CORE

September 14, 2007

Patrick Madden,
Deputy Director, Infrastructure Contract Plg & Mgmt
Regulatory Improvement Programs, USNRC
11555 Rockville Pike, MS O-12E13
Rockville, MD 20852

New Plant Design Controls: Next Steps

Ref: Database Control Process to Speed New Plant Design Reviews, August to Madden August 31, 2007
Purpose: Assure the Office of New Reactors (design/construction) has the most effective infrastructure & tools available to manage new plant construction. Assure NRC plant schedule controls clearly show likely sources of project delays well in advance, for planning purposes.

Dear Mr. Madden:

NRC new nuclear construction safety design reviews must link ITAACs with fundamental design attributes like safety categories, procurement specifications, start-up procedures, and scheduled maintenance – a host of requirements. Anticipated design changes complicate tracking. Improving design construction accuracy, quality and speed will help assure timely construction completion, verification and startup. Comprehensive plant startup design bases will simplify construction closeout for new operating licenses.

Plant design-construction progress could make documentation verification impractical. As it is, Westinghouse/Shaw Stone Webster's AP-1000 – the first new plant order – has *at least* two years engineering development without our design basis tracking controls. Although a working database drops development risk, we must still:

1. Map high-level and site-specific design criteria data structures, using the AP-1000 design following the 10CFR52 COL process,.
2. Build a critical attribute content shell schema linking source documents
3. Validate the process schema developing four finished plant design systems

NSSS/AE use document-based process controls – regardless of their cost, complexity, error rates or other negative consequences. Long-term relational method benefits go far beyond present construction management controls. They include substantial improvements in long-term plant design basis management, design document automation and other development efficiencies. Streamlining design construction reviews benefits not only construction schedules; it leaves an integrated design basis as the final design basis legacy. This step-improves design basis safety controls for the life of the plant.

As the next step, we should learn your methodology, map process design requirements, and plan the conceptual project. This work would take 5 days (10 man days) in Rockville. Identifying critical attributes to track reduces controls overhead. Structured development greatly reduces the risk of ineffective work tracking. We have a narrow availability opportunity. Our choice is working strategically with NRC rather than another project. Jointly working on design basis controls would not only serve NRC present needs, but provide the best support for nuclear safety performance long-term.

Sincerely,

J.K. August,
President, CORE, Inc.
303-425-7408/303-507-5272 cell

Att: **Major Project Elements/ Major Steps/ CORE Conflict of Interests Statement**
c/ David Matthews, Director, Regulatory Improvement Programs
William Borchardt, Director, Office of New Reactors
Thomas Bergman, Deputy Director, Division of New Reactor Licensing, NRO

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Major Project Elements

1. Identify critical performance requirements. Cover requirements bases once, and only once – relationally, so the review process is very efficient.

2. Map data structures to high-level critical design attributes, system safety function requirements; function block diagrams, & train rules

   - Support NRC's COL design-construct process; facilitate point checking, update and status review.
   - Identify MEL, P&ID, vender technical materials, and construction/testing requirements structurally to develop and maintain the design basis critical attributes for review (ITAACs).
   - Map AP-1000 DCD document structure to application data structures
   - Design tracking reviews, status and other outstanding database design items.[1]
   - Provide functionally-equivalent application reports, formatted similar to ML050750282, the current AP-1000 DCD.

3. Locate critical attribute shell source document hot link content.

   - Incorporate key design attributes, relationally linking fundamental attributes
   - Provide comprehensive equipment models (templates)
   - Associate comprehensive equipment models (templates), which model each SSC

4. Plan pilot

   - Link data via workstations
   - Track all authorized design basis changes.

5. Functionally replicate the regulatory framework pilot scope with relational database controls.

6. Review outputs products and reports

7. Approve the rough approval and update framework.

<u>In summary</u>, the ability to easily trace the thread "O-ring to Solenoid valve to RCP system functional design basis," for example, provides relational links that make plant design safety function traceability, audit and design basis maintenance efforts very simple.

[1] Action Items, Open Items, to be delivered…

Major Steps

(Repetitive by System, Bulleted •)

(AP-1000)
Establish Regulatory Framework
(Probabilistic Risk Assessment (PRA) Basis Input)
AP-1000 DCD Design Control Document
AP-1000 Framework: Reference Regulatory Documents & OE Generic Communications
(High-level)
- SFBD System Function Block Diagram
- Process & Instrument Drawings (P&ID)
- Master Equipment List (MEL)
- Inspections Tests and Acceptance Criteria (ITAACs)

(Detail level)
- Systems Structures & Components (SSC)
- Final Design
- Construction
- "As Built" Final Design
- "As Built" Walkdowns Physical Plant Validation & Verification
- Check ITAACs
- Test
- Accept/Resolve

Approve Regulatory Framework Development
Regulatory Framework Complete

(See also 11 x17 storyboard, *Relational Database Speeds Up New Plant Design*)

CORE Conflict of Interests Statement: CORE has no Conflict of Interests with NRC Licensee Work, as of September 14, 2007
(ref: Subpart 2009.5 Organizational Conflicts of Interest)

CORE has no current NRC conflicts according per your policy referenced above. At some future data other CORE proposals may lead to work creating a conflict of interests. If that occurs we are willing to contractually offer NRC right of refusal based upon a signed contract. We believe it is in the country's interest to assure new construction projects develop without foreseeable delays. To that end we believe NRC could waive conflict of interest, should those concerns arise at some time in the future.

CORE has examined NRC's policy on conflict of interest. We have a unique window. We do not have any current contracts with NRC licensees. We do, however, have proposals on the table, and must execute work as opportunities present. No CORE employees nor subcontractors have ever worked for NRC as employees nor taken any engagements that would create a conflict in the work area/

Time is of the essence. CORE and NRC opportunities are short. We can't maintain our freedom of other work for long, and thus the importance of timely follow-up. We also believe Chairman Klein's or Director Borchardt's notes suggest that time is of the essence for action:

> *Given this meeting's focus on future technology, I am not going to address the tremendous challenges the NRC is confronting with regard to the review, licensing, and inspection of new light water reactors in the United States. Instead, I would like to share my perspectives on some of the challenges associated with the renewed global interest in advanced nuclear technology (Klein Global 2007: Advanced Fuel Cycles and Systems, Boise, ID, September 10, 2007)*

> *Anticipated new flood of license applications reactors.*

> *"There are a lot of challenges for new construction and a lot of challenges for the NRC."," said Bill Borchardt, director of the Nuclear Regulatory Commission's Office of New Reactors. "We have never had to do this many reviews at one time in parallel with an office that has only existed for less than 12 months," Borchardt said Thursday at the NRC's reactor training center in Chattanooga. "Nobody thinks this is going to be easy."*