

**ORDER FOR SUPPLIES OR SERVICES**

IMPORTANT: Mark all packages and papers with contract and/or order numbers.

BPA NO. NRC-DR-33-10-324

1. DATE OF ORDER <b>2/22/12</b>	2. CONTRACT NO. (if any) GS35F0125S	6. SHIP TO:	
3. ORDER NO. NRC-T007	MODIFICATION NO.	4. REQUISITION/REFERENCE NO. NRR-12-067	
5. ISSUING OFFICE (Address correspondence to) U.S. Nuclear Regulatory Commission Division of Contracts ATTN: Jerry Purcell Jr. Mail Stop: TWB-01-B10M Washington, DC 20555		a. NAME OF CONSIGNEE U.S. Nuclear Regulatory Commission	
		b. STREET ADDRESS NRR/PMDA/PITB ATTN: Louise Lovell Mail Stop: OWFN-13D	
		c. CITY Washington	e. ZIP CODE 20555

7. TO:	f. SHIP VIA
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a. NAME OF CONTRACTOR AEGIS.NET INC	8. TYPE OF ORDER	
b. COMPANY NAME	<input type="checkbox"/> a. PURCHASE	<input checked="" type="checkbox"/> b. DELIVERY
c. STREET ADDRESS 42 READS WAY	REFERENCE YOUR Please furnish the following on the terms and conditions specified on both sides of this order and on the attached sheet, if any, including delivery as indicated.	
d. CITY NEW CASTLE	e. STATE DE	f. ZIP CODE 197201649

9. ACCOUNTING AND APPROPRIATION DATA B&R: 2012-20-11-5-156 JC: J4698 BOC: 252A APPN: 31X0200.220 FFS: 120796 PSC: D302 NAICS: 541511 Obligation Amount: \$161,000.00	10. REQUISITIONING OFFICE NRR Office of Nuclear Reactor Research
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11. BUSINESS CLASSIFICATION (Check appropriate box(es))	12. F.O.B. POINT Destination
<input type="checkbox"/> a. SMALL <input checked="" type="checkbox"/> b. OTHER THAN SMALL <input type="checkbox"/> c. DISADVANTAGED <input type="checkbox"/> d. WOMEN-OWNED <input type="checkbox"/> e. HUBZone <input type="checkbox"/> f. SERVICE-DISABLED VETERAN-OWNED <input type="checkbox"/> g. WOMEN-OWNED SMALL BUSINESS (WOSB) ELIGIBLE UNDER THE WOMEN-OWNED SMALL BUSINESS PROGRAM <input type="checkbox"/> h. ECONOMICALLY DISADVANTAGED WOMEN-OWNED SMALL BUSINESS (EDWOSB)	

13. PLACE OF	14. GOVERNMENT B/L NO.	15. DELIVER TO F.O.B. POINT ON OR BEFORE (Date) See Attached SOW	16. DISCOUNT TERMS Net 30
a. INSPECTION	b. ACCEPTANCE		

17. SCHEDULE (See reverse for Rejections)

ITEM NO. (a)	SUPPLIES OR SERVICES (b)	QUANTITY ORDERED (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)	QUANTITY ACCEPTED (g)
	Task Order No. 007 under Delivery Order No. NRC-DR-33-10-324  The Contractor shall provide the U.S. Nuclear Regulatory Commission with independent verification and validation for reactor program systems (IV&V) in accordance with the attached statement of work (SOW) and the terms and conditions of GSA Federal Supply Contract No. GS35F0125S, Delivery Order No. NRC-DR-33-10-324 and Task Order No:007.  Reference is made to Aegis.Net, proposal dated February 6, 2012.  See attached pages for details of Task Order No. 007.					

SEE BILLING INSTRUCTIONS ON REVERSE	18. SHIPPING POINT	19. GROSS SHIPPING WEIGHT	20. INVOICE NO.	\$161,000.00	
	21. MAIL INVOICE TO:			\$161,000.00	17(h) TOTAL (Cont. pages)
	a. NAME Dept.of Interior/National Business Ctr. e-mail address: NRCPayments@nbc.gov	b. STREET ADDRESS (or P.O. Box) ATTN: Fiscal Services Branch - D2770 7301 W. Mansfield Avenue	PHONE: FAX:		
	c. CITY Denver,	d. STATE CO	e. ZIP CODE 80235-2230	Obligation \$161,000.00	17(i). GRAND TOTAL

22. UNITED STATES OF AMERICA BY (Signature) 	23. NAME (Typed) William Adams Contracting Officer TITLE: CONTRACTING/ORDERING OFFICER
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## SECTION B - GENERAL TERMS

### B.1 FSS-BPA TERMS AND CONDITIONS

This order is subject to the terms referenced in BPA NRC-DR-33-10-324 and the General Services Administration (GSA) Federal Supply Schedule Contract # GS35F0125S.

### B.2 PRICE SCHEDULE

CLIN Number	Descriptions	Estimated Quantity	Unit	Price Per Hour	Not-To-Exceed
<b>BPA Year 2 Rates 3/01/2012 - 5/18/2012</b>					
1001	IV&V Process Manager	12	Hours	\$187.23	\$2,246.76
1002	IV&V Technical Specialist	100	Hours	\$149.79	\$14,979.00
1003	Senior Functional Analyst	367	Hours	\$133.74	\$49,082.58
1004	Senior Application Engineer	200	Hours	\$112.34	\$22,468.00
1005	Information Technician	100	Hours	\$90.95	\$9,095.00
<b>BPA Year 3 Rates 05/19/2012 - 9/30/2012</b>					
1006	IV&V Process Manager	23	Hours	\$192.52	\$4,427.96
1007	IV&V Technical Specialist	180	Hours	\$154.03	\$27,725.40
1008	Senior Functional Analyst	653	Hours	\$137.52	\$89,800.56
1009	Senior Application Engineer	360	Hours	\$115.51	\$41,583.60
1010	Information Technician	180	Hours	\$93.52	\$16,833.60
<b>Totals:</b>		<b>2,175</b>	<b>Hours</b>		<b>\$278,242.46</b>

#### Option Period 1 - 10/1/2012-09/30/2013

CLIN Number	Descriptions	Estimated Quantity	Unit	Price Per Hour	Not-To-Exceed
<b>BPA Year 3 Rates 10/01/2012 - 5/18/2013</b>					
2001	IV&V Process Manager	38	Hours	\$192.52	\$7,315.76
2002	IV&V Technical Specialist	310	Hours	\$154.03	\$47,749.30
2003	Senior Functional Analyst	1,250	Hours	\$137.52	\$171,900.00
2004	Senior Application Engineer	620	Hours	\$115.51	\$71,616.20
2005	Information Technician	310	Hours	\$93.52	\$28,991.20
<b>BPA Year 4 Rates 05/19/2013 - 9/30/2013</b>					
2006	IV&V Process Manager	22	Hours	\$197.96	\$4,355.12
2007	IV&V Technical Specialist	190	Hours	\$158.38	\$30,092.20
2008	Senior Functional Analyst	750	Hours	\$141.40	\$106,050.00
2009	Senior Application Engineer	380	Hours	\$118.78	\$45,136.40

2010	Information Technician	190	Hours	\$96.17	\$18,272.30
<b>Totals:</b>		<b>4,060</b>	<b>Hours</b>		<b>\$531,478.48</b>

**Option Period 2 - 10/1/2013-09/30/2014**

CLIN Number	Descriptions	Estimated Quantity	Unit	Price Per Hour	Not-To-Exceed
BPA Year 4 Rates 10/01/2013 - 5/18/2014					
3001	IV&V Process Manager	38	Hours	\$197.96	\$7,522.48
3002	IV&V Technical Specialist	310	Hours	\$158.38	\$49,097.80
3003	Senior Functional Analyst	1,250	Hours	\$141.40	\$176,750.00
3004	Senior Application Engineer	620	Hours	\$118.78	\$73,643.60
BPA Year 5 Rates 05/19/2014 - 9/30/2014					
3005	IV&V Process Manager	22	Hours	\$203.56	\$4,478.32
3006	IV&V Technical Specialist	190	Hours	\$162.86	\$30,943.40
3007	Senior Functional Analyst	750	Hours	\$145.40	\$109,050.00
3008	Senior Application Engineer	380	Hours	\$122.13	\$46,409.40
<b>Totals:</b>		<b>3,560</b>	<b>Hours</b>		<b>\$497,895.00</b>

**Option Period 3 - 10/1/2014-05/16/2015**

CLIN Number	Descriptions	Estimated Quantity	Unit	Price Per Hour	Not-To-Exceed
BPA Year 5 Rates 10/01/2014 - 5/18/2015					
4001	IV&V Process Manager	38	Hours	\$203.56	\$7,735.28
4002	IV&V Technical Specialist	312	Hours	\$162.86	\$50,812.32
4003	Senior Functional Analyst	1,250	Hours	\$145.40	\$181,750.00
4004	Senior Application Engineer	625	Hours	\$122.13	\$76,331.25
<b>Totals:</b>		<b>2,225</b>	<b>Hours</b>		<b>\$316,628.85</b>

<b>Grand Total</b>	<b>12,020</b>	<b>\$1,624,244.79</b>
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**B.3 52.217-8 OPTION TO EXTEND SERVICES (NOV 1999)**

The Government may require continued performance of any services within the limits and at the rates specified in the contract. These rates may be adjusted only as a result of revisions to prevailing labor rates provided by the Secretary of Labor. The option provision may be exercised more than once, but the total extension of performance hereunder shall not exceed 6 months. The Contracting Officer may exercise the option by written notice to the Contractor within 30 days.

**B.4 52.217-9 OPTION TO EXTEND THE TERM OF THE CONTRACT (MAR 2000)**

(a) The Government may extend the term of this contract by written notice to the Contractor within 30 days; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least 90 days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed 5/16/2015.

## **B.5 52.232-22 LIMITATION OF FUNDS (APR 1984)**

(a) The parties estimate that performance of this contract will not cost the Government more than (1) the estimated cost specified in the Schedule or, (2) if this is a cost-sharing contract, the Government's share of the estimated cost specified in the Schedule. The Contractor agrees to use its best efforts to perform the work specified in the Schedule and all obligations under this contract within the estimated cost, which, if this is a cost-sharing contract, includes both the Government's and the Contractor's share of the cost.

(b) The Schedule specifies the amount presently available for payment by the Government and allotted to this contract, the items covered, the Government's share of the cost if this is a cost-sharing contract, and the period of performance it is estimated the allotted amount will cover. The parties contemplate that the Government will allot additional funds incrementally to the contract up to the full estimated cost to the Government specified in the Schedule, exclusive of any fee. The Contractor agrees to perform, or have performed, work on the contract up to the point at which the total amount paid and payable by the Government under the contract approximates but does not exceed the total amount actually allotted by the Government to the contract.

(c) The Contractor shall notify the Contracting Officer in writing whenever it has reason to believe that the costs it expects to incur under this contract in the next 60 days, when added to all costs previously incurred, will exceed 75 percent of (1) the total amount so far allotted to the contract by the Government or, (2) if this is a cost-sharing contract, the amount then allotted to the contract by the Government plus the Contractor's corresponding share. The notice shall state the estimated amount of additional funds required to continue performance for the period specified in the Schedule.

(d) Sixty days before the end of the period specified in the Schedule, the Contractor shall notify the Contracting Officer in writing of the estimated amount of additional funds, if any, required to continue timely performance under the contract or for any further period specified in the Schedule or otherwise agreed upon, and when the funds will be required.

(e) If, after notification, additional funds are not allotted by the end of the period specified in the Schedule or another agreed-upon date, upon the Contractor's written request the Contracting Officer will terminate this contract on that date in accordance with the provisions of the Termination clause of this contract. If the Contractor estimates that the funds available will allow it to continue to discharge its obligations beyond that date, it may specify a later date in its request, and the Contracting Officer may terminate this contract on that later date.

(f) Except as required by other provisions of this contract, specifically citing and stated to be an exception to this clause--

(1) The Government is not obligated to reimburse the Contractor for costs incurred in excess of the total amount allotted by the Government to this contract; and

(2) The Contractor is not obligated to continue performance under this contract (including actions under the Termination clause of this contract) or otherwise incur costs in excess of--

(i) The amount then allotted to the contract by the Government or;

(ii) If this is a cost-sharing contract, the amount then allotted by the Government to the contract plus the Contractor's corresponding share, until the Contracting Officer notifies the Contractor in writing that the amount allotted by the Government has been increased and specifies an increased amount, which shall then constitute the total amount allotted by the Government to this contract.

(g) The estimated cost shall be increased to the extent that (1) the amount allotted by the Government or, (2) if this is a cost-sharing contract, the amount then allotted by the Government to the contract plus the Contractor's corresponding share, exceeds the estimated cost specified in the Schedule. If this is a cost-sharing contract, the increase shall be allocated in accordance with the formula specified in the Schedule.

(h) No notice, communication, or representation in any form other than that specified in paragraph (f)(2) of this clause, or from any person other than the Contracting Officer, shall affect the amount allotted by the Government to this contract. In the absence of the specified notice, the Government is not obligated to reimburse the Contractor for any costs in excess of the total amount allotted by the Government to this contract, whether incurred during the course of the contract or as a result of termination.

(i) When and to the extent that the amount allotted by the Government to the contract is increased, any costs the Contractor incurs before the increase that are in excess of--

(1) The amount previously allotted by the Government or;

(2) If this is a cost-sharing contract, the amount previously allotted by the Government to the contract plus the Contractor's corresponding share, shall be allowable to the same extent as if incurred afterward, unless the Contracting Officer issues a termination or other notice and directs that the increase is solely to cover termination or other specified expenses.

(j) Change orders shall not be considered an authorization to exceed the amount allotted by the Government specified in the Schedule, unless they contain a statement increasing the amount allotted.

(k) Nothing in this clause shall affect the right of the Government to terminate this contract. If this contract is terminated, the Government and the Contractor shall negotiate an equitable distribution of all property produced or purchased under the contract, based upon the share of costs incurred by each.

(l) If the Government does not allot sufficient funds to allow completion of the work, the Contractor is entitled to a percentage of the fee specified in the Schedule equalling the percentage of completion of the work contemplated by this contract.

## **B.6 NRC Acquisition Clauses - (NRCAR) 48 CFR Ch. 20**

## **B.7 TASK/DELIVERY ORDER PERIOD OF PERFORMANCE (AUG 2011)**

This order shall commence on 03-01-2012 and will expire on 05-16-2015.

## **B.8 WHISTLEBLOWER PROTECTION FOR NRC CONTRACTOR AND SUBCONTRACTOR EMPLOYEES (AUG 2011)**

(a) The U.S. Nuclear Regulatory Commission (NRC) contractor and its subcontractor are subject to the Whistleblower Employee Protection public law provisions as codified at 42 U.S.C. 5851. NRC contractor(s) and subcontractor(s) shall comply with the requirements of this Whistleblower Employee Protection law, and the

implementing regulations of the NRC and the Department of Labor (DOL). See, for example, DOL Procedures on Handling Complaints at 29 C.F.R. Part 24 concerning the employer obligations, prohibited acts, DOL procedures and the requirement for prominent posting of notice of Employee Rights at Appendix A to Part 24 entitled: "Your Rights Under the Energy Reorganization Act".

(b) Under this Whistleblower Employee Protection law, as implemented by regulations, NRC contractor and subcontractor employees are protected from discharge, reprisal, threats, intimidation, coercion, blacklisting or other employment discrimination practices with respect to compensation, terms, conditions or privileges of their employment because the contractor or subcontractor employee(s) has provided notice to the employer, refused to engage in unlawful practices, assisted in proceedings or testified on activities concerning alleged violations of the Atomic Energy Act of 1954 (as amended) and the Energy Reorganization Act of 1974 (as amended).

(c) The contractor shall insert this or the substance of this clause in any subcontracts involving work performed under this contract.

## **B.9 GREEN PURCHASING (JUN 2011)**

(a) In furtherance of the sustainable acquisition goals of Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance" products and services provided under this contract/order shall be energy- efficient (Energy Star or Federal Energy Management Program (FEMP) designated), water-efficient, biobased, environmentally preferable (e.g., Electronic Product Environmental Assessment Tool (EPEAT) certified), non-ozone depleting, contain recycled content, or are non-toxic or less toxic alternatives, where such products and services meet agency performance requirements. <http://www.fedcenter.gov/programs/eo13514/>

(b) The contractor shall flow down this clause into all subcontracts and other agreements that relate to performance of this contract/order.

## **SECTION C - STATEMENT OF WORK**

### **"COMPUTER INDEPENDENT VERIFICATION AND VALIDATION SERVICES"**

#### **1.0 BACKGROUND**

##### **(1) RPS Legacy Systems**

The Office of Nuclear Reactor Regulation (NRR) and the Office of Information Services (OIS) of the U.S. Nuclear Regulatory Commission (NRC) require independent verification and validation (IV&V) services for the NRR Reactor Program Systems (RPS) currently operational, systems under development, and legacy systems replacement efforts. The NRC NRR currently has the following legacy modules which are integrated into the RPS system:

- Inspection Planning and Assessment System (IPAS)
- Inspection Planning Cycle System (IPC)
- Inspection Reporting and Tracking System (IRTS)
- Inspection Procedures (IP)
- Inspection Reporting (IR)
- Reactor Operating Programs (ROP)
- Reporting module (REPORTS)

- Security Access Module (SAM)
- Tables used by Systems (TABLES)
- TAC Resource Information Management (TRIM)

In addition the following legacy systems are being incorporated into the RPS system, and will require IV&V support services:

- Dynamic Web Page (DWP)
- Human Factors Information System (HFIS)
- Operator Licensing Tracking System (OLTS)
- Reactor Operations and Events (ROE)
- External web version of ROE (ROEWEB)

(2) RPS Legacy Interfaces and shared data transfers

The RPS is a core agency system which interfaces and shares data with the following systems. As a result, these existing interfaces and shared data transfers may require IV&V support services:

- Human Resource Management System (HRMS)
- License Tracking System (LTS)
- Financial Accounting and Information Management System (FAIMIS)
- Enforcement Action Tracking System (EATS)
- Office of Investigation Management Information System (OIMIS)
- Allegation Management System (AMS)
- Case Management System
- Cost Accounting System (CAS)
- Enterprise Project Management (EPM)
- Program Management and Notification System (PMNS)
- Technical Assignment Control System (TACS)
- General License Tracking System (GLTS)

(3) Future Requirements/additional task

OIS is planning a replacement for the current Sybase Database product which is used by RPS. Although RPS planning is underway for a suitable replacement RPS Database, the alternatives analysis, investment planning, and scheduling is incomplete at this time. The alternatives analysis may also include a replacement development effort for the legacy RPS systems. Support under this Task Order may require future IV&V oversight for planning, analysis, and testing related to migrating the legacy RPS Database and replacement systems.

(4) RPS Systems, Security Management, and Authority to Operate

The RPS resides and is operated on an OIS platform and security controls which are reported under the Business Application Support System (BASS) Authorization To Operate. Although RPS inherits primary security controls from BASS, there are RPS specific security controls related to user data access and application level permission controls. The type of information processed in RPS and related systems is primarily categorized as Sensitive Unclassified Information System at a moderate security level. RPS processes reactor licensing and inspection data used for internal tracking and reporting. RPS data is not accessible or available to users outside the NRC.

(5) RPS Systems under OIS Management of RPS Operations Facility

OIS manages the BASS systems, which includes the RPS subsystems. Systems under BASS are hosted internally for production. A new consolidated environment facility which will be used for development and testing is located near the

Rockville headquarters office. Support under this Task Order will primarily utilize the agency LAN and VPN connections to RPS servers and IBM Rational Unified Process (RUP) software toolset. There may be occasional local travel to the new consolidated environment facility for IV&V testing and validation.

(6) Management Processes -- NRC General Statement of Work

This specific Task Order for NRR RPS Systems is under the general Statement of Work for Independent Verification and Validation for the U.S. Nuclear Regulatory Commission, Office of Information Systems (OIS). The general SOW requires use of the agency Project Management Methodology (PMM) for information systems. Additional information is available from the OIS web site: <http://www.internal.nrc.gov/pmm/>.

The contractor will use relevant OIS Management Directive (MD) 2.8, Project Management Methodology (PMM) requirements to evaluate and support NRR RPS steady state systems and planned new initiatives which are included in this Task Order.

The scope of this specific RPS Task Order is not inclusive of the entire PMM processes. The RPS steady state investments will require systems maintenance and enhancement activities. The planned new initiatives will require systems analysis, planning, and implementation.

Below is a sampling of activities included in the agency PMM processes.

- System Integration Planning Studies
- System Feasibility Studies
- Technology Analysis and Assessments
- Systems Planning
  - Requirements Definition
  - Business Case Review
  - Project Schedule, Cost, and Spending Plan, and Assessments
  - Review and Recommendations in new processes and maintenance procedures
- Systems Implementation
  - Functional Gap Analysis
  - Requirements Validation
  - Design Review
- Systems Maintenance and Enhancement
  - Review Project Performance Monitoring
  - Review of Software Developer Contractor Deliverables
  - Review and audit of systems design
    - Review and audit of developer code
    - Code Reconciliation Reviews
    - Regression Testing
  - User Acceptance Testing
  - Security control Validation
- Systems Operations and Change Management
  - Review of Change Request and problem analysis
  - Independent Verification and Analysis
  - Review of Software Changes and Specifications
    - Independent Risk and Remediation analysis
    - Independent recommendations to Configuration/Change Control Board (CCB)



## 2.0 OBJECTIVES

The over-all objective of this Task Order is to provide independent and expert information technology support services for the NRR RPS steady state systems, interfaces, and new initiatives planned for RPS refresh. Specifically the Contractor shall:

- (1) Evaluate RPS modules, related systems, and interfaces (see Section 1.0) to identify deficiencies and issues with data integrity, reliability, security, and efficiency.
- (2) Research and evaluate system and design requirements and other documents to ensure that Change Requests are effectively planned and implemented. Recommend alternative design solutions, as needed.
- (3) Provide independent analysis of problems and issues; provide solutions and recommendations, as needed.
- (4) Independently review developer test planning to ensure that thorough analysis, design, development, testing, and reporting of all required functionality is completed.
- (5) Independently develop test scripts and conduct Regression Testing for RPS releases; provide results and recommendations (use of automated testing tools and techniques is desired).
- (6) Independently validate release test results against requirements and expectations; ensure that functionality is implemented as planned to meet user expectations.
- (7) Provide findings reports containing specific recommendations for actionable items continuously throughout the process.
- (8) Provide supporting analysis for new initiatives and updates to the Business Case for technology improvements or replacements of RPS legacy systems.
- (9) Provide supporting IV&V design and modeling analysis, planning and implementation oversight, reviews, testing, and verifications throughout the RPS Database Migration project work, including establishing IV&V processes for Database Migration
- (10) Provide supporting IV&V design and analysis, planning and implementation oversight, reviews, testing, and verifications supporting future replacements of RPS legacy systems.

## 3.0 SCOPE OF WORK

The contractor shall perform independent verification and validation services for the NRR RPS systems in accordance with the Statement of Work. This support shall include but not be limited to:

- Maintain an IV&V process for on-going problem research and Change Requests (CRs) to the operational systems;
- develop and establish new IV&V Regression Testing processes including code reconciliation;
- develop and establish new IV&V Database Migration processes;
- support IV&V evaluation and analysis for developer testing;
- support resolution of software-related issues;
- evaluate of IV&V test planning, test validation, execution, and reporting;
- conduct independent IV&V feature and regression testing for releases;
- provide IV&V findings reports containing specific recommendations for actionable items continuously throughout the process;

- support IV&V analysis and updates to the Business Case for technology improvements to RPS; and
- support IV&V planning, analysis, and testing of RPS Database Migration and replacement of RPS legacy systems activities.

The RPS maintenance releases are generally grouped by modules and include CRs, including fixes and enhancements, which have been requested by NRR headquarters and regional staff (RPS Counterparts). These proposed CRs are generally reviewed in Configuration Control Board (CCB) meetings and grouped into Quarterly Releases. These maintenance releases will require IV&V analysis in advance of User Acceptance Testing (UAT), independent evaluation of user requested changes, proposed technical solutions, assessment of applications and interfaces to verify the technical approach, review of test planning, and validation of results in conjunction with NRR's UAT. The IV&V legacy RPS support work for the steady state systems includes analysis, testing, and recommendations for RPS systems (implemented in PowerBuilder, Sybase, ColdFusion, and web publishing technologies).

The IV&V RPS Regression Testing is a new initiative which is currently under consideration because of the high level of unanticipated problems and fixes required in RPS modules. The work is expected to include the development of Test Suites and data associated with each of the current RPS modules and interfaces. In addition, the work is expected to include evaluation and introduction of automated testing tools, such as code comparisons, scripting, and simulation.

The Technology Refresh and Technology Improvement plans for RPS started in FY2010 as a prototype project. At this time, the timing and scope of the Refresh Project is undecided. It is expected that the future IV&V work will include studies, analysis, and oversight of development work to re-platform the RPS client server systems utilizing products and technologies in the agency Technical Reference Model. The IV&V work is oversight of the RPS Refresh project work.

## **4.0 SPECIFIC TASK REQUIREMENTS**

### **4.1.1 Task 1 – RPS Management Processes (on-going)**

#### **The Contractor shall:**

1. Review current process for managing IV&V CRs. Provide recommendations for improving the current IV&V CR processes.
2. Develop a new verification process for Code Reconciliation. The process should include software tools, procedures, reviews, reporting, and approvals to verify that the changes to software code occur where expected and that there are no unexpected outcomes as a result.
3. Develop recommendations for IV&V Regression Testing tools. The study and recommendations should look at alternatives and tools used currently on other NRC projects.
4. Develop a new IV&V process for establishing and maintaining a Regression Testing library. The process should consider use of the current and future IBM RUP toolsets, and linkages to functional requirements and CRs.
5. Develop a new IV&V process for Regression Testing of RPS planned releases. The process should include use of automated tools (code reconciliation, script generators, batch test suites, simulators, RUP linkages to requirements)
6. Develop/create test data according to testing needs and document the expected test results. Ensure that test data validates the module's logic. Ensure that the test data validates all module source code and each conditional logical branch.

7. Develop a new IV&V process for RPS Database Migration and replacement of RPS legacy systems. The IV&V process should include, but is not limited to, review of the analysis and approach, proposed use of tools, techniques, analytics, and best practices to ensure data integrity, migration process reliability, methods of validation, and plans to document operational procedures.

## **Standards**

1. Review of current CR Processes for IV&V

The contractor shall review, evaluate, and make recommendations for improving the current CR processes for IV&V. The review report shall include (1) an evaluation of the current processes; (2) assessment level of effort and value added by CRs; and (3) summary of risks that were reduced as a result of the IV&V CR process.

2. New IV&V Code Reconciliation Processes

The contractor shall develop a new process for isolating and comparing code changes for new releases with the legacy code. The process should be implemented as a verification step.

The process at a minimum includes (1) Code Reconciliation Summary (1 page) which describes the planned code comparison and results; (2) a review meeting with the RPS PM and ISSO to discuss results and related risks; (3) an approval process with sign off for proceeding with the release based on the results of the reconciliation process.

The Code Reconciliation Summary also includes the detail activity related to the CR and potential impacts from the changes on other functional areas.

3. New IV&V Regression Testing Tools Study

The contractor shall deliver a Tools Study which includes alternative tools, benefits, and proposed use for the RPS testing scripts.

The report shall be approximately 6 to 10 pages in length.

4. New IV&V Regression Testing Library

The contractor shall plan, develop, and maintain a Library of Regression Testing Suites. The Suites are aggregations of automated scripted tests which are run when changes have occurred to RPS modules, functional processes/rulesets, and/or interfaces.

5. New IV&V Regression Testing Processes

The contractor shall develop a new process for planning, executing, and completing regression testing for changes to legacy code. The process should be implemented as a functional validation step prior to all RPS production releases. The process includes at a minimum:

- (1) IV&V Regression Testing Summary (1 page) that describes the planned regression scripting, test suites, and results.

- (2) IV&V Review meeting with the RPS PM and ISSO to discuss results, failure points, related risks, and potential additional testing required;

- (3) IV&V Approval process with sign-off for proceeding with the release based on the results. The Regression Testing Summary also includes the detail activity related to the CR, affected modules, and potential impacts on other related modules from the functional changes.

6. IV&V Oversight of RPS Database Migration and replacement of RPS legacy systems

The contractor shall develop a new IV&V process for planning, executing, and completing a migration of the RPS Database tables from the legacy Sybase Database products to a new Database product line (e.g. IBM DB2) and/or replacement of legacy RPS systems.

The current Database design includes legacy design inefficiencies, lacks normalization in relational design and referential integrity, and feedback.

The IV&V process will need to include analytics of the legacy design, recommendations for alternative design considerations and efficiencies, tool recommendations, and oversight of migration activities to ensure data integrity and reliability.

The Database Migration IV&V process should be implemented as validation and oversight steps for completing a Database migration. The RPS Database Migration IV&V oversight process includes, but is not limited to:

- (1) Oversight Planning Study with approximately 6 pages, which describes the design verification, re-design and modeling work, use of data migration tools and analytics, and planned migration activities; verification procedures for post migration verification; and synchronization and operational processes.
- (2) Interfaces Planning Study with approximately 6 pages, which describes the affected interfaces and owners, verification used to validate interface migration, risks and mitigation activities needed to migrate the RPS interfaces.
- (3) Readiness Review with the RPS PM and ISSO to discuss effectiveness of the migration plans and scheduled activities, including potential risks, protections for data integrity, mitigation plans for failure and data synchronization issues; and recommendations for any additional migration work that may be required. The outcome of the readiness review should be an agreement to proceed with the Migration Plan
- (4) Migration Approval process with sign off for proceeding with the Migration Plan based on the results of the Readiness Review.
- (5) Oversight Implementation Reviews with approximately 6 pages, which occur throughout the migration work and provide on-going status assessments, issue identification, alternative course correction and mitigation recommendations, and descriptions of any additional migration work that may be needed to reduce risks or resolve known issues.
- (6) Oversight Performance Reviews with approximately 6 pages, which occur throughout the migration work and metrics related to database performance; the intent of these reviews is to proactively identify problems and provide iterative tuning and database design adjustments to improve performance.
- (7) Oversight Production Reviews with approximately 6 pages, which occur throughout the migration work and provide input and adjustments to planned production and operational procedures. The final review should result in an agreement for readiness to release the Migrated Database to production.
- (8) Production Release Approval process with approximately 6 pages, which provide a sign-off for releasing the migrated Database into production. The Production Release Approval Summary includes a detailed checklist of the implementation plan activities, potential risks and impacts on

other production data systems that interface with the migrated RPS Database, and mitigation actions (e.g. Rollback procedures).

**Deliverables**

For Task 1, RPS Management Processes (above), the contractor shall deliver the following:

Item	Name	Due Date
1	RPS Monthly Status Report	1 <sup>st</sup> Friday of each month
2	Review of IV&V Process for Change Requests	10 work days after kick off meeting with contractor (review deliverable)
3	New IV&V Code Reconciliation Process	10 work days after kick off meeting with contractor (process deliverable)
4	New IV&V Regression Testing Tools Study	20 work days after kickoff meeting with contractor (study deliverable)
5	New IV&V Regression Testing Library of Testing Suites	30 work days after kickoff meeting with contractor (plan deliverable)
6	New IV&V Regression Testing Processes	40 work days after kick off meeting with contractor (process deliverable)
7	New RPS Database Migration IV&V Processes and/or replacement of RPS legacy systems	Per RPS PM request (process deliverable)
8	NRC Contracting Officer Representative approval of Deliverables	5 work days after receipt of Deliverable

**4.1.2 Task 2 – RPS Software Maintenance Releases (to commence on June 1, 2012)**

The contractor shall:

1. Maintain and manage IV&V CRs; provide monthly status updates which include work accomplished, work planned, expected closing date, and any issues related to open CRs.
2. Maintain and manage IV&V Code Reconciliation processes for RPS, including updates to tools and processes.
3. Maintain and manage IV&V Regression Testing processes for RPS, including on-going development of new test scripts, updates to the Library of RPS Test Suites, and updates to automated tools.

4. Conduct on-going IV&V evaluations of RPS systems and open CRs to proactively identify deficiencies and issues with data integrity, reliability, security, and operating efficiency.
5. Participate in RPS CCB reviews of CRs and provide advice to the RPS PM regarding the risks and benefits of CRs under review.
6. Conduct IV&V activities on specific CRs, as assigned by the RPS PM:
  - analyze specific CRs and conduct technical analysis, including feasibility, effectiveness, design consistency, implementation completeness, integrity of data and functionality, and testability.
  - update documentation related to the CR to ensure clarity and completeness.
  - conduct independent analysis of identified problems and research to provide solutions and recommendations.
  - conduct independent analysis to validate that the proposed approach and estimated resources required for implementation are realistic and effective.
  - provide independent technical analysis and recommendations to the RPS PM.
  - validate that plans for testing the CR are effective for ensuring verification of data, reporting, and functionality required.
  - verify that the acceptance test scenarios satisfy the test criteria and will ensure the implementation meets requirements.
7. Independently setup and run IV&V Code Reconciliation test tools to verify software changes were made implementing a CR or planned software release.
8. Independently develop and run automated new IV&V Test Scripts for correctness and completeness of the functional requirements.
9. Independently develop and run automated IV&V Regression Test Scripts to verify correctness of existing code.
10. Provide results of IV&V Code Reconciliation, Functional, and Regression Testing to RPS PM with recommendations and update Library of Regression Test scripts, as appropriate.
11. Participate in CCB deployment reviews of CRs and provide guidance on risks and recommendations to the RPS PM.
12. Provide supporting analysis and updates to the Business Case for new initiatives and technology improvements to RPS.
13. Provide supporting IV&V design and modeling analysis, planning and implementation oversight, reviews, testing, and verifications throughout the RPS Database Migration and/or replacement of RPS legacy systems (per IV&V Management Processes that were established above).

## **Standards**

### **1. On-going IV&V Change Request Processes**

The current IV&V Change Request process resides on an internal NRR Sharepoint site. For each CR, the contractor creates and maintains a CR report (Word document). The CR report includes a 1 page executive summary, results of the CR review and recommendations. The CR report may also include the detail activity related to the Change Request (activities, testing, issues, and results). The contractor shall continue to maintain CR reports for each CR.

### **2. On-going New IV&V Code Reconciliation Processes**

The contractor shall maintain a report template for each RPS release. The report template includes at a minimum:

- (1) Code Reconciliation Summary (approximately 1 page) which describes the planned code comparison and results of the comparisons;
- (2) Summary of the Review meeting with the RPS PM and ISSO on results and related risks; and
- (3) Approvals for proceeding with the release.

The Code Reconciliation Summary also includes the detail activity related to the CR and potential impacts from the changes on other functional areas and interfaces.

### **3. On-going New IV&V Regression Testing Library**

The contractor shall plan, develop, and maintain a Library of Regression Testing Suites. The Suites are aggregations of automated scripted tests which are run when changes have occurred to RPS modules, functional processes/rulesets, and/or interfaces.

### **4. On-going New IV&V Regression Testing Processes**

The contractor shall implement new IV&V processes for planning, executing, and completing automated regression testing for changes in new releases with legacy code. The IV&V processes should be implemented as a functional validation step for all RPS production releases.

The IV&V processes include at a minimum, but are not limited to:

- (1) IV&V Regression Testing Summary (approximately 1 page) that describes the planned regression scripting, test suites, and results;
- (2) IV&V Review meeting with the RPS PM, IV&V, and ISSO to discuss results, failure points, related risks, and potential additional testing required;
- (3) IV&V Approval process with sign off for proceeding with the release based on the results.

The IV&V Regression Testing Summary also includes the detail activity related to the CR, affected modules, and potential impacts on other related modules from the functional changes.

### **5. IV&V Oversight of RPS Database Migration and/or replacement of RPS legacy systems**

The contractor shall implement new IV&V process for planning, executing, and completing a migration of the RPS Database tables from the current legacy Sybase DB vendor products to a new DB vendor product line (e.g. IBM DB2 products).

The DB Migration IV&V process should be implemented as validation and oversight steps for completing a DB migration. The RPS DB Migration IV&V oversight process includes, but is not limited to:

- (1) IV&V Oversight Planning Study with approximately 6 pages, which describes the design verification, re-design and modeling work, use of data migration tools and analytics, and planned migration activities; verification procedures for post migration verification; and synchronization and operational processes.
- (2) IV&V Interfaces Planning Study with approximately 6 pages, which describes the affected interfaces and owners, verification used to validate interface migration, risks and mitigation activities needed to migrate the RPS interfaces.
- (3) IV&V Readiness Review with the RPS PM and ISSO to discuss effectiveness of the migration plans and scheduled activities, including potential risks, protections for data integrity, mitigation plans for failure and data synchronization issues; and recommendations for any additional migration work that may be required. The outcome of the readiness review should be an agreement to proceed with the Migration Plan
- (4) Migration Approval process with sign off for proceeding with the Migration Plan based on the results of the Readiness Review.
- (5) Oversight Implementation Reviews with approximately 6 pages, which occur throughout the migration work and provide on-going status assessments, issue identification, alternative course correction and mitigation recommendations, and descriptions of any additional migration work that may be needed to reduce risks or resolve known issues.
- (6) Oversight Performance Reviews with approximately 6 pages, which occur throughout the migration work and metrics related to database performance; the intent of these reviews is to proactively identify problems and provide iterative tuning and database design adjustments to improve performance.
- (7) Oversight Production Reviews with approximately 6 pages, which occur throughout the migration work and provide input and adjustments to planned production and operational procedures. The final review should result in an agreement for readiness to release the Migrated Database to production.
- (8) Production Release Approval process with approximately 6 pages, which provide a sign-off for releasing the migrated Database into production. The Production Release Approval Summary includes a detailed checklist of the implementation plan activities, potential risks and impacts on other production data systems that interface with the migrated RPS Database, and mitigation actions (e.g. Rollback procedures).



**Deliverables**

For Task 2, RPS Software Upgrade Releases (above), the contractor shall deliver the following:

Item	Name	Due Date
1	Monthly CR Status Updates	1 <sup>st</sup> Friday of month
2	Updates to IV&V Code Reconciliation Processes	As needed
3	Updates to IV&V Regression Testing Processes	As needed
4	IV&V Evaluation Studies	Per RPS PM request
5	Participate in RPS CCB Reviews of CRs	As scheduled by RPS PM
6	Conduct IV&V activities on specific CRs, as assigned Analysis and studies CR documentation updates Problem analysis and solutions Estimated resource analysis Test plan validation Acceptance test validation	Per RPS PM request
7	IV&V Code Reconciliation Tests	Per RPS PM request.
8	New IV&V Functional Test Scripts	Per RPS PM request
9	IV&V Regression Test Scripts	Per RPS PM request
10	IV&V Reports of Testing Results	Per RPS PM request
11	Participate in RPS CCB deployment reviews for CRs	As scheduled by RPS PM
12	Analysis and updates to Business Case for new initiatives and technology improvements to RPS	Per RPS PM request
13	Provide supporting IV&V design and modeling analysis; planning and implementation oversight; reviews, testing, and verifications throughout the RPS Database Migration and/or replacement of RPS legacy systems (per IV&V	Per RPS PM request

	Management Processes that were established above)	
	NRC COR approval	5 working days after receipt of Deliverable

## 5.0 ACCEPTANCE CRITERIA

For Task 1 in Section 4.0 above, the contractor shall prepare Deliverables to establish new IV&V processes, as described. Each Deliverable shall include analysis and discussion of topics as outlined above. Recommendations for toolsets and libraries shall be consistent with best practices and usage in the agency. The report deliverables shall provide sufficient detail to ensure new processes are implemented efficiently and effectively with complete and well documented procedures and methodologies. All deliverable products shall be grammatically correct according to industry standard rules and contain correct spelling. All technical and financial terms shall be clearly defined to be understood by all readers. All final deliverable products will be approved in writing by the PO or a designated representative.

For Task 2 in Section 4.0 above, the contractor shall prepare a Final IV&V Report for Each Change Request Provided. The Report shall include, at a minimum, analysis of Change Request, validation of implementation approach, verification of test results, and recommendations. The report deliverable should provide sufficient detail to ensure completeness, consistency, correctness, and accuracy of the work performed. All deliverable products shall be grammatically correct according to industry standard rules and contain correct spelling. All technical and financial terms shall be clearly defined to be understood by all readers. All final deliverable products will be approved in writing by the PO or a designated representative.

## 6.0 MEETINGS AND TRAVEL

### 6.1 Kick-off Meeting

For Task 1 and Task 2 in Section 4.0 above, the contractor shall participate in a kick-off meeting no later than five (5) business days after award to introduce the NRC Contracting Officer, and the Contracting Officer Representative. The purpose of the meeting is to review and discuss the NRR's goals for the project and to establish contractor/NRC communications report framework for the project. Further, discussion shall include the PMM phases and corresponding deliverables as identified in Section 5.0, Deliverables. Internal NRC documents will be coordinated during this meeting.

### 6.2 Monthly Status Review Meetings

The contractor shall meet on the Monday following the first Friday of the month, or next business day, to review the Monthly Status Report. The purpose of the status meeting is to review work accomplishments, work planned, and issues.

### 6.3 RPS CCB Meetings

The contractor shall participate in RPS CCB meetings to support the RPS PM. The purpose of the monthly RPS CCB meeting is to review status of Change Requests and make investment decisions for the RPS systems.

#### 6.4 Deliverable Meetings

For Task 1, RPS Management Processes, in Section 4.0 above, the contractor shall meet with the RPS PM to review Deliverables and respond to any questions. The purpose of the meeting is to clarify the Deliverable, identify and issues or concerns, and expedite the review of the Deliverable.

For Task 2, RPS Software Upgrade Releases, in Section 4.0 above, the contractor shall meet as needed by the RPS PM to review Deliverables in support of the IV&V activities.

#### 6.5 Travel

For Tasks 1 and 2 in Section 4.0 above, the contractor shall complete work associated with these tasks at the NRC Headquarters in Rockville, MD, unless a request for working at contractor site has been approved. Travel to other locations will not be required. Travel may be required for IV&V testing activities at the OIS managed facility which is nearby the NRC Headquarters buildings.

### 7.0 GOVERNMENT FURNISHED MATERIALS AND EQUIPMENT

To facilitate the work to be performed, the NRC will, upon request, provide the contractor with any and all materials documenting current applications systems, processes, requirements, and access to Government and other contractor personnel as required.

### 8.0 PERIOD OF PERFORMANCE

The periods of performance of this task order are as follows:

Base period-	03/1/2012 -	9/30/2012
Option Period 1 -	10/1/2012 -	9/30/2013
Option Period 2 -	10/1/2013 -	9/30/2014
Option Period 3 -	10/1/2014 -	5/16/2015

### 9.0 STAFFING AND ESTIMATED LEVEL OF EFFORT

#### 9.1 Technical Expertise and Certifications

For RPS Legacy systems, the contractor shall provide staff with appropriate expertise, certifications and experience for supporting the current PowerBuilder, Sybase, and ColdFusion systems.

For the new initiatives which are described above, including Code Reconciliation, Regression Testing, Refresh, and Database Migration, the contractor shall provide staff with a range of technical expertise and certifications and commensurate with the work to be accomplished. The contractor shall ensure the level of staff expertise establishes credibility and confidence in the technical accuracy of IV&V contractor analysis, assessments, recommendations, and test results.

System	Technologies requiring technical expertise within the IV&V contractor team
IBM RUP toolset for development and testing	<p>Legacy IBM RUP tools have included Software Architect, Rational Functional Tester, ClearQuest, ClearCase, and Test Manager.</p> <p>These are being upgraded as of January 31, 2012. The new agency contract supporting RPS Maintenance and Operations will leverage Rational Jazz platform to enable project team collaboration. This platform will be integrated with IBM Rational tool updates, including Team concert, Requirements Composer, and Quality Manager. Requirements will be managed by Rational Requirement Composer under the Jazz platform. IV&amp;V staff may need to work with these new tools to gain access to project artifacts.</p>

Business Intelligence Reporting tools	The BI toolset for RPS is undecided at this time. Options include - Microsoft Business Intelligence - SAP Business Objects.
RPS Legacy Systems	PowerBuilder, Sybase, ColdFusion and IBM RUP tools as detailed above
IV&V Code Reconciliation	Toolset to be recommended by IV&V study
IV&V Regression Testing Tools	Toolset to be recommended by IV&V study
RPS Refresh initiatives	The refresh technologies are undecided at this time. Options include - Java standard products, such as J2EE and Struts; - Microsoft .NET, Visual Basic, SQL Server, Structured Query Language; - Microsoft IIS (preferred web server).
RPS DB Migration initiative	New RPS Database Migration technologies are undecided at this time. Options include - IBM DB2 Database, IBM SQL Skin Translator - Microsoft SQL Database Note: Oracle Database is not a preferred Database platform under the new agency contract for RPS Maintenance and Operations.

## 9.2 Level of Effort

The estimated level of effort for this task order by labor category is:

Staffing	Estimated Level of Effort	
IV&V Process (Project) Manager	Baseline (7 months)	35 hours
	Option Year 1 (12 months)	60 hours
	Option Year 2 (12 months)	60 hours
	Option Year 3 (12 months)	60 hours
	Total Hours = 215 hours	
Senior Functional Analyst	Baseline (7 months)	1,020 hours
	Option Year 1 (12 months)	2,000 hours
	Option Year 2 (12 months)	2,000 hours
	Option Year 3 (12 months)	2,000 hours
	Total Hours = 7,020 hours	
Senior Application Engineer	Baseline (7 months)	560 hours
	Option Year 1 (12 months)	1,000 hours
	Option Year 2 (12 months)	1,000 hours
	Option Year 3 (12 months)	1,000 hours
	Total Hours = 3,560 hours	
IV&V Technical Specialist	Baseline (7 months)	280 hours
	Option Year 1 (12 months)	500 hours
	Option Year 2 (12 months)	500 hours
	Option Year 3 (12 months)	500 hours
	Total Hours = 1,780 hours	
Information Technician	Baseline (7 months)	280 hours
	Option Year 1 (12 months)	500 hours

	Option Year 2     none Option Year 3     none Total Hours = 780 hours
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