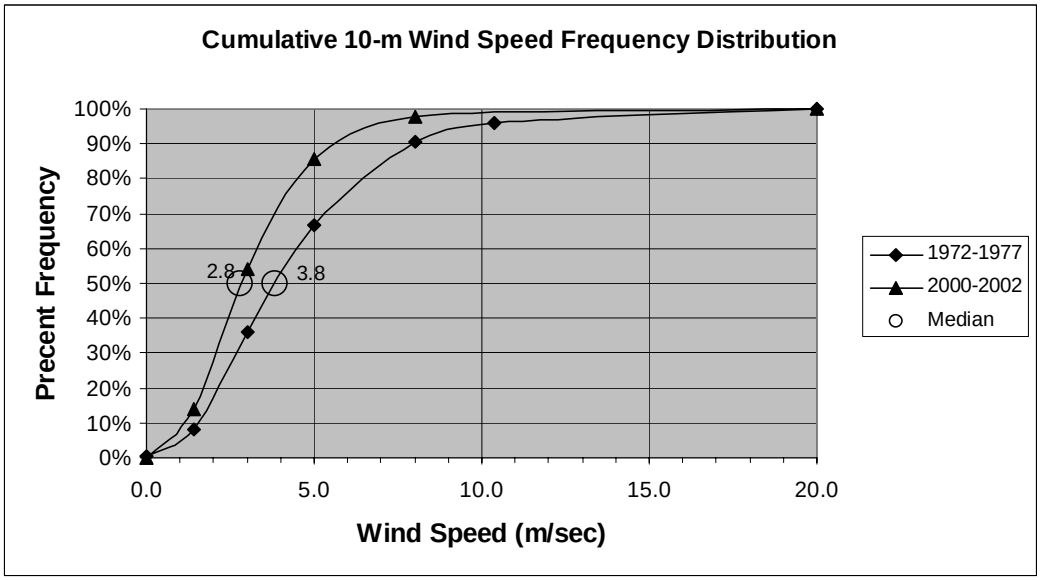
SSAR Sections 2.3.2.1.2 and 2.3.2.1.3 present temperature and humidity information from the onsite meteorological monitoring system for the period of record 1972-1977 and state that these data are believed to be representative of the site area. These data were collected prior to installation of Clinton Lake and the operation of the Clinton Power Station once-through cooling system. Please provide justification that these data remain representative of the Clinton ESP site, given that the site is now adjacent to a heated lake. Have any onsite data been analyzed since Clinton Power Station began operation to support this assumption?

RAI 2.3.2-2

SSAR Section 2.3.2.1.3.4 states that the average yearly precipitation for the Clinton ESP site is 25.47 inches, based on onsite data reported for the 1972-1977 period of record. The SSAR remarks that these data are believed to be representative of the site area and have been previously shown to be consistent with regional observations from Peoria and Springfield, Illinois when compared to long-term periods of record at those locations. However, SSAR Table 2.3-1 reports annual average precipitation totals of 34.89 inches and 33.78 inches for Peoria and Springfield, respectively. Likewise, the 1971-2000 normal annual precipitation reported for the Clinton cooperative weather station (located approximately 7 miles from the Clinton ESP site) is 39.86 inches. Please explain why the 1972-1977 onsite precipitation totals are only approximately 75% of the long-term precipitation totals reported for Peoria and Springfield.

RAI 2.3.2-3

The onsite 10-m wind speed frequency distributions presented in SSAR Table 2.3-8 show a general shift towards lower wind speeds in the more recent data. In particular, a plot of cumulative wind speed frequency distribution shows a median (50%) wind speed value of 2.8 m/sec for the 2000-2002 period of record as compared to a median wind speed value of 3.8 m/sec for the 1972-1977 period of record. Please explain what might have caused these differences in reported wind speed frequency distributions between these two periods of record.



RAI 2.3.2-4

The onsite (60m-10m delta-temperature) stability class frequency distributions presented in SSAR Table 2.3-37 show a high occurrence of unstable (stability class A, B, and C) conditions for 2000-2002 period of record as compared to 1972-1977 period of record (25.7% of the time versus 13.3% of the time, respectively). Please explain what might have caused these differences in reported stability class frequency distributions between these two periods of record.

RAI 2.3.2-5

Please identify the air quality characteristics of the site that would be design and operating bases for a nuclear plant or plants that might be constructed on the ESP site.

SSAR Section 2.3.3, On-site Meteorological Measurements Program

RAI 2.3.3-2

SSAR Section 2.3.3 states that the onsite meteorological monitoring system is compliant with applicable requirements of Revision 0 (February 1972) to Regulatory Guide 1.23, "Onsite Meteorological Programs," except for exceptions identified in the Clinton Power Station USAR. However, USAR Section 1.8 states that the CPS meteorological monitoring system meets the requirements of ANS 2.5-1984 with several exceptions. Please clarify the Clinton ESP meteorological monitoring program commitments to regulatory guidance documents and identify any exceptions to these documents.

RAI 2.3.3-3

SSAR Section 2.3.3 states that the existing Clinton Power Station onsite meteorological monitoring program will also be used as an operational system once the Clinton ESP facility becomes operational. The options being considered for the Clinton ESP facility normal heat sink include either 60-foot tall mechanical draft cooling towers or 550-foot tall natural draft cooling towers. Please describe the potential location of these cooling towers vis-a-vis the existing meteorological tower and the potential influence of these cooling towers on meteorological measurements.

RAI 2.3.3-4

Please explain why only 32 months of recent onsite data (January 2000-August 2002) have been used to generate the climatic data summaries and atmospheric dispersion analyses presented in the SSAR. Potential bias in these data exist due to the under representation of autumn and early winter months.

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Exelon Early Site Permit Application
SSAR Section 3.4.1.6, Security Plan
Requests for Additional Information (RAI)

RAI 3.4.1.6-1

Please provide scale drawings that depict:

- The existing protected area (PA) boundary
- The existing vehicle checkpoint
- Proposed PA boundary for the power block structures and safety related cooling towers
- The outer boundary of the owner controlled area (OCA)
- The shoreline of the lake within the OCA
- All roads and railroads that penetrate the OCA
- The proposed location of the intake structure
- Existing culverts (greater than 254 square inches in cross-section area) that extend from outside to inside the existing PA
- Existing or planned culverts (greater than 254 square inches in cross-section area) that extend from outside to inside either the area for power block structures and/or the area for safety related cooling towers, and
- Route 54 in relation to the OCA