AREVA

Proj 733

May 24, 2006
NRC:06:023

Document Control Desk
ATTN: Mr. David B. Matthews
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Proposed Approach for Resolution of Design Process and Verification Issues for the U.S. EPR

Ref.: 1. Letter, Ronnie L. Gardner (Framatome ANP) to Document Control Desk (NRC), NRC:06:004, February 3, 2006.

Dear Mr. Matthews:

On February 23, AREVA NP met with the NRC staff to discuss the design process and design timeline for the U.S. EPR. In that meeting, AREVA NP presented a proposed approach for addressing design process and verification issues during the design certification review. The purpose of this letter is to outline the approach and the areas in which it will be applied, provide process examples of how issues would be closed, and request NRC concurrence that this approach will allow resolution of these issues. The goal of the approach is to resolve as many issues as possible generically via the design certification and thus minimize so-called "open items" left to be addressed in each COL application referencing the design.

As noted in the meeting, the U.S. EPR is uniquely positioned for this approach because of the availability of the first-of-a-kind engineering for the reference plant (Olkiluoto-3 in Finland) prior to the submittal of the design certification application and because the detailed engineering for the U.S. EPR will continue uninterrupted as the basic design is completed. Therefore, there is an opportunity for closure of some items which in previous design certifications may have required the use of Design Acceptance Criteria (DAC) to support design certification rulemaking.

The areas in which the approach will be applied include detailed piping design and analysis, instrumentation and controls (I&C), and human factors engineering (HFE). The process for closure in each of these areas is discussed next.

D077

AREVA NP INC.
An AREVA and Siemens company

3315 Old Forest Road, P.O. Box 10935 Lynchburg, VA 24506-0935
Tel.: 434 832 3000 - Fax: 434 832 3840 - www.areva.com

Detailed Piping Design and Analysis

AREVA NP will submit a "U.S. EPR Piping Analysis and Pipe Support Design Guide" to the NRC in September 2006. (This report was identified in Reference 1, Attachment 2, under the topic "Piping DAC.") The report will describe the following areas of safety-related pipe and pipe support design and analysis:

1) Codes and Standards
2) Piping Analysis Methods
3) Piping Modeling Techniques
4) Piping Stress Analysis Criteria
5) Pipe Support Design Criteria

This type of information is consistent with what has been submitted in previous design certification applications in specific subsections of Tier 2, Chapter 3. AREVA NP plans to request NRC review and approval of this material in advance of the application for design certification. Meanwhile, AREVA NP will continue with detailed piping and pipe support analysis according to the timeline shown in Enclosure 1. AREVA NP notes the availability of the following information to support NRC verification of correct implementation of the methods and criteria specified in the report:

1) At the time of the design certification application (December 2007)
    a. Leak-before-break (LBB) analysis for the reactor coolant system (RCS), surge line, and main steam line
    b. Class 1 primary stress analysis of the RCS main coolant loop and the surge line
    c. Class 2 and 3 piping analysis for one train of main steam, feedwater, emergency feedwater, safety injection, component cooling water, and steam generator blowdown.
2) One year following application for design certification (December 2008)
    a. For Class 2 and 3 piping:
        i. 20 to 25% of piping (>=2" inches) will be qualified per ASME code requirements
        ii. Support/restraint designs completed
        iii. Break locations identified with initial whip/jet restraints located and designed.
3) During the remainder of the NRC review of the design certification application
    a. Transient and fatigue analysis for the RCS piping (including the surge line)
    b. Stratification analysis for the surge line
    c. Structural, stress, and fatigue analysis for the Class 1 attached piping and supports
    d. Stress analysis of supports for Class 1 attached piping and supports
    e. Design and analysis of Class 2 and 3 piping and supports (on-going to support construction schedule for the U.S. EPR)

AREVA NP believes sufficient detailed design products will be available to demonstrate correct implementation of the piping analysis methods and modeling techniques. Therefore, AREVA NP proposes that the NRC plan to use this information to support verification of correct implementation of the methods and modeling techniques. If the NRC does verify appropriate implementation, then AREVA NP will consider those areas of review resolved and will not include those in the U.S. EPR design acceptance criteria.

I&C and HFE

The specifics of the proposed approach for each of the areas of I&C and HFE are very similar and thus will be discussed together. The approach for these two areas relies primarily on addressing process and program elements in a phased manner, as follows:

1) Submittal of a Software Program Topical Report in December 2006 addressing BTP-14. (This report was proposed to the NRC during the U.S. EPR Pre-Application Meeting held on April 27, 2006.)
2) Submittal of a Human Factors Program Topical Report in January 2007 addressing the implementation of NUREG-0711 for the U.S. EPR. (This report was identified in Reference 1, Attachment 2, under the topic "Human Factors.")
3) Submittal of a Digital Protection System Design Report for the U.S. EPR in March 2007 addressing the system-level design process, and the hardware and software design implementation program for the development of the U.S. EPR protection system. (This report was identified in Reference 1, Attachment 2.)
4) Development of implementing procedures and guidelines
5) Implementation of processes and procedures in four phases
    a. Phase 1: Conceptual design
    b. Phase 2: Basic design
    c. Phase 3: Detailed design
    d. Phase 4: Manufacturing, Testing, and Installation

The timeline for the U.S. EPR I&C design is shown in Enclosure 2. The timeline for the U.S. EPR HFE design is shown in Enclosure 3.

AREVA NP believes sufficient design products will be available prior the NRC's completion of the design certification review to demonstrate correct implementation of the I&C and HFE design processes and the respective implementing procedures and guidelines. Therefore, AREVA NP proposes that the NRC plan to use this information to support verification of correct implementation. If the NRC does verify appropriate implementation, then AREVA NP will consider those areas of review resolved and will not include those in the U.S. EPR design acceptance criteria.

AREVA NP believes the proposed approach described herein supports the NRC objective of resolving as much material as possible generically during a design certification review and thus minimizing reliance on design acceptance criteria to support design certification rulemaking. AREVA NP requests NRC concurrence that this approach will allow resolution of the items above in the areas of piping design and analysis, I&C, and human factors engineering.

AREVA NP looks forward to continued interactions with the NRC to ensure an efficient and successful pre-application review. Ms. Sandra M. Sloan, Regulatory Affairs Manager for New Plants Deployment, remains the point of contact with the NRC for the pre-application review. She may be reached by telephone at 434-832-2369 or by e-mail at sandra.sloan@areva.com.

Sincerely,

Ronnie L. Gardner

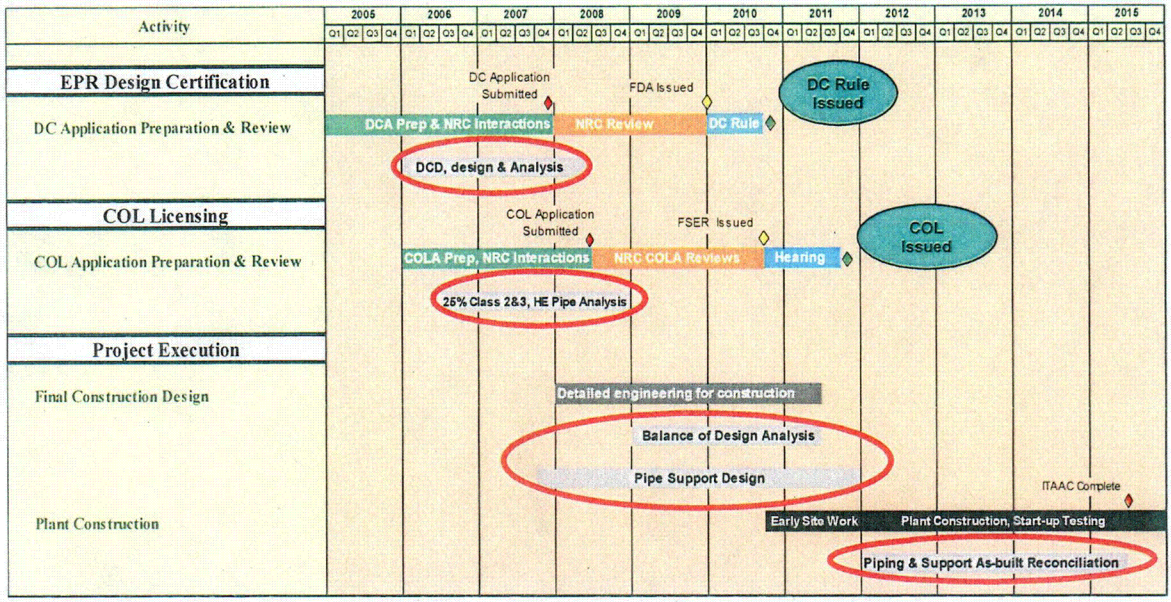
Ronnie L. Gardner, Manager
Site Operations and Regulatory Affairs
AREVA NP

Enclosures

cc: J. F. Williams
L. J. Burkhart
Project 733

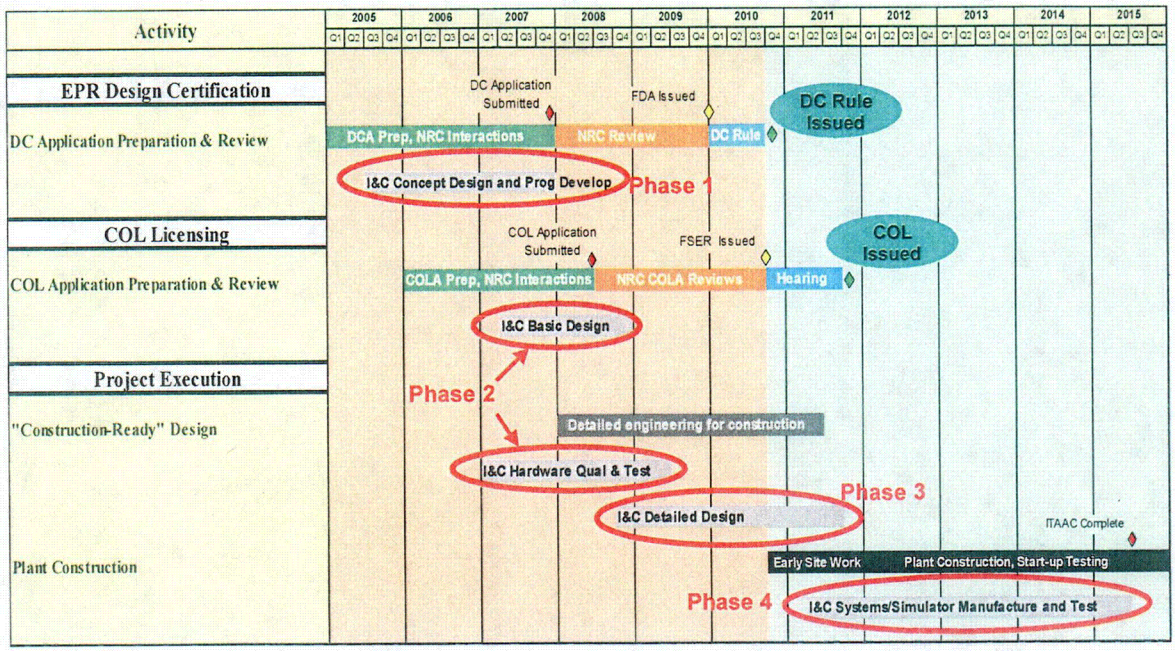
Enclosure 1

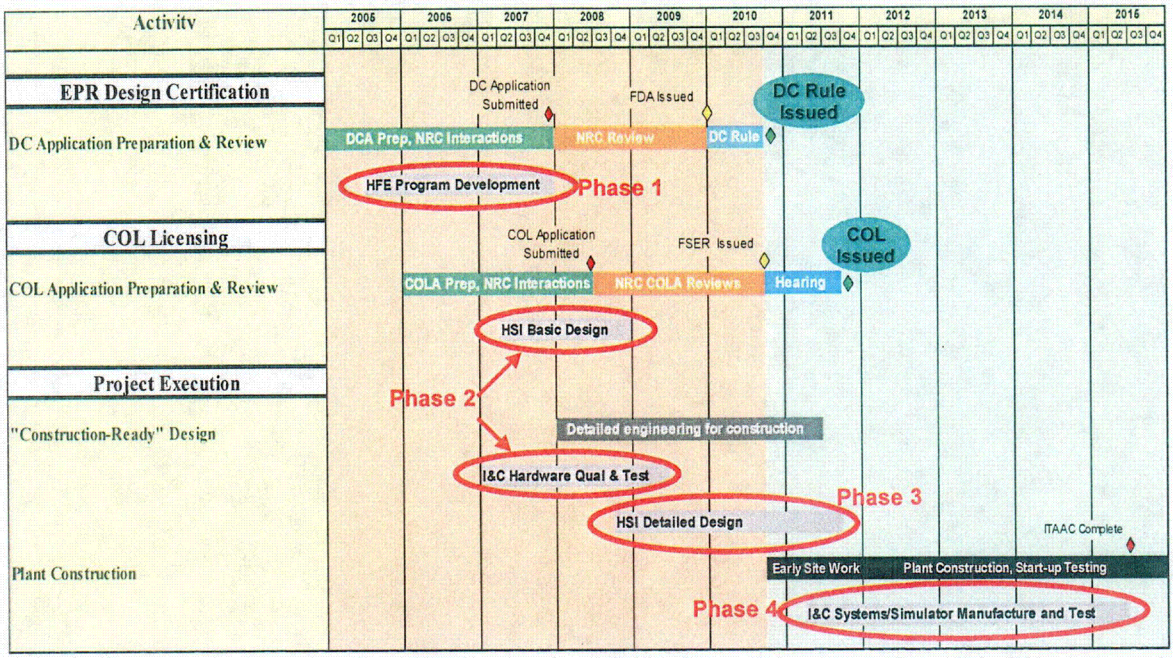
Timeline for Piping Design and Analysis



Enclosure 2

Timeline for I&C Design



Enclosure 3

Timeline for HFE Design