

March 21, 2011

CCN 223580

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

NRC Project #0748

SUBJECT: Contract No. DE-AC07-051D14517 – Next Generation Nuclear Plant Project Submittal – (NRC Project #0748) – Voluntary Response to Nuclear Regulatory Commission Regulatory Issue Summary 2011-02

On February 2, 2011, the U.S. Nuclear Regulatory Commission (NRC) published Regulatory Issue Summary (RIS) 2011-02, "*Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs*" (Ref. a). The RIS seeks voluntary information regarding the content and schedule information for construction permit (CP), early site permit (ESP), standard design certification (DC), standard design approval (DA), or manufacturing license (ML) for a nuclear power plant that references a small modular reactor (SMR) design under the provisions of 10 CFR 50 or 10 CFR 52. For purposes of this RIS, SMRs are defined using the International Atomic Energy Agency definition of small- and medium-sized reactors with an electrical output of less than 700 megawatts.

This letter provides the voluntary response to NRC RIS 2011-02 for the Next Generation Nuclear Plant (NGNP) Project. The purpose of this response is to make the NRC staff aware of planned NGNP Project licensing activities that will support the future Combined License (COL) application approval for plant construction and operation. The information request contained in RIS 2011-02 is similar in nature to the information requested in RIS 2010-03 for which the Next Generation Nuclear Plant (NGNP) Project provided its response on March 25, 2010 (Ref. b). NRC acknowledgement of receipt of this response was provided on May 18, 2010 (Ref. c).

As stated in the Energy Policy Act of 2005, the NGNP Project will "consist of the research, development, design, construction, and operation of a prototype plant, including a nuclear reactor that is based on research and development activities supported by the Generation IV Nuclear Energy Systems Initiative." The NGNP will be a licensed commercial high temperature gas-cooled reactor (HTGR) plant capable of producing electricity and high temperature process heat for a variety of energy intensive industries.

A status update to the NGNP Licensing Strategy *A Report to Congress*, dated August 2008 (Ref. d), was provided in the April 2010 *Next Generation Nuclear Plant Report to Congress* (Ref. e). These references provide an overview of the licensing strategy to achieve the objectives set forth in the Energy Policy Act of 2005. The licensing strategy was jointly developed and submitted to Congress by the NRC and the Department of Energy (DOE). The NGNP Project team then developed a more detailed description of the project actions to be taken to implement the Licensing Strategy. This description is contained in the NGNP Licensing Plan (Ref. f), which was issued in June 2009. Implementation of this Plan is underway and forms the basis for much of this RIS response.

The DOE is implementing the NGNP Project in two phases. Phase 1 is comprised of pre-conceptual and conceptual design activities, ongoing research and development, and the further development of licensing requirements for the HTGR design. Based on these ongoing activities, the Secretary of Energy will review the status of Phase 1 activities and determine whether the NGNP Project should proceed to Phase 2. This determination is expected to occur in the fourth quarter of FY 2011. Under Phase 2, a public-private partnership will perform detailed design activities and submit a license application to the NRC for the construction and subsequent operation of a demonstration plant capable of producing hydrogen, electricity, and/or process heat.

Enclosure 1 provides the NGNP Project response entitled, Next Generation Nuclear Plant Project Submittal (NRC Project #0748), Voluntary Response to Nuclear Regulatory Commission, RIS 2011-02. Since the primary purpose of this RIS response is to aid NRC in establishing future resource requirements, the information provided in Enclosure 1 to this letter is based on the assumption that the Secretary will determine that the NGNP Project should proceed to Phase 2 and therefore submit a license application for NRC review and approval in support of plant construction and subsequent operation.

If you have any questions, please contact me at (208) 526-6063 or James Kinsey, Director of NGNP Regulatory Affairs, at (208) 569-6751.

Sincerely,



Greg Gibbs, Project Director
Next Generation Nuclear Plant Project

PJ:CN

Enclosure:

1. Next Generation Nuclear Plant Project Submittal (NRC Project #0748), Voluntary Response to Nuclear Regulatory Commission, RIS 2011-02.

- References:
- (a) NRC Regulatory Issue Summary 2011-02, *Licensing Submittal Information and Design Development Activities for Small Modular Reactor Designs*, February 2, 2011
 - (b) NRC Regulatory Issue Summary 2010-03, *Licensing Submittal Information for Small Modular Reactor Designs*, March 25, 2010
 - (c) Response to U.S. Nuclear Regulatory Commission's Regulatory Issue Summary 2010-03, "Licensing Submittal Information for Small Modular Reactor Designs," May 18, 2010
 - (d) Next Generation Nuclear Plant Licensing Strategy, *A Report to Congress*, August 2008
 - (e) Next Generation Nuclear Plant, *A Report to Congress*, April 2010
 - (f) *Next Generation Nuclear Plant Licensing Plan*, PLN-3202, June 26, 2009

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Enclosure 1
(CCN 223580)

Next Generation Nuclear Plant Project Submittal
(NRC Project #0748)
Voluntary Response to Nuclear Regulatory
Commission RIS 2011-02

NGNP's Voluntary Response to NRC RIS 2011-02

Design and Licensing Submittal Information

- 1. When (month and year) are applications planned for design-related applications and what NRC action will be requested (i.e., DC, DA, ML, or COL that does not reference a DC or DA)?**

RESPONSE: In 2005, the Energy Policy Act of 2005 formally authorized the Next Generation Nuclear Plant Project. Sections 641 through 645 of the Energy Policy Act of 2005 established expectations for research, development, design, construction, and operation of a prototype nuclear plant that would provide electricity and/or hydrogen.

The provisions of the Energy Policy Act of 2005 establish two distinct phases for the project. Phase 1 is the phase that covers selecting and validating the appropriate technology, carrying out enabling research, development and demonstration activities, determining whether it is appropriate to combine electricity generation and hydrogen production in a single prototype nuclear reactor and plant, and carrying out initial design activities for a demonstration reactor and plant, including development of design and safety analytical methods and studies.

Phase 2 is the phase that covers development of a final design for the demonstration nuclear reactor and plant, application for an NRC license to construct and operate the demonstration nuclear facility, and construction and operation for the demonstration nuclear reactor and its associated electricity, process heat, and/or hydrogen production facilities. Phase 2 is expected to be completed via the establishment of a public-private partnership with the Department of Energy (DOE).

The NGNP Licensing Strategy (Ref. c) provides the overview of the recommended licensing strategy for satisfying the Energy Policy Act of 2005. The Licensing Strategy was jointly developed by the Nuclear Regulatory Commission (NRC) and the DOE, and provides a high level strategy for the research and development, licensing, construction, and deployment of a high temperature gas-cooled reactor (HTGR) via the adaptation of existing light water reactor regulations. As written in the April 2010 *Report to Congress* (Ref. e), which provided an update to the August 2008 *NGNP Licensing Strategy Report to Congress* (Ref. d), the Combined License (COL) submittal schedule will be re-evaluated in conjunction with the conceptual design activities and will be revised as needed, reflecting the Secretarial decision associated with proceeding to Phase 2 of the project. The format and content of this application is expected to be consistent with COL applications that contain a final safety analysis report that describes the facility design, presents the design bases and the limits on its operation, and presents a safety analysis of the structures, systems, and components of the facility, as a whole.

The DOE will continue to maintain regular dialogue with the NRC regarding progress through the planned project phases and will communicate future submittal schedule adjustments, if any are identified.

- 2. Will the applicants be organized into DCWGs? If known, what is the membership of the DCWG and which party is the primary point of contact designated for each DCWG? Have protocols been developed to provide coordinated responses for RAIs with generic applicability to a design center?**

RESPONSE: The Idaho National Laboratory (INL), working under contract with the DOE, is the lead nuclear energy research and development laboratory for DOE in support of HTGR deployment. In this role, the NGNP Project team at INL has been, and continues to work closely with, the potential HTGR suppliers in areas related to conceptual design and priority HTGR licensing and policy issue resolution activities. The INL NGNP Project team is the primary point of contact for early development activities related to NRC licensing submittals that are applicable to the HTGR designs. In addition to this role, the NGNP Project team has engaged with other industry organizations and committees (e.g., American Nuclear Society (ANS), Nuclear Energy Institute (NEI), American Society of Mechanical Engineers (ASME), etc.) chartered to develop resolutions for selected regulatory policy issues that are generic to advanced reactor technologies, and are applicable to HTGR licensing. These coordination activities are expected to become the responsibility of the applicant, to be identified as a part of the Phase 2 public-private partnership summarized in the response to Item 1 above.

These activities are supportive of a Design-Centered Working Group (DCWG) concept and are intended to promote the "one issue, one review, one position," strategy advanced by NRC Regulatory Issue Summary (RIS) 2006-06, "New Reactor Standardization Needed to Support the Design-Centered Licensing Review Approach."

- 3. Which applicant that references the design will be designated as the reference COL applicant or, alternately, how will various applications (e.g., CP, DC, COL) be coordinated to achieve the desired design-centered licensing review approach?**

RESPONSE: The plant design for the NGNP project is being conducted in phases as stated in Item 1 above. NGNP is working to establish a public-private partnership and the COL applicant will be identified as this process progresses, and will be communicated to the NRC at that time. As noted in item 1, above, commencement of Phase 2 is dependent on a decision by the Secretary of Energy.

- 4. When (month and year) will CP, COL or ESP applications be submitted for review? In addition, what are the design, site location, and number of units at each site?**

RESPONSE: As summarized in Item 1 above, the COL submittal schedule as presented in the August 2008 *Report to Congress* (Ref. d) and updated in the April 2010 *Report to Congress* (Ref. e) will be re-evaluated in conjunction with the conceptual design activities and will be revised as needed, reflecting the Secretarial decision associated with proceeding to Phase 2 of the project. Detailed information associated with that application (site selection, etc.) will be established as a part of Phase 2, and will be communicated to the NRC staff at that time. The DOE does not currently plan for the submittal of an Early Site Permit (ESP) application associated with the demonstration plant site, although the ESP application option may be reconsidered by the COL applicant, once the applicant is identified. The plan, schedule, and scope for the ESP application would be communicated to the NRC staff at that time.

5. Are vendors or consultants assisting in the preparation of the application(s)? If so, please describe roles and responsibilities for the design and licensing activities.

RESPONSE: As described in the response to Item 2 above, the NGNP Project consists of the research, development, design, licensing, construction, and operation of a demonstration plant, including a nuclear reactor that is based on research and development (R&D) activities supported through the Office of Gas Cooled Reactor Technologies within the Department of Energy's Office of Nuclear Energy. Three (3) primary reactor suppliers that provide HTGR technology had been previously identified. They were: AREVA, General Atomics, and a team led by Westinghouse that included Pebble Bed Modular Reactor (PBMR) Pty Ltd from the Republic of South Africa. In addition, the NGNP Project team is engaged with various national laboratories, universities, and international advanced reactor communities in R&D activities that support the Generation IV reactor concepts. The NGNP Project team also subcontracts with Entergy for ongoing project support in order to bring the insights of a commercial nuclear plant owner-operator to project licensing activities.

On March 8, 2010, the DOE announced the participants in the development of the reactor conceptual design reports and planning work which are necessary to complete Phase 1 of the project. The teams selected were led by Westinghouse and General Atomics. Subsequently in 2010, the Westinghouse team withdrew from conceptual design activities.

The General Atomics conceptual design report has been completed, and included input from General Atomics (San Diego), General Dynamics Electric Boat Division, URS Washington Division, Korea Atomic Energy Research Institute, and Fuji Electric Systems.

Going forward, INL has entered into negotiations with Entergy to be the "surrogate" licensee for the first-of-a-kind plant, leveraging its licensing experience to support the NGNP Project until a partnership has been established and the actual applicant named. This support is contingent on the development of associated contractual arrangements, NGNP Project funding, and the availability of adequate design detail to support the development and submittal of the license application.

As Phase 2 is established, the NGNP Project will update the NRC Staff regarding the final makeup of the team developing the license application, along with associated roles and responsibilities.

Design, Testing, and Application Preparation

- 6. What is the current status of the development of the plant design (i.e., conceptual, preliminary, or finalizing)? Has the applicant established a schedule for completing the design? If so, please describe the schedule.**

RESPONSE: Conceptual design work, as summarized in Item 5 above, was completed in late 2010. The additional design work necessary to develop and complete the COL application will be completed in Phase 2 of the project. Phase 2 covers development of a final design for the demonstration nuclear reactor and plant, application for an NRC license to construct and operate the demonstration nuclear reactor, plant construction, and operation for the demonstration nuclear reactor and its associated electricity, process heat, and/or hydrogen production facilities. The additional design work necessary to support the COL application will be completed subsequent to the establishment of the public-private partnership described above.

- 7. What is the applicant's current status (i.e., planning, in progress, or complete) for the qualification of fuel and other major systems and components? Has the applicant established a schedule for completing the qualification testing? If so, please describe the schedule.**

RESPONSE: As stated in Item 1 above, qualification of major systems and components is an integral activity that has been in progress since the early stages of the NGNP Project. Numerous research, development, and qualification activities are underway in support of HTGR design, licensing, and plant operation. These activities are intended to focus on many of the qualification issues that are also addressed in the recently approved High Temperature Gas-Cooled Reactor (HTGR) NRC Research Plan (March, 2010), which describes NRC activities related to the development of confirmatory tools to be used during the HTGR license application review process.

As an example, the fuel qualification program for the NGNP Project has been ongoing for a number of years, and details of the schedule and plan are discussed in the INL's Advanced Gas Reactor (AGR) Fuel Development and Qualification Program Plan, a copy of the latest version of which was provided to the NRC in December 2010. The objective of the AGR Fuel Development and Qualification Program is to qualify TRISO (TRI-ISOtropic)-coated particle fuel for use in HTGRs. Both pebble bed and prismatic block reactors employ TRISO fuel particles, which consist of a microsphere (i.e., kernel) of nuclear material encapsulated by multiple layers of pyrocarbon and a silicon carbide layer.

There are five elements in the AGR Fuel Development and Qualification Program: fuel manufacture, fuel irradiation, post-irradiation examination (PIE) and safety testing, fuel performance modeling, and fission product transport and source term. An NGNP Project licensing white paper covering the proposed fuel qualification process (INL/EXT-10-18610) was submitted for NRC review on July 21, 2010. In addition, an NGNP Project white paper covering mechanistic source terms (INL/EXT-10-17997) was submitted for NRC review on July 21, 2010.

- 8. What is the applicant's status (i.e., planning, in progress, or complete) in developing computer codes and models to perform design and licensing analyses? Has the applicant defined principal design criteria, licensing basis events, and other fundamental design/licensing relationships? Has the applicant established a schedule for completing the design and licensing analyses? If so, please describe the schedule.**

RESPONSE: The NGNP Project is engaged in the design, construction, and operation of thermal-fluidic testing facilities to validate system and computational fluid dynamics software used for high temperature safety analysis and design. See the response to Item 9 below for additional details. A white paper covering the topic of licensing basis event selection (INL/EXT-10-19521) was submitted for NRC review on September 16, 2010. In addition, an NGNP Project licensing white paper was planned for future development describing analytical code verification and validation (V&V) program. Upon further consideration, this topic was determined to be more appropriately addressed in a topical report to be prepared by the COL applicant. The schedule for completing the design and licensing analyses will be developed and communicated to the NRC following the Secretarial decision to proceed to Phase 2 of the project.

- 9. What is the applicant's status in designing, constructing, and using thermal-fluidic testing facilities and in using such tests to validate computer models? Has the applicant established a schedule for the construction of testing facilities? If so, please describe the schedule. Has the applicant established a schedule for completing the thermal-fluidic testing? If so, please describe the schedule.**

RESPONSE: The NGNP Project is engaged in the design, construction, and operation of thermal fluidic testing facilities. The main objective of this work is the validation of system and computational fluid dynamics software used for high temperature reactor safety analysis and design. These facilities and experiments cover a range of separate effects and integral phenomena that have been identified in the NGNP Phenomena Identification and Ranking Table (PIRT) as having a significant impact on one or more safety or performance parameters and possessing a high degree of uncertainty. The PIRT process provides an expert panel assessment of safety-relevant phenomena and identifies R&D needs. The detailed PIRT exercises have been documented in NUREG/CR-6844 (July 2004) and NUREG/CR-6944 (March 2008). These data are further analyzed and reduced to an actionable level in the "Next Generation Nuclear Plant Gap Analysis Report" (ORNL/TM-2007/228, July 2008).

The two major integral test facilities are: 1) the High Temperature Test Facility (HTTF) being constructed at Oregon State University, and 2) the Natural Circulation Shutdown Test Facility (NSTF) being refurbished at Argonne National Laboratory. The HTTF will be used to simulate heat and thermal fluid transfer within and out of a prototypical high temperature reactor vessel under steady state and severe loss of forced cooling conditions. The NSTF will be used to simulate and study vessel cooling and ex-core heat transfer phenomena. Data from these facilities will be used to validate developed computer models. The HTTF facility is expected to be available in FY-2013 and the NSTF facility availability is to be determined. The NGNP Project is working closely with the NRC on both HTTF and the NSTF to ensure that these facilities will support the licensing of HTGRs.

10. What is the applicant's status in defining system and component suppliers (including fuel), manufacturing processes, and other major factors that could influence design decisions? Has the applicant established a schedule for identifying suppliers and key contractors? If so, please describe the schedule.

RESPONSE: The NGNP Project has implemented the Technology Readiness Level (TRL) process, which is a tool used by National Aeronautics and Space Administration (NASA) and Department of Defense projects as part of the overall project risk management program. The reactor design suppliers have identified those Structures, Systems, and Components (SSCs) that have development needs with the potential to impact the NGNP Project. Plans and preliminary schedules to progress through the TRL maturity levels for those SSCs have been developed and documented as Technology Development Roadmaps (TDRMs) and associated Test Plans. The TDRMs and Test Plans, along with various technology development studies, also performed by the suppliers, such as for heat transport system and power conversion system alternatives, provide a preliminary overview of the current international status of large equipment suppliers, such as circulators and steam generators, and forging vendors to support the NGNP. This process may be utilized during Phase 2 for making down-selections and selecting components, suppliers, and key contractors. At this phase of the project, the primary challenges to the deployment of an HTGR in the desired time frames appear to be qualification of fuel and graphite, and delivery of high temperature heat exchangers. The qualification of the fuel is being addressed via the INL's AGR Fuel Development and Qualification Program. The qualification of graphite is being addressed via the INL's graphite program. Challenges associated with other major system and components, such as for large forgings and circulators, should be manageable if procurement activities are initiated during the Preliminary Design phase.

The NGNP Project is continuing to support the development and codifying of high temperature materials and manufacturing processes, such as diffusion bonding for heat exchangers. This work is being performed in conjunction with, and within the overall goals of, the ASME as identified in their draft "Roadmap for the Development of ASME Code Rules for High Temperature Gas Reactors." In support of this project activity, NGNP submitted for NRC review a white paper entitled "NGNP High Temperature Materials" (INL/EXT-09-17187) on June 25, 2010. The scope of this paper is to review the existing policies, regulations, and guidance associated with acceptance of materials for nuclear reactor applications and to assess the bases for their implementation in the system components of the HTGR.

Reactor fuel manufacturing and supply/acquisition issues are addressed by various elements of the Advanced Gas Reactor Fuel Development and Qualification Program, the latest version of which was provided to the NRC staff in December 2010.

11. What is the applicant's status in the development and implementation of a quality assurance program?

RESPONSE: As part of the early licensing phase of the NGNP Project, PDD-172, Revision 0, "Next Generation Nuclear Project Quality Assurance Program Description," (QAPD) was submitted for initial NRC review and feedback on August 10, 2010. The QAPD is the top-level policy document that establishes the Quality Assurance (QA) policy and assigns major functional responsibilities for R&D, design, ESP/COL application/construction/pre-operation, and/or operation activities, and decommissioning conducted by or for the NGNP Project. The QAPD describes methods and establishes QA and administrative control requirements that meet 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." The QAPD is based on the requirements and recommendations of ASME NQA-1-2008, 1a-2009, Parts I, II, and with specific reference to selected Part III and Part IV sections. It is also consistent with the additions and modifications to the regulatory positions included in NRC Regulatory Guide 1.28, Revision 4, "Quality Assurance Criteria (Design and Construction)", and with Nuclear Energy Institute's NEI 11-XX, "Nuclear Generation Quality Assurance Program Description (NG-QAPD)." The NRC has endorsed ASME NQA-1-2008, 1a-2009, as an acceptable method for conformance to 10 CFR 50, Appendix B criteria.

NRC feedback on the NGNP QAPD was received by letter dated November 10, 2010. This feedback was intended to facilitate resolution of a small set of initially identified issues. Based on this NRC feedback on the NGNP QAPD, NGNP plans to submit a revised QAPD for formal NRC review and approval in the spring of 2011. This schedule is in concert with the current schedule for the NEI to complete its template for implementation of the QA requirements of ASME NQA-1, 1a-2009. The revised QAPD will include disposition of the previous NRC comments.

12. What is the applicant's status in the development of probabilistic risk assessment models needed to support applications (e.g., needed for Chapter 19 of safety analysis reports or needed to support risk-informed licensing approaches)? What are the applicants' plans for using the probabilistic risk assessment models in the development of the design?

RESPONSE: Information on the use of PRA in support of NGNP design and licensing effort will be provided in a white paper scheduled to be submitted to the NRC staff during the third quarter of FY-2011.

13. What is the applicant's status in the development, construction, and use of a control room simulator?

RESPONSE: Reactor vendor(s) selected to participate in Phase 2 of the project would be expected to design and construct a control room simulator for operator training and qualification purposes, consistent with the guidance provided by RG 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations," Revision 3, October 2001. RG 1.149 provides guidance for compliance with 10 CFR 55.46 and 55.59 for operator training and qualification, and it endorses ANSI/ANS-3.5-1998, "Nuclear Power Plant Simulators for Use in Operator Training and Examination." Currently, NGNP design is not at a sufficient stage of maturity to support simulator design and construction.

- 14. What are the applicant's current staffing levels (e.g., full time equivalent staff) for the design and testing of the reactor design? Does the applicant have plans to increase staffing? If so, please describe future staffing plans.**

RESPONSE: See the response to Items 1 and 5 above for current overall project status. Future staffing levels will be better defined when the decision is made to move into Phase 2, and the associated planning for Phase 2 is completed.

- 15. What are the applicant's current and future plans for using contractors to support plant design and testing (e.g., how many part-time and how many full-time contractors does or will the applicant employ)?**

RESPONSE: See the responses to Items 1 and 5 above.

White papers and technical/topical reports

- 16. What are the applicant's plans on the submittal of white papers or technical/topical reports related to the features of their design or the resolution of policy or technical issues? Has the applicant established a schedule for submitting such reports? If so, please describe the schedule.**

RESPONSE: To provide additional detail regarding project plans for implementing the NGNP licensing strategy described in Item 1 above, the INL issued the NGNP Licensing Plan in June, 2009 (Reference d). The plan identifies those highest priority licensing topics that were deemed necessary for early interaction with the NRC staff to identify and resolve policy, regulatory, and key technical issues related to the NGNP Project. The Plan also describes a process to be used for addressing those topics with the NRC, via a series of licensing white paper submittals, NRC public meetings, and NRC disposition of the identified issues. NGNP white papers previously submitted to the NRC and scheduled for near term submittal to the NRC for review are as follows:

<u>White Paper</u>	<u>Submittal Date</u>	<u>NRC Public Meeting</u>
Defense-In-Depth (INL/EXT-09-17139)	December 9, 2009	March 8, 2010
High Temperature Materials (INL/EXT-09-17187)	June 25, 2010	September 1, 2010
Fuel Qualification (INL/EXT-10-18610*) *Revised from 17686	July 21, 2010	September 2, 2010
Mechanistic Source Terms (INL/EXT-10-17997)	July 21, 2010	September 2, 2010
Licensing Structure for Multi- Module Facilities (INL/EXT-10-18178)	August 10, 2010	None
Licensing Basis Event Selection (INL/EXT-10-19521)	September 16, 2010	November 2, 2010
Structures, Systems, and Components Safety Classification (INL/EXT-10-19509)	September 21, 2010	November 2, 2010
Determining the Appropriate Emergency Planning Zone Size and Emergency Planning Attributes for an HTGR (INL/MIS-10-19799)	October 28, 2010	January 26, 2011
Probabilistic Risk Assessment	3 rd Quarter, FY-2011	To be determined
NGNP Safety Basis	4 th Quarter, FY-2011	To be determined
Tritium Release Limits	4 th Quarter, FY-2011	To be determined

Topical reports, which will form a portion of the COL application, are expected to be submitted to the NRC by the license applicant during Phase 2 of the project.

- 17. For ESP applicants, will the applicant be seeking approval of either "proposed major features of the emergency plans" in accordance with 10 CFR 52.17(b)(2)(i), or "proposed complete and integrated emergency plans" in accordance with 10 CFR 52.17(b)(2)(ii)?**

RESPONSE: See the response to Item 4 above.

Manufacturing Licenses

- 18. Describe possible interest in the use of the provisions in Subpart F, "Manufacturing Licenses," of 10 CFR 52 instead of, or in combination with, other licensing approaches (e.g., DC or DA).**

RESPONSE: Construction of the NNGP prototype facility does not anticipate utilizing the provisions of 10 CFR 52, Subpart F, "Manufacturing Licenses," for the manufacture of a nuclear power reactor instead of or in combination with other licensing approaches. However, to facilitate plant construction, off-site and/or on-site modular fabrication of some plant components may occur for which a manufacturing license is not required. Plant components subject to such modular fabrication shall meet all applicable regulatory requirements and codes and standards and any applicable conditions of the COL. Since a reactor vendor and license applicant have not been designated at this time, no specifics regarding modular fabrication are available.

- 19. Describe the expected combination of manufacturing, fabrication, and site construction that results in a completed operational nuclear power plant. For example, what systems, structures, and components are being fabricated and delivered; which of these are being assembled on site; and which are being constructed on site?**

RESPONSE: See response to item 18.

- 20. Describe the desired scope of a possible manufacturing license and what design or licensing process would address the remainder of the proposed nuclear power plant. For example, would the manufacturing license address an essentially complete plant or would it be limited to the primary coolant system basically consisting of the integral reactor vessel and internals?**

RESPONSE: See response to item 18.