

NGNP Conceptual Design Studies Work Plan

November 20, 2008

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BEA Contract No. 000 75310, Release 3



Work Plan Approval

A handwritten signature in black ink, appearing to read 'J. Stringer', with a horizontal line extending from the end of the signature.

Joe Stringer, AREVA Project Manager



Record of Revisions

Revision	Date	Page/Sections Changed	Brief Description
000	November 2008	N/A	Initial Release



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1 Project Overview

This work plan is formulated to provide engineering services for the conceptual design activities for NGNP with high efficiency electricity production and process heat applications including a hydrogen production facility. Previously, AREVA has supported the Pre-Conceptual Design of a prismatic fuel high temperature, gas-cooled reactor. This work continues that effort as the program moves into the conceptual design phase.

AREVA has the overall project responsibility. Other key technical competencies needed for full execution of this and follow-on phases of the NGNP including final design, construction and operations work have been assembled within the AREVA NGNP Team. The specific project organization for the work scope addressed in this work plan is outlined in Section 5.1, Project Organization.

1.1 AREVA Reference Design

For the purposes of this work scope, the reference design is a prismatic fuel design with an outlet temperature of 750 °C and a direct steam cycle power conversion system. This design concept will be the basis for all of the work performed under this work plan. Any deviations from this design will be documented in revisions to this work plan.

2 Work Plan

The initial work covered under this work plan includes the following:

- 2.1 FY2009 Programmatic Support by Vendors [WBS C.Q.10.20.10.PE.R1]
- 2.2 Design Data Needs (DDNs) Reconciliation against PIRTs [WBS C.Q.10.20.10.PE.R2]

The following describes the work associated with these individual tasks.

Any additional tasks authorized under Release 3 will result in revisions to this work plan.

2.1 FY2009 Programmatic Support by Vendors

The NGNP Project has entered the Conceptual Design phase; however, there remains a significant level of technology down-selection and technical risk reduction areas to be addressed prior to commencing focused design in support of licensing applications. AREVA will support the NGNP project through “level of effort” activities related to technical risk reduction and management. This will include providing review and input on specific programmatic activities to aid in development of the overall approach, with the ultimate goal of minimizing licensing risks for the NGNP project. The specific task descriptions are provided in the following subsections.



These tasks are “level of effort” tasks for which AREVA will provide support up to the budgeted amount. The deliverables for the Programmatic Support tasks are limited by the effort it takes to develop them.

2.1.1 R&D Scope Validation

AREVA will support a detailed review of the overall NNGP Research & Development (R&D) Program’s scope. This review will occur after the FY08 Component Test Facility (CTF) effort to develop and validate a set of Technology Development Roadmaps (TDRM) is completed in December, 2008. The review is anticipated to occur in a multi-day workshop style meeting in January, 2009, at a location still to be determined. The vendor will be responsible for providing select personnel to travel to the meeting, participate in the validation review sessions, and provide a trip summary report containing any additional recommendations.

This task will include preparing for the meeting by reviewing applicable materials, attending and participating in the meeting and providing a trip report and any additional recommendations.

Although the actual schedule will be negotiated later, the meetings are expected to occur in January 2009, with some preparation for the meetings occurring in December. The following milestones are set assuming a mid-January meeting schedule.

Milestones:

- Notification of Schedule from BEA 1/5/09 (*at least 2 weeks prior to actual schedule date*)
- Participation in Meetings 1/19-22/09 (*TBV*)
- Letter Report to BEA 2/20/09 (*TBV*)

Deliverables: Letter Report

2.1.2 Technical Readiness Level (TRL) Update Support

NGNP Engineering will sponsor an effort to validate the TRL levels for critical SSCs submitted by the vendors as part of the FY08 CTF work scope. Validation of TRLs will be performed by an independent board assembled by NNGP Engineering. AREVA will support these meetings as necessary to help update TRLs based on the board’s review and also address any emergent TRLs for newly identified critical SSCs. The deliverable(s) for this task will be a letter report containing updated TRL forms. However, this is a “level of effort” task. AREVA will provide support up to the level budgeted. The deliverable is limited by the effort it takes to complete.

At the time of proposal, this task was planned to complete by December 18, 2008. However, BEA requested that AREVA assumes 25% carry-over of effort into CY09. It now appears that this task will not begin before CY09.



This task will include preparing for the TRL discussions by reviewing applicable materials, attending/participating in the board review, addressing emergent TRLs for newly identified critical Structures, Systems, and Components (SSC) and providing a letter report containing any updated TRL forms.

Although the actual schedule will be negotiated later, the meetings are expected to occur in February 2009, with some preparation for the meetings occurring in December. The following milestones are set assuming an early February meeting schedule.

Milestones:

- Notification of Schedule from BEA 1/19/09 (*at least 2 weeks prior to actual schedule date*)
- Participation in Review 2/3/09 (TBV)
- Letter Report to BEA 3/9/09 (TBV)

Deliverables: Letter Report

2.1.3 Review of NNGP Risk Management Program

NGNP Engineering will develop an integrated Risk Management Program with the goals of focusing R&D work scope, attacking technical risk reduction in a methodical approach, and developing defensible answers to all technical Licensing issues. The NNGP Risk Management Program will be based the concepts of the TDRMs and also Technology Readiness Levels (TRL) used by NASA and DOD projects. BEA anticipates completing a draft of the NNGP Risk Management Program in spring 2009.

AREVA will provide a review and comment on the NNGP Risk Management Program, with specific focus on applicability to critical SSCs inherent to the AREVA's reference design. This will include providing comments and recommendations via a letter report issued at a date to be negotiated later. At the time of proposal, this task was planned to complete in the Spring of 2009.

This task will include preparing for the program review by reviewing applicable materials, reviewing the NNGP Risk Management Program, and providing comments and recommendations via a letter report.

Although the actual schedule will be negotiated later, the meetings are expected to occur in the Spring of 2009, with some preparation for the meetings occurring prior to that. The following milestones are set assuming an early April meeting schedule.

Milestones:

- Notification of Schedule from BEA 3/2/09 (*at least 2 weeks prior to actual schedule date*)
- Letter Report to BEA 5/1/09 (TBV)



Deliverables: Letter Report

2.2 Design Data Needs (DDNs) Reconciliation Against PIRTs

AREVA will perform a detailed reconciliation of the DDNs against the PIRTs to ensure each issue raised in the PIRTs is addressed by one or more DDNs. If any issues raised in the PIRTs are not adequately addressed by a DDN, DDNs will be revised and/or developed as part of this work scope. This reconciliation will be documented in a final report that contains a mapping of DDNs to each issue identified in the PIRTs.

Due the recent change in the recommended reference design, this task will first involve revising the existing AREVA DDN list to account for the new design. Once this is complete, AREVA will review the PIRTs for the NGNP Design (NUREG/CR-6944) and the TRISO Coated Particle Fuel (NUREG/CR-6844) and determine which of the PIRTs are: 1) covered by the revised DDNs, 2) not covered by the revised DDNs, or 3) are not applicable to the reference design. Using this information, AREVA will revised the DDNs to cover all of the applicable PIRT items and create a matrix to show how the PIRTs are covered by the DDNs. This will be documented in report provided to BEA by January 30, 2009. The report will include the revised DDNs and the matrix versus the PIRTs.

Milestones:

- | | |
|-----------------------------------------------|----------|
| • Kickoff Meeting | 12/3/08 |
| • Revised DDNs versus new design concept | 12/12/08 |
| • Categorized PIRTs versus new design concept | 1/8/09 |
| • Revised DDNs versus categorized PIRTs | 1/16/09 |
| • Draft report to BEA | 1/21/09 |
| • 90% Review | 1/27/09 |
| • Final report to BEA | 1/30/09 |

Deliverables: Report containing the revised DDNs and the matrix versus the PIRTs.

3 Project Controls Plan

AREVA is committed to implementing sound project management practices to ensure that they meet deliverable dates within budget. This includes tracking schedule and budget against established milestones. The following subsections address the schedule and budget for this work plan.

3.1 Schedule

The following figure shows the activity-based schedule for this work plan. This schedule provides the basis for monthly reporting of earned value calculations. Also included is a table of milestones for this work plan.

The activities shown in the schedule are listed below:

- FY2009 Programmatic Support by Vendors Activities
 - Participate in R&D Scope Validation Meetings
 - Update TRL forms
 - Review of NGNP Risk Management Program
 - Provide Project Management

- Design Data Needs (DDNs) Reconciliation Against PIRTs Activities
 - Perform detailed reconciliation of DDNs against the PIRTs
 - Provide Project Management

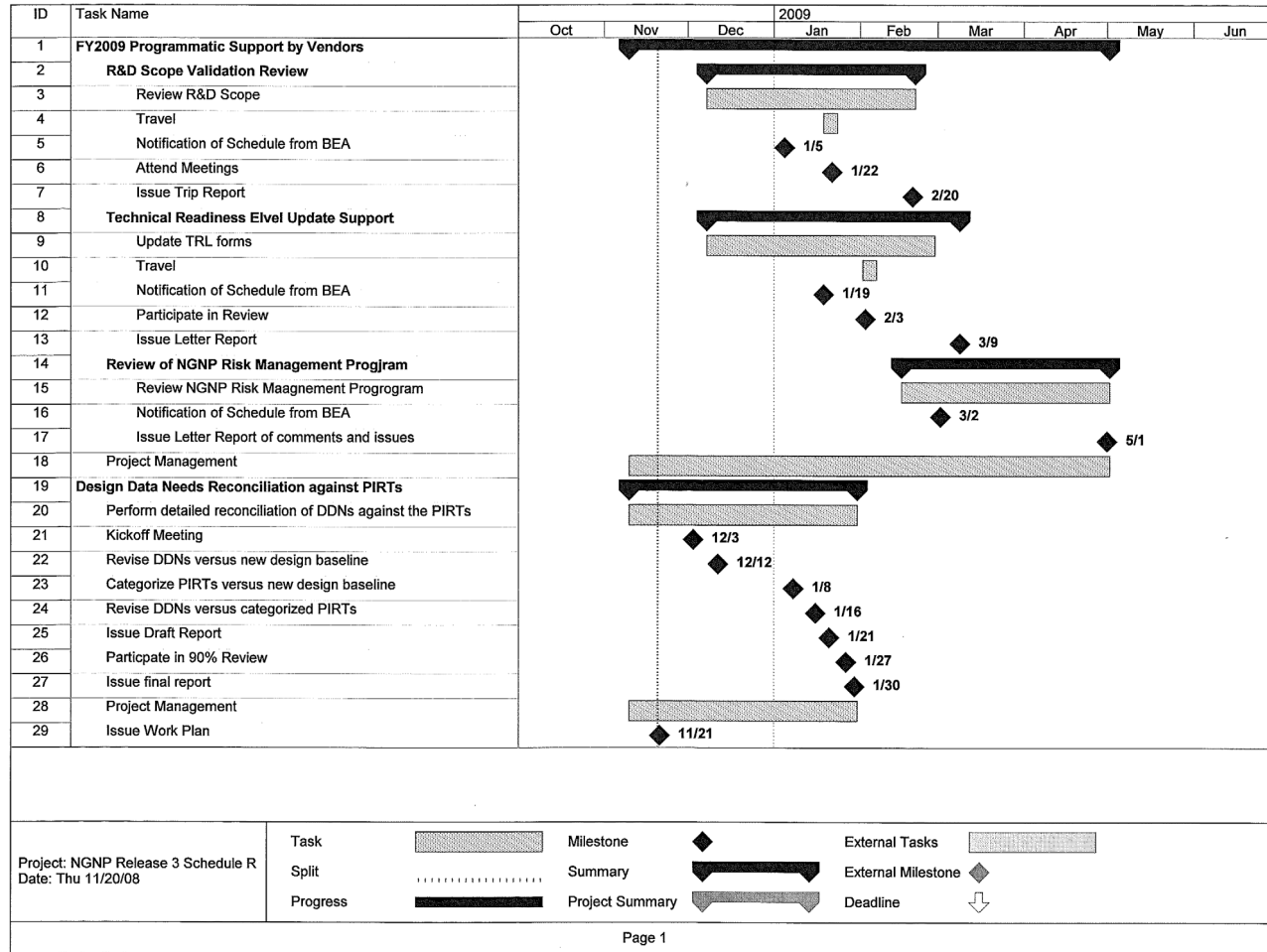


Figure 1. Activity-based Schedule for SOW-6636, Rev. 0



Table 1. Milestone List for SOW-6636, Rev. 0

Milestone	Due Date
<i>R&D Scope Validation</i>	
Notification of Schedule from BEA	1/5/09 (TBV)*
Participation in Meetings	1/19-22/09 (TBV)
Letter Report to BEA#	2/20/09 (TBV)
<i>Technical Readiness Level (TRL) Update Support</i>	
Notification of Schedule from BEA	1/19/09 (TBV)*
Participation in Review	2/3/09 (TBV)
Letter Report to BEA	3/9/09 (TBV)
<i>Review of NGNP Risk Management Program</i>	
Notification of Schedule from BEA	3/2/09 (TBV)*
Letter Report to BEA	5/1/09 (TBV)
<i>Design Data Needs (DDNs) Reconciliation Against PIRTs</i>	
Kickoff Meeting	12/3/08
Revised DDNs versus new design concept	12/12/08
Categorized PIRTs versus new design concept	1/8/09
Revised DDNs versus categorized PIRTs	1/16/09
Draft report to BEA	1/21/09
90% Review	1/27/09
Final report to BEA	1/30/09

* For Programmatic Support tasks, BEA will provide at least 2 weeks notice prior to actual schedule date

Deliverable



3.2 Budget

The following table shows project setup along with budgets by task for this work plan. This table provides the basis for monthly reporting of earned value calculations.

Table 2. Task Budgets for SOW-6636, Rev. 0

Task/Subtask Name	Budget
<i>FY2009 Programmatic Support by Vendors</i>	\$193,586
R&D Scope Validation Review	\$38,549
Participate in Meeting	\$32,549
Issue Trip Report	
Travel R&D Scope Validation Review	\$6,000
Technical Readiness Level Update Support	\$67,687
Update TRL forms	\$62,187
Issue Letter Report	
Travel TRL Updates	\$5,500
Review of NGNP Risk Management Program	\$65,085
Review NGNP Risk Management Program	\$65,085
Issue Letter Report of comments and issues	
Project Management for Programmatic Support	\$22,265
<i>Design Data Needs Reconciliation against PIRTs</i>	\$85,274
Perform detailed reconciliation of DDNs against the PIRTs	\$73,668
Issue final report	
Travel for DDN/PIRT	\$4,500
Project Management for DDN/PIRT	\$7,106
G&A on Travel	\$1,089
Fee	\$18,400
Total	\$23,989



4 Project Quality Plan

Reference 2 identifies ASME-NQA-1-2000, Quality Assurance Requirements for Nuclear Facility Applications, as the applicable Quality Assurance standard for the NNGP. Where required, AREVA implements and maintains a quality system in accordance with ASME-NQA-1-2000. However, the requirements of this standard only apply when invoked via individual work task. Work tasks that are governed by NQA-1 requirements will contain the statement “NQA-1 applicable Work Task” at the beginning of the work task description. This release (Reference 1) does not call-out NQA-1 requirements for the work to be performed under this work plan. Therefore, no quality plan is required for these tasks.

As a quality nuclear engineering services provider, AREVA and its subcontractors will perform work under the applicable quality management systems. This will included following the applicable procedures governing non-safety, non-quality-affecting work.

5 Resource Plan

5.1 Project Organization

AREVA intends to employ several AREVA affiliates as well as two subcontractors. AREVA Federal Services, LLC (AFS) and AREVA NP Inc. (ANP) will provide the bulk of the work. However, AREVA NP SAS (SAS), Mitsubishi Heavy Industries (MHI) and the Washington Group International (WGI) will probably also be subcontracted to support some of these tasks. The following table lists the overall project organization.

Table 3. Project Organization for SOW-6636, Rev. 0

Role	Resource	Responsibility
Project Management	Joe Stringer (primary) Bill Anderson (assistant)	Project reporting, project controls, earned value management
Program Manager	Finis Southworth	Technical/strategic direction
Project Engineer	Lew Lommers	Technical lead
Contract Administration	Dean Lindeman	Contract reporting, invoicing
Quality Assurance	Jerry Ebner	Auditing, quality control



5.2 Training Plan

This work will be performed by AREVA and their subcontractors. Personnel working on this project will be trained to their applicable procedures as governed by their quality management system. No project-specific training is necessary for this work scope.

6 Communications Plan

AREVA recognizes that proper communication is essential to successful projects. This involves establishing clear chains of communications. To this end, AREVA recognizes the following formal communication lines and contacts (see next page).

Contract Administration Points of Contact:

BEA Contact	Greg K. Anderson Battelle Energy Alliance, LLC Mailstop 3890 2424 Fremont Ave. P.O. Box 1625 Idaho Falls, ID 83415-3890 Gregory.Anderson@inl.gov
AREVA Contact	L. Dean Lindeman 3315 Old Forest Rd. PO Box 10935 Lynchburg, VA 24506 Dean.Lindeman@areva.com

Technical Points of Contact:

BEA Contact	Doug Vandel 208-526-9382 Doug.Vandel@inl.gov
AREVA Contact	Joe Stringer 434-805-2711 Joe.Stringer@areva.com

For this work scope, AREVA will implement status reviews, formal monthly status reporting, and design reviews, as necessary. The following subsections discuss these various reporting mechanisms.

6.1 Status Reviews

AREVA will host monthly and bi-weekly status teleconferences with BEA. For these meetings, AREVA attendees will include, at a minimum, the Project Manager, Project Engineer, and Program Manager. The purpose of these teleconferences is to review the status of the on-going tasks.

In general, the monthly status meetings will include discussion of:

- Work-in-progress
- Status (shown as percent complete) of the tasks
- Progress to date vs. schedule
- Schedule concerns and issues
- Recovery plan for activities behind schedule
- Status of staffing and job hour expenditures
- Highlight of activities in the upcoming month
- Support required from BEA
- To-date costs vs. budget, cost trends, earned value, etc.

The bi-weekly calls will be held between the monthly calls. During these bi-weekly calls, AREVA will present discussion regarding:

- Status of Current Activities
- Key activities for the coming period
- Potential Issue

The following table presents the planned schedule for the bi-weekly and monthly calls. Additional teleconferences may be added later, at the discretion of the AREVA Project Manager. For CY08, the project will stick to the call schedule setup for previous releases under this BMC.



Table 4. Monthly and Bi-weekly Teleconference Schedule

Date	Purpose
January 7, 2009	Bi-weekly Meeting
January 21, 2009	Monthly Meeting
February 4, 2009	Bi-weekly Meeting
February 18, 2009	Monthly Meeting
March 4, 2009	Bi-weekly Meeting
March 18, 2009	Monthly Meeting
April 1, 2009	Bi-weekly Meeting
April 15, 2009	Monthly Meeting
April 29, 2009	Bi-weekly Meeting
May 13, 2009	Monthly Meeting
May 27, 2009	Bi-weekly Meeting

6.2 Monthly Reporting

In addition to monthly teleconference, AREVA will submit monthly written status reports. These written reports will report earned value, estimated costs, and accomplishments achieved during the month. These reports will be issued for FY2009 according to the table following page.

These monthly report will include earned value monthly reporting, with this information at the activity level shown in the Figure 1 schedule. This will not include reporting status of specific milestones, but rather of the actual labor activities.



Table 5. Monthly Report Schedule

Accounting Month	Accounting Period	Due Date
October	October 1- October 26	October 21, 2008
November	October 27 – November 16	November 11, 2008
December	November 17 – December 21	December 16, 2008
January	December 22 – January 25	January 20, 2009
February	January 26 – February 22	February 17, 2009
March	February 23 – March 22	March 17, 2009
April	March 23 – April 19	April 14, 2009
May	April 20 – May 17	May 12, 2009
June	May 18 – June 21	June 16, 2009
July	June 22 – July 26	July 21, 2009
August	July 27 – August 23	August 18, 2009
September	August 24 – September 30	September 22, 2009

6.3 Design Reviews

AREVA will communicate the technical progress of the DDN/PIRT Reconciliation task through a 90% design review prior to issuing the final report. To facilitate this design review, AREVA will provide presentations and drafts of the assigned task reports to BEA reviewers 4 working days prior to 90% review. AREVA will document resolve and incorporate comment resolution into the report prior to the submitting it as the final deliverable. Comments received from BEA and the final resolutions will submitted to BEA for inclusion in the project files.

Due to the nature of the Programmatic Support tasks, as “level of effort” tasks with very limited work scopes, no design reviews will be held for those tasks.



7 References

1. Battelle Energy Alliance, LLC (BEA), Release No. 3 Under Blanket Master Contract No. 00075310, November 4, 2008.
2. Battelle Energy Alliance, LLC (BEA), Statement of Work: AREVA: FY09-1: Conceptual Design Work for the NGNP with Hydrogen Production, Project No. 23843, SOW-6636, Rev. 0, October 1, 2008.