

The JUOTC Project (DCPP/SONGS) Phase 2 Study

November 26, 2012



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Bechtel's Commitment

- We are committed to work in a partnership with PG&E and SCE to perform nuclear services with the following objectives:
 - Achieving the highest level of safety and quality
 - Meeting and exceeding customer's project goals
 - Providing engineering certainty
 - Providing cost and schedule certainty
- Keys to success
 - Single point of contact and accountability
 - Experienced personnel
 - Recognized technical expertise
 - Strong project management
 - Proven project controls processes
 - Sound execution approach (predictability and certainty)
 - Corporate commitment

INSTITUTE OF NUCLEAR POWER OPERATIONS PRINCIPLES FOR A STRONG NUCLEAR SAFETY CULTURE

- **EVERYONE IS PERSONALLY RESPONSIBLE FOR NUCLEAR SAFETY**
Responsibility and authority for nuclear safety are well defined and clearly understood.
- **LEADERS DEMONSTRATE COMMITMENT TO SAFETY**
Executive and senior managers are the leading advocates of nuclear safety and demonstrate their commitment in both word and action.
- **TRUST PERMEATES THE ORGANIZATION**
A high level of trust is established in the organization, fostered, in part, through timely and accurate communication.
- **DECISION-MAKING REFLECTS SAFETY FIRST**
Personnel are systematic and rigorous in making decisions that support safe, reliable plant operation.
- **NUCLEAR TECHNOLOGY IS RECOGNIZED AS SPECIAL AND UNIQUE**
The special characteristics of nuclear technology are taken into account in all decisions and actions.
- **A QUESTIONING ATTITUDE IS CULTIVATED**
Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions.
- **ORGANIZATIONAL LEARNING IS EMBRACED**
Operating experience is highly valued, and the capacity to learn from experience is well developed.
- **NUCLEAR SAFETY UNDERGOES CONSTANT EXAMINATION**
Oversight is used to strengthen safety and improve performance.



Phase 2 Scope

- Based on Bechtel's Phase 1 Interim Reports, the Review Committee and the Utilities (PG&E / SCE) have selected the following technologies for Phase 2 evaluation:
 - Closed-Cycle Cooling Systems – five cooling variations, including hybrids
 - Make-up source
 - Desalination
 - Fresh / grey water from outside of plant boundaries (up to 20 miles from each plant site)
 - Inshore Mechanical (active) Intake Fine Mesh Screening
 - Offshore Modular Wedgewire or Similar Exclusion Screening Systems



Phase 2 Scope (cont'd.)

- Complete further technical evaluation of the selected technologies (see flow chart, page 10)
- Complete Criterion #10 evaluation – Nuclear Specific Assessment
 - Licensing (50.59), seismic, operability, transient analysis, nuclear fuel (accident), single failure, hydraulic design, PRA, and I&C
- Develop interim reports, if any, of technologies that “screen out” as a result of Criterion # 10 evaluation
- Complete Criterion # 11 – Detailed Cost and Schedule of technologies that “screen in” Criterion # 10 evaluation
 - Provide separate costs for:
 - (a) Planning, construction, and installation (i.e. EPC costs)
 - (b) Downtime (i.e. lost generation and replacement costs)

[Note – The Utilities have advised Bechtel that they will provide downtime costs for their respective plants]
 - Provide Level II EPC schedules
- Submit Final Phase 2 Report for each plant site



Phase 2 Approach

- Per agreement with the Utilities, Bechtel will prepare Preliminary Estimates (AACE Class 3) for all technologies that pass Criterion # 10 evaluation
- Bechtel will prepare preliminary designs to the extent necessary to support development of quantities, estimates, and schedules
- Bechtel will use its Estimating Process and Integration Control (EPIC) system to develop the Class 3 estimates (see flow chart, page 11)
 - Direct costs – materials, equipment, labor hours and dollars, subcontracts and freight
 - Distributable costs – labor and material, subcontracts, construction equipment
 - Indirect costs – field non-manual, startup, and material
 - Engineering/Other Home Office costs – engineering and other home office labor and material
 - Other costs – taxes, duties, insurance, escalation, contingency, etc



Phase 2 Approach (cont'd.)

- Typical sources of input for estimate components:
 - Direct material and equipments – quantified by engineering; costed via bid, quote, and/or database information
 - Direct labor – quantified via installation unit rates and crew-ups; costed using current labor bulletins and other information (crew mix, task mix, overtime percentage)
 - Subcontracts – significant subcontracts are specified by engineering and construction; costed via budget quotes with appropriate allowances
 - Distributable material – quantities built up; costed by item/category
 - Distributable labor – quantified by crew-ups per task; costed per “direct labor” above
 - Indirect material – quantified by position and per hour; costed based on expected expenses (business travels, relocation , etc)
 - Personnel costs (FNM, Eng/OHO labor) – quantified by staffing plans; costed on billing rates
 - Other costs – various methodologies



Phase 2 Approach (cont'd.)

- Typical engineering deliverables (preliminary) for estimate development:
 - Common to all Disciplines
 - Demolition scope or Removal / Relocation of Equipment
 - Safety related, Non-safety related, Augmented quality
 - Tie-ins to existing SSCs
 - Architectural
 - Coatings
 - Waterproofing
 - Siding and Roofing
 - Personnel / Equipment Hatches
 - Interior finishes
 - Civil
 - Earthwork
 - Foundations
 - Building Size Volume
 - Concrete
 - Formwork
 - Tunnel



Phase 2 Approach (cont'd.)

- Underground Large Piping and Ducts
- Rebar
- Embeds
- Metal Deck
- Structural Steel
- Miscellaneous Steel
- Electrical
 - Single Lines
 - Electrical Equipment
 - Circuit Counts
 - Average Conduit Length / Circuit
 - Average Circuit Length
 - Average Terminations / Circuit
 - Cable Tray Length by size, type, and material specifications
 - Duct bank Length, Size, and Configurations
 - Motor Control Centers count and number of stacks
 - Layout of switchyard / substation
 - Unscheduled Commodities (lighting, communication, heat tracing, etc)



Phase 2 Approach (cont'd.)

- I&C
 - Control Logics
 - List of Control Valves (if any) by type, size, and duty
 - I / O Count
 - Type of control system with list of equipment

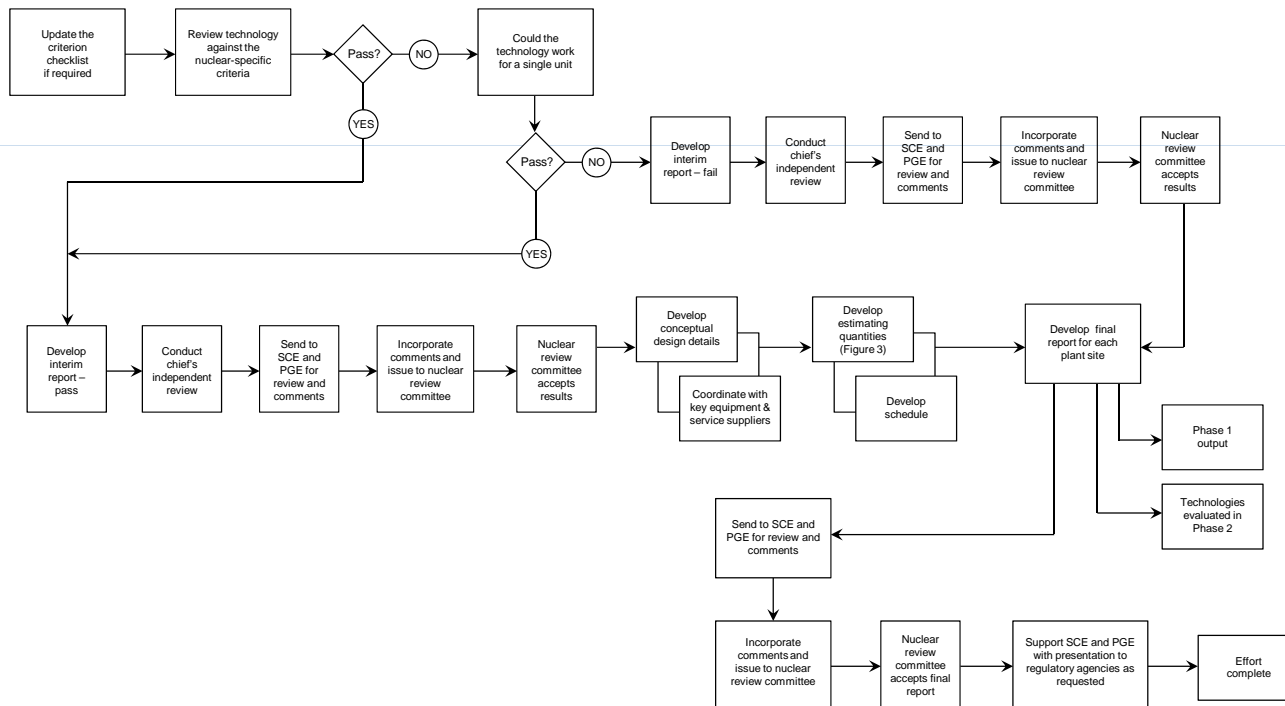
- Mechanical
 - P&IDs
 - Component sizing calculations (e.g., pumps, cooling towers, screens, desalination units, etc)
 - Hydraulic Analysis / Design
 - Equipment List (including capacities, HP, sizes, etc)
 - Water Source confirmation

- Plant Design / Piping
 - General Arrangements
 - Pipe List of Quantities (L/B and S/B)
 - Valve List (size, MOV or other, pipe class)
 - Specialty List (strainers, other inline components)



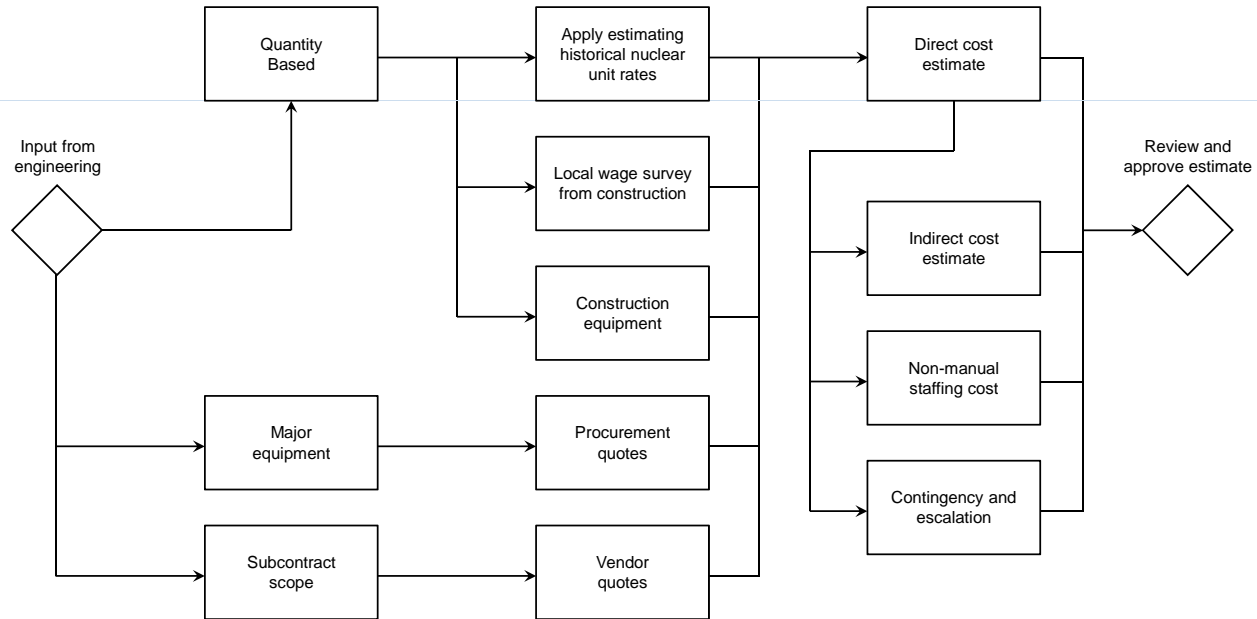
Phase 2 Approach (cont'd.)

Phase 2 Review Process for Each Technology



Phase 2 Approach (cont'd.)

EPIC PROCESS



Phase 2 Level 1 Schedule



Phase 2 STWP (typical)



Phase 2 Scope / Approach

QUESTIONS / COMMENTS?

