Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy											Date: February 2018	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 Program Element (Number/Name) PE 0603542N *I Radiological Control*							
COST ($ in Millions)	**Prior Years**	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**Cost To Complete**	**Total Cost**
Total Program Element	4.441	0.677	0.745	0.740	-	0.740	0.746	0.760	0.776	0.794	Continuing	Continuing
1830: *RADIAC Development*	4.441	0.677	0.745	0.740	-	0.740	0.746	0.760	0.776	0.794	Continuing	Continuing

A. Mission Description and Budget Item Justification

Mission Description: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure ionizing radiation. These instruments are used on all Navy, Coast Guard and Military Sealift Command vessels, and at every Navy shore installation, in order to ensure the safety of personnel, continuity of operations in radiological contingencies, and protection of the environment.

Justification: Title 10 of the Code of Federal Regulations, Part 20 (10 CFR 20) requires RADIAC instruments be used to ensure the safety of personnel who work with or are exposed to radioactive materials in their jobs. Additionally, the Navy's mission requires personnel and ships to have the ability to operate in radiological environments and the ability to identify and interdict radiological Weapons of Mass Destruction (WMD). Navy programs that require RADIAC instruments for Occupational Safety & Health (OSH) reasons under the provisions of 10 CFR 20 include Naval Nuclear Propulsion, Nuclear Weapons, Medical, and Radiological Affairs Support. Non-OSH programs include Radiological Defense, Consequence Management, Training, Technical (RADIAC calibration, shielding evaluation, research, etc.) and Radiological Search (maritime interdiction and radiological search missions to locate or intercept WMD).

This budget item develops, tests and evaluates new, highly reliable, more easily calibrated, easy to care and maintain, light weight and modern RADIAC instruments in order to improve the effectiveness of radiation safety, to make instruments simpler to use, and to reduce life cycle costs. The ultimate goal is to replace old, bulky, costly to maintain and repair, unreliable and obsolete instrumentation with multifunction equipment that can be automatically calibrated at greatly reduced cost.

This budget item also provides for improvement to nuclear weapons intrinsic radiation (gamma and neutron) shielding calculations, mixed field (neutron and gamma) dosimetry, and in neutron measurement. The objective is to develop less costly and more effective integral shielding for better personnel protection and safety. Improvement in personnel dosimetry and neutron measurement is also a major emphasis.

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy					Date: February 2018
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*		R-1 Program Element (Number/Name) PE 0603542N *I Radiological Control*			
B. Program Change Summary ($ in Millions)	**FY 2017**	**FY 2018**	**FY 2019 Base**	**FY 2019 OCO**	**FY 2019 Total**
Previous President's Budget	0.702	0.745	0.762	-	0.762
Current President's Budget	0.677	0.745	0.740	-	0.740
Total Adjustments	-0.025	0.000	-0.022	-	-0.022
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.025	0.000			
• Program Adjustments	0.000	0.000	-0.002	-	-0.002
• Rate/Misc Adjustments	0.000	0.000	-0.020	-	-0.020

Change Summary Explanation

The FY 2019 funding request was reduced by $0.002 million to reflect the Department of Navy's effort to support the Office of Management and Budget directed reforms for Efficiency and Effectiveness that include a lean, accountable, more efficient government.

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy			Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603542N / *Radiological Control*	Project (Number/Name) 1830 / *RADIAC Development*	

COST ($ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
1830: *RADIAC Development*	4.441	0.677	0.745	0.740	-	0.740	0.746	0.760	0.776	0.794	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Mission: The Radiation Detection, Indication and Computation (RADIAC) Program is responsible for providing radiation monitoring instruments that detect and measure radiation in accordance with the provisions of Title 10 of the Code of Federal Regulations (10 CFR). These instruments are used on all vessels afloat and at every shore installation in order to ensure the safety of personnel and the environment. RADIACs are also required after an act of terrorism or war that involves nuclear material in order to enable continuing warfighting ability.

Justification: Many RADIAC instruments and dosimetry systems are decades old and approaching the end of their useful lives. In some cases the equipment and replacement parts are no longer manufactured, making the equipment logistically unsupportable. In other cases increasing failure rates due to age make replacements an economic efficiency
improvement. In all cases a technology refresh will make both economic sense in terms of lowering the total ownership costs, and will also provide increased operational capabilities.

Naval Nuclear Propulsion Program (NNPP): Instruments are developed to support the safe operation and maintenance of nuclear powered vessels and at nuclear maintenance facilities.

Non-NNPP: Instruments are developed to support other than NNPP end users, such as Explosive Ordnance Disposal, Nuclear Weapons, Medical, Industrial Radiography, Radiological Defense and Training.

Visit, Board, Search & Seizure (VBSS): The Navy has been tasked to intercept and board vessels at sea to search for nuclear or radiological materials that could be used for terrorist attacks. These instruments would have different characteristics than those used for NNPP and non-NNPP purposes and prototypes must be developed and/or tested and evaluated.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Radiological Shipboard Defense Monitor	0.080	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
Description: All surface combatants require an instrument to detect and measure radiological activity in the event of a nuclear detonation in order for the ship to avoid the radiological danger and continue its mission. The AN/PDR-65, at over 40 years of age, was the instrument used for this purpose, but it is obsolete and has been de-fielded. An interim replacement has been fielded while OPNAV finalizes updating the Cold War requirements					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
under which the AN/PDR-65 was designed in order to include radiological (terrorist "dirty bomb") threats. The interim replacement is the IM-265 Survey Meter, which is already in the Navy inventory, but was not designed for this requirement and cannot measure radiation external to the ship and is therefore not suitable as the permanent replacement. ***FY 2018 Plans:*** N/A ***FY 2019 Base Plans:*** N/A ***FY 2019 OCO Plans:*** N/A					
Title: Primary Dosimetry ***Articles:***	0.280 1	0.172 1	0.179 -	0.000 -	0.179 -
Description: The need for primary dosimetry is inherent due to the Navy's operation of nuclear reactors and their emission of ionizing radiation. Title 10 of the Code of Federal Regulations, Part 20.1502, states "Each licensee shall monitor exposures to radiation and radioactive material at levels sufficient to demonstrate compliance with the occupational dose limits." A primary dosimeter must pass accreditation proficiency testing, allowing the reading obtained to become a part of an individual's permanent health record. This permanent record is used to protect the individual radiation worker's health, and also the Navy from future liability. The Navy's current primary device is the DT-702/PD, a Thermo Luminescence Dosimeter (TLD). Existing TLD and newer technologies, such as Optically Stimulated Luminescence (OSL), must be continually researched to determine on-going performance parameters, cost to field and cost to maintain. ***FY 2018 Plans:*** NSWCCD and NDC will complete reporting on the pilot study with BeO dosimetry. Additionally, NSWCCD will perform environmental testing, guided by the ANSI N13.11 requirements for normal environmental conditions, on both OSL systems. When all tests are complete, NSWCCD and NDC will submit a comprehensive Technical Report on both OSL systems to SEA 04ND. NSWCCD will also remain up to date on advances of the BeO system and submit a contract package for the FY18 procurement of BeO neutron dosimeters. Finally, NSWCCD will utilize the Freiberg Lexsyg reserach imaging TL-OSL-RF system to characterize existing and future primary					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
dosimeters' luminescent properties to ensure quality and check material weakness prior to adopting these systems into the US Navy. Findings will be summarized in a Technical Memorandum to SEA 04ND. ***FY 2019 Base Plans:*** NSWCCD will submit a test plan to Naval Sea Systems Command (NAVSEA 04ND) and perform American National Standards Institute (ANSI) N13.11 standard proficiency testing, including neutron radiation tests, on the neutron-capable Beryllium Oxide (BeO) Optically-Stimulated Luminescence (OSL) dosimeters acquired in FY18. NSWCCD will submit the results from the radiological testing to NAVSEA 04ND in a Technical Memorandum. NSWCCD will also continue market research for test and evaluation of new or improved technology applicable to primary dosimetry. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** No significant change.					
Title: Secondary Dosimetry ***Articles:*** ***Description:*** A secondary dosimeter provides an accurate, real-time readout of the radiation exposure being obtained in operational environments, and is utilized in conjunction with a primary dosimeter. The primary dosimeter does not provide real-time exposure information, so the secondary dosimeter is worn for that purpose. The Navy's secondary dosimeter is the Mk2 Electronic Personal Dosimeter (EPD). Research is required to find a secondary dosimeter that can measure the type of radiation encountered with pulsed X-ray machines, and to see if this new capability can be incorporated into one device. ***FY 2018 Plans:*** NSWCCD will continue analyzing Navy user feedback and desired specifications on current pulsed X-ray and electronic dosimetry. Additional market research and testing will be performed as appropriate. NSWCCD will continue analyzing Navy requirements and desired specifications for extremity/lens dosimetry. Testing for the FY17 purchase of extremity dosimetry and criticality dosimetry units will be performed. NSWCCD will submit a Test Plan to SEA 04ND for approval. Additional market research and testing may be performed as appropriate. NSWCCD will submit a Technical Memorandum to SEA 04ND updating commercial capabilities and evaluations with respect to Navy requirements. ***FY 2019 Base Plans:***	0.167 3	0.125 -	0.145 -	0.000 -	0.145 -

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
NSWCCD will continue to remain abreast of the latest advances in electronic dosimetry, both from radiological and logistical perspectives. NSWCCD will assist the SEA 04ND In Service Engineering Agent in the analysis of the logistics necessary to support a new electronic dosimetry system, considering that the Navy's current instrument will go out of production in FY22, necessitating the beginning of a search for a replacement with the possibility it will include enhanced capabilities. NSWCCD will complete investigation into the logistics infrastructure capabilities of new systems and provide an assessment in a Technical Memorandum to Naval Sea Systems Command (NAVSEA 04ND) detailing the areas of improvement possible for the Navy's system. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Inflation and additional test and evaluation man hours.					
Title: Radiological Detection System	0.110	0.150	0.161	0.000	0.161
Articles:	-	-	3	-	3
Description: The Radiological Detection System (RDS) is a survey meter and its associated probes (alpha, beta, gamma, and neutron) used in a wide variety of applications, and the necessary ancillary equipment such as cases, cables and technical manuals. This type of survey meter system is the single most prevalent RADIAC instrument in the Navy inventory, utilized for every Navy end use but predominantly in the Naval Nuclear Propulsion Program (NNPP) and Radiological Defense (RD) end uses. The Joint Program Executive Office for Chemical, Biological and Nuclear Defense (JPEO-CBND) is currently developing the RDS for use by all the Services. When all the Services agree on a single system, it will lower the procurement cost for all and just as significantly, for the first time enable Joint interoperability in the warfighter's Radiological Defense arena. The Navy's current version of this instrument is the IM-260/PD, which is 30 years old and nearing the end of its useful life. Army and Marine Corps use the AN/PDR-75 system and the Air Force the ADM-300, which are both also decades old and obsolescent. The NNPP end use is unique amongst the Services, and while the RDS solution should prove to be sufficient for all the Services for most of their respective applications, Navy must test and evaluate the proposed RDS to ensure the performance and specifications of a Joint solution will be sufficient to meet the requirements of the NNPP application. ***FY 2018 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
NSWCCD will continue coordinating with JPEO-CBND in RDS related activities. ***FY 2019 Base Plans:*** NSWCCD will purchase three low rate initial production units through JPEO-CBND. The units will undergo radiological testing at NSWCCD to ensure they meet Navy specifications for all applications. Product demonstrations will be provided to Naval Sea Systems Command (NAVSEA 04ND), Office of the Chief of Naval Operations (OPNAV) N45 and N96, and major end users. A summary of test results and end user feedback will be provided in a Technical Memorandum to NAVSEA 04ND and JPEO-CBND to assist in the procurement stage of the RDS project. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Procurement of three test articles.					
Title: Visit, Board, Search & Seizure	0.040	0.043	0.076	0.000	0.076
Articles:	-	6	3	-	3
Description: The Visit, Board, Search & Seizure (VBSS) mission of the Navy includes the requirement to be able to board ships and be able to detect and identify potential radiological or nuclear Weapons of Mass Destruction (WMD). Such a sensitive mission requires leading edge technology and capabilities to ensure success. The AN/PDX-1 RADIAC Set was fielded in response to a Joint Urgent Operational Needs Statement to meet this requirement. It contains three instruments that serve different purposes: (1) a Handheld Radiation Monitor (HRM)that searches for radiological materials; (2) a Radioisotope Identifier (RID) that identifies the type of radiological material located; and (3) a Personal Radiation Detector (PRD) that displays the radiological dose the VBSS team members may be receiving so that they can be aware if they are being exposed to dangerous levels of radioactivity during the mission. Current technology dictates that the sensitivity of the detectors is directly proportional to the size of the detector element; i.e., the larger the detector, the more sensitive and capable it is. However, in VBSS there must be a tradeoff between size/weight and capability, since it is difficult and hazardous for boarding parties to carry a backpack-sized detector, along with their weapons and other gear, up a rope ladder to board a vessel on the high seas. This will be a continuing effort to find smaller, lighter instruments with enhanced sensitivity, reach-back capability, and other enhancements to provide the Navy the best and most cost effective equipment possible for this critical mission. ***FY 2018 Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
NSWCCD will purchase new PRDs and HRMs for test and evaluation. The Test Plan developed in FY17 will be finalized and submitted to SEA 04ND, so that evaluation of new units can begin upon delivery. NSWCCD will complete test and evaluation of the commercial units, summarize the results and submit the findings in a Technical Report to SEA 04ND. Simultaneously, NSWCCD will internally review all VBSS RID Technical Report data to date, so as to analyze development of the technology over time. Recurring issues and other trends will be noted in order to create a more detailed plan for the next round of test and evaluation. Additional test data from other sources, such as the Defense Threat Reduction Agency (DTRA), will be researched to aid in developing the next Test Plan. NSWCCD will also perform market research into new commercial RID products and capabilities by surveying industry and other technical contacts. NSWCCD will then develop a specification for the next purchase of RIDs and prepare a procurement package for FY19 solicitation. ***FY 2019 Base Plans:*** NSWCCD will solicit and award contracts to buy three new commercial Radioisotope Identifiers (RIDs). The test plan developed in FY18 will be finalized and submitted to Naval Sea Systems Command (NAVSEA 04ND) for approval in order that evaluation of the new RIDs can begin upon delivery. NSWCCD will complete test and evaluation of the RIDs, summarize the results and submit the findings in a Technical Report to NAVSEA 04ND. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Procurement of three test articles.					
Title: Telescoping Rate Meter	0.000	0.255	0.179	0.000	0.179
Articles:	-	5	-	-	-
Description: Telescoping rate meters play a vital role in the practice of radiation safety in the Naval Nuclear Propulsion Program. The detector is attached to the end of an extendable, telescoping pole, thus allowing the operator to maintain a safe distance from high exposure areas. This allows the Navy to comply with federal regulations, which mandate that radioactive doses received by operators be As Low As Reasonably Achievable (ALARA). The current instrument is 30 years old and approaching obsolescence due to the unavailability of repair parts. ***FY 2018 Plans:*** NSWCCD will perform market research into commercial versions of this instrument as used in commercial nuclear power applications. Published specifications wil be compared against the performance of the Navy's					

Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
current IM-260. End-user feedback regarding desired performance will be collected. NSWCCD will prepare and submit a contract package for the procurement of several telescoping rate meter units for evaluation. ***FY 2019 Base Plans:*** NSWCCD will submit a test plan to Naval Sea Systems Command (NAVSEA 04ND) and upon its approval complete testing on the telescoping rate meter units that were procured in FY18. The test results and their applicability to US Navy requirements will be summarized in a Technical Memorandum to NAVSEA 04ND. ***FY 2019 OCO Plans:*** N/A ***FY 2018 to FY 2019 Increase/Decrease Statement:*** Test articles procured in FY18 but not in FY19.					
Accomplishments/Planned Programs Subtotals	0.677	0.745	0.740	0.000	0.740

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• OPN 2920: *RADIAC*	8.092	10.718	8.175	-	8.175	8.269	8.344	8.524	8.693	Continuing	Continuing

Remarks

D. Acquisition Strategy

Development efforts are focused on evaluation, modification (as required to meet operational requirements) and adaptation of commercial-off-the-shelf (COTS) technology in order to minimize total ownership costs. To the maximum extent possible new contracts are targeted for fixed price efforts to control development cost.

E. Performance Metrics

Program Reviews

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603542N / *Radiological Control*	Project (Number/Name) 1830 / *RADIAC Development*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Evaluation	WR	NSWCCD : West Bethesda, MD	4.201	0.350	Nov 2016	0.639	Nov 2017	0.614	Nov 2018	-		0.614	Continuing	Continuing	Continuing
Primary Dosimetry	C/FFP	NSWCCD : West Bethesda, MD	0.100	0.185	Aug 2017	0.003	May 2018	0.000		-		0.000	0.000	0.288	0.288
Secondary Dosimetry	C/FFP	NSWCCD : West Bethesda, MD	0.020	0.142	Aug 2017	0.000		0.000		-		0.000	0.000	0.162	0.162
VBSS	C/FFP	NSWCCD : West Bethesda, MD	0.120	0.000		0.063	Jun 2018	0.063	Jun 2019	-		0.063	0.000	0.246	0.246
Telescoping Rate Meter	C/FFP	NSWCCD : West Bethesda, MD	0.000	0.000		0.040	Jul 2018	0.000		-		0.000	0.000	0.040	0.040
Radiological Detection System	C/FFP	NSWCCD : West Bethesda, MD	0.000	0.000		0.000		0.063	Sep 2019	-		0.063	0.000	0.063	0.063
		Subtotal	4.441	0.677		0.745		0.740		-		0.740	Continuing	Continuing	N/A

	Prior Years	FY 2017 Cost	FY 2017 Award Date	FY 2018 Cost	FY 2018 Award Date	FY 2019 Base Cost	FY 2019 Base Award Date	FY 2019 OCO Cost	FY 2019 OCO Award Date	FY 2019 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.441	0.677		0.745		0.740		-		0.740	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

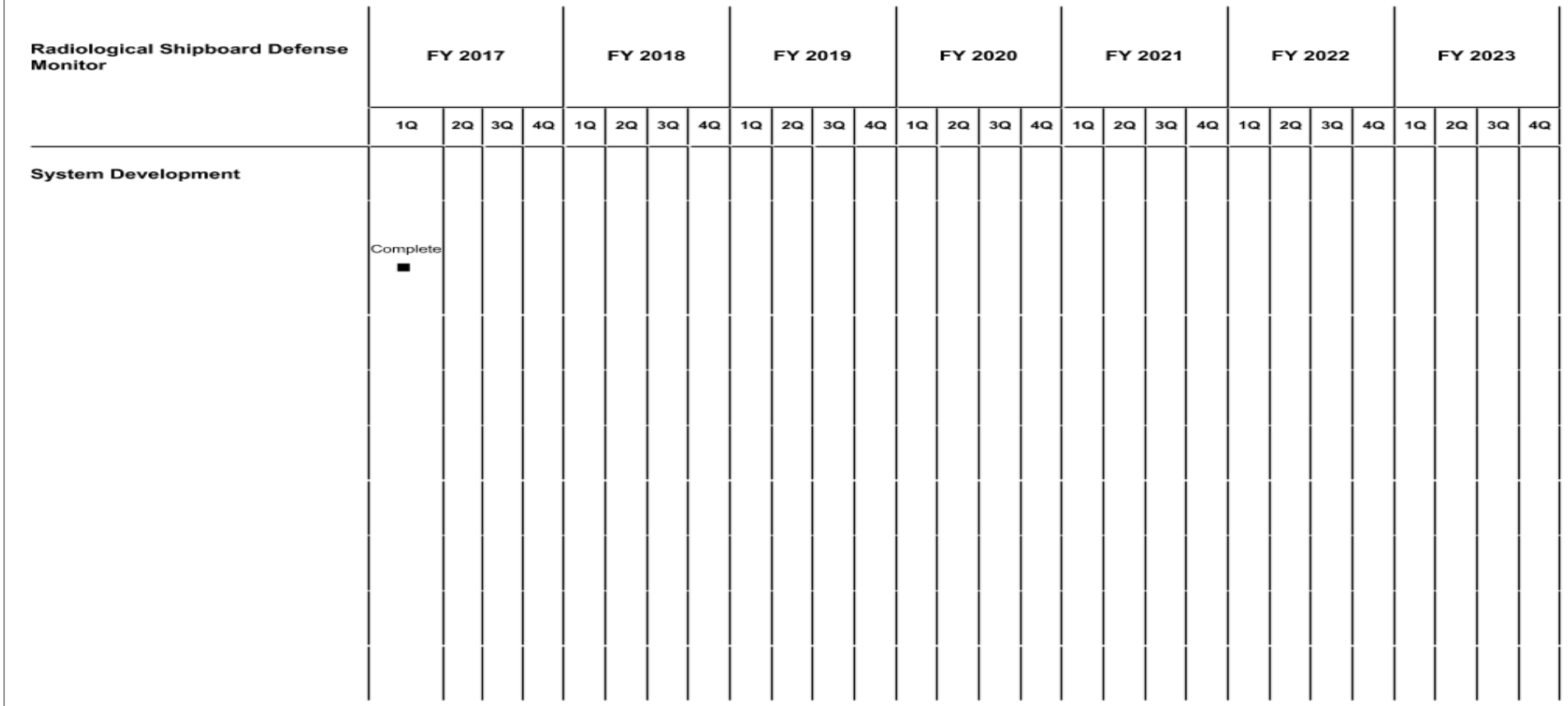

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

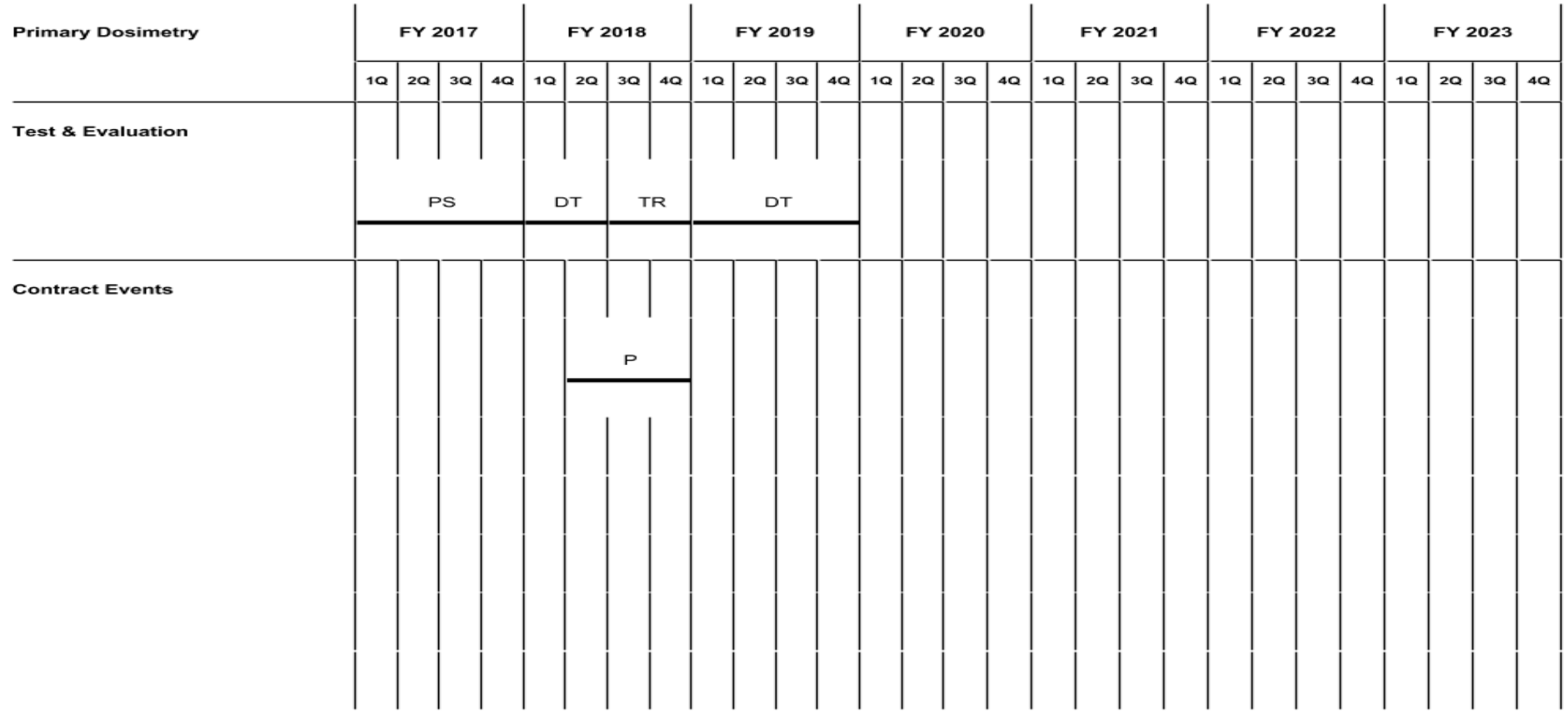

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

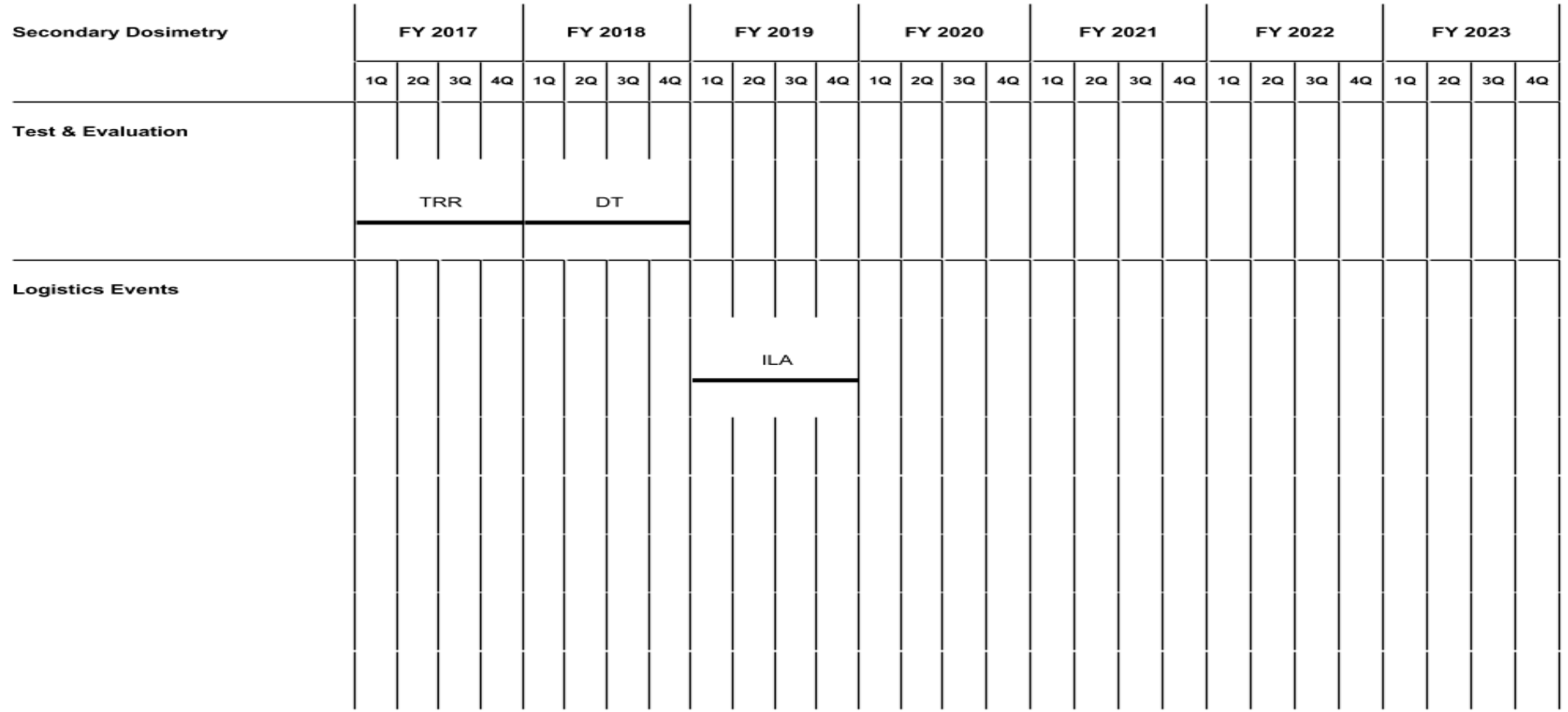

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

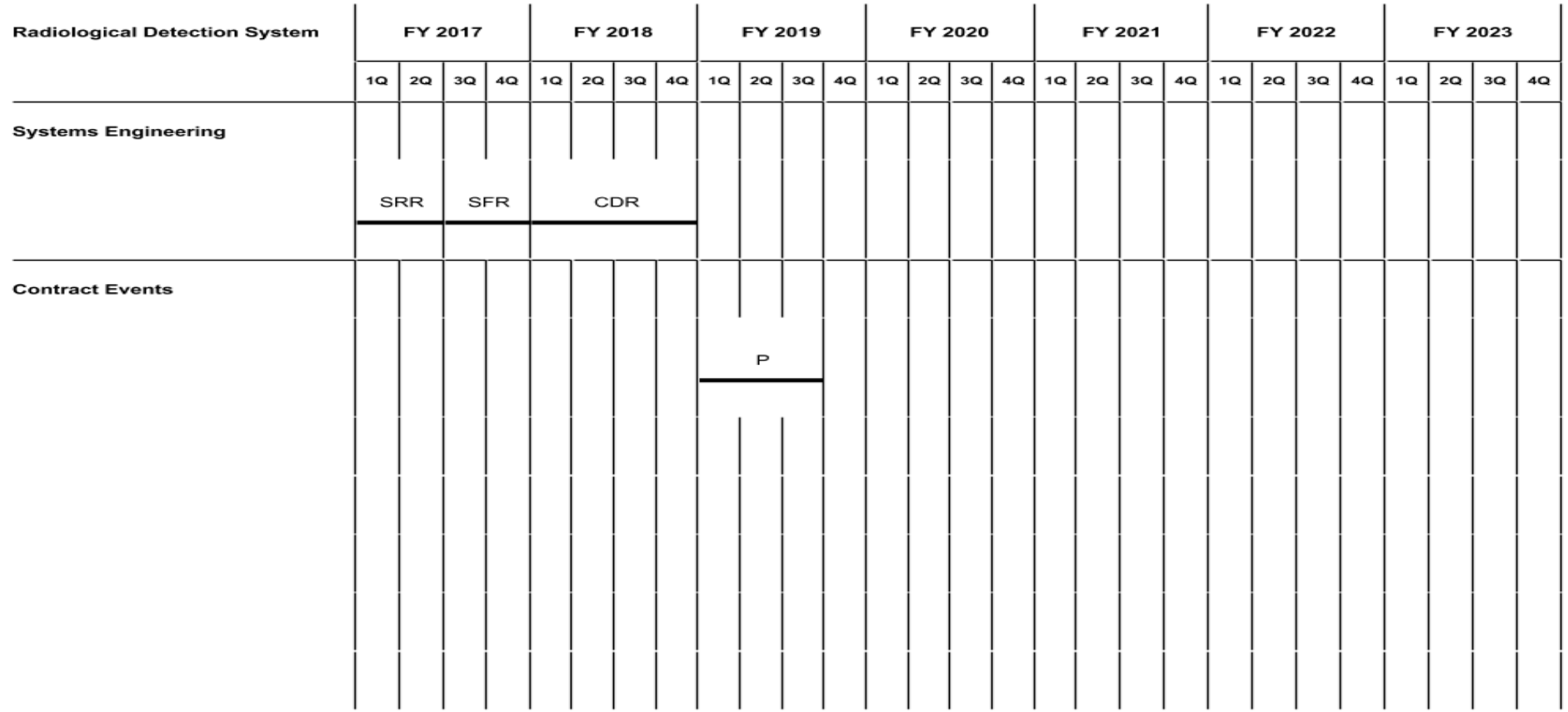

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

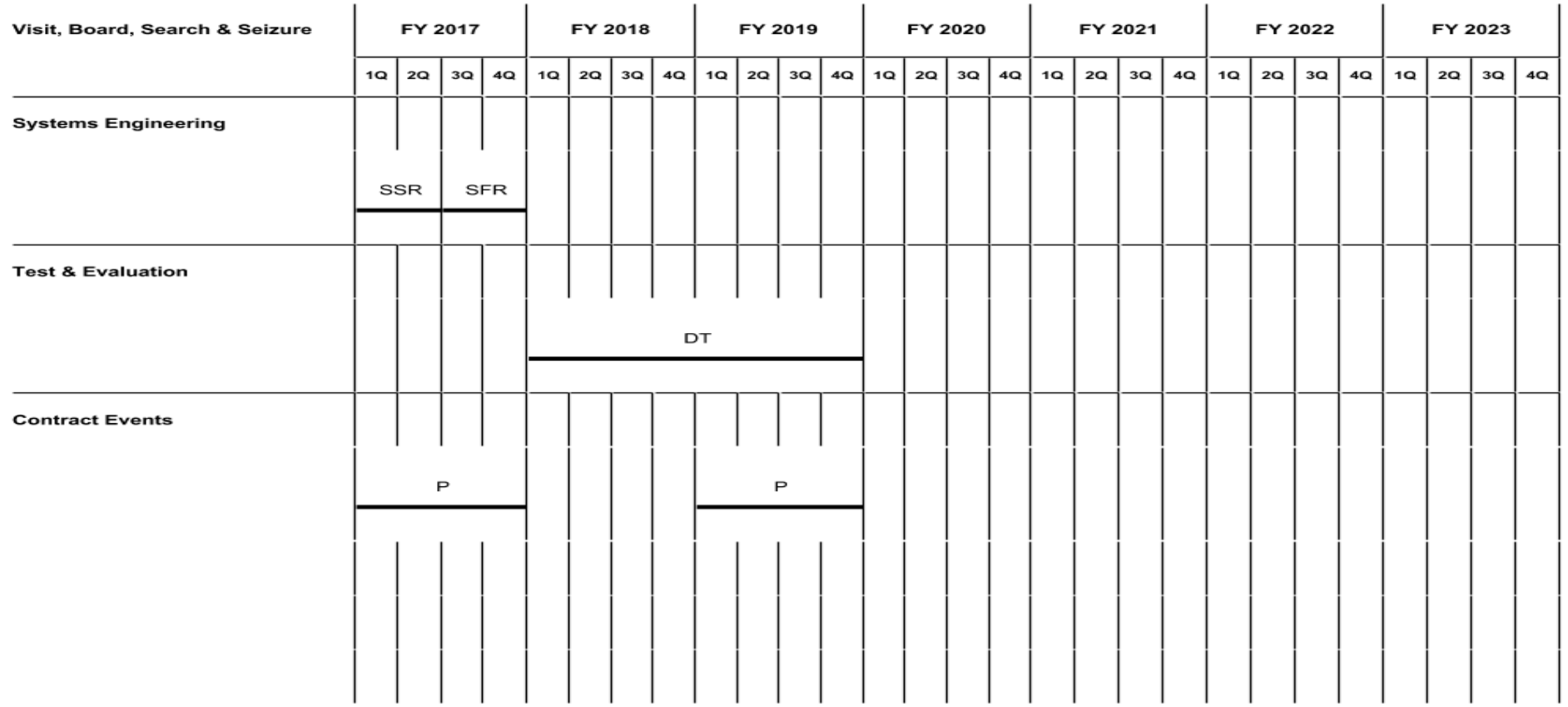

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

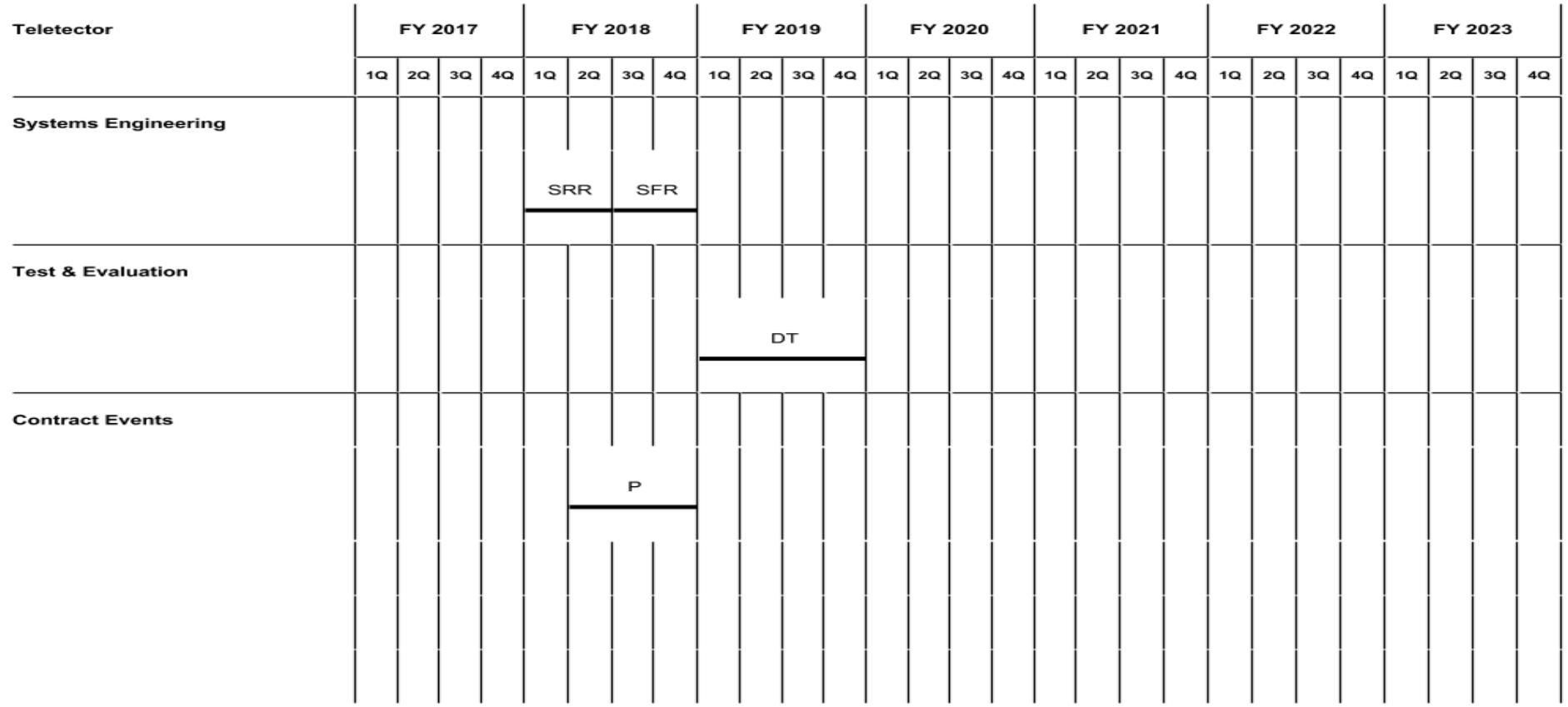

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Radiological Shipboard Defense Monitor				
System Development: Complete	1	2017	1	2017
Primary Dosimetry				
Test & Evaluation: Pilot Study of Beryllium Oxide (BeO) Dosimetry	1	2017	4	2017
Test & Evaluation: Environmental Testing of BeO Dosimetry	1	2018	2	2018
Test & Evaluation: Technical Report on Optically Stimulated Luminescence Dosimetery	3	2018	4	2018
Test & Evaluation: Proficiency Testing of Neutorn Capable Dosimeters	1	2019	4	2019
Contract Events: Procure Neutron Capable Dosimeters	2	2018	4	2018
Secondary Dosimetry				
Test & Evaluation: Test Readiness Review and Data Compilation	1	2017	4	2017
Test & Evaluation: Pulsed X-ray and Electronic Dosimetry	1	2018	4	2018
Logistics Events: Integrated Logistics Analysis	1	2019	4	2019
Radiological Detection System				
Systems Engineering: System Requirements Review	1	2017	2	2017
Systems Engineering: System Functional Review	3	2017	4	2017
Systems Engineering: Critical Design Review	1	2018	4	2018
Contract Events: Procure LRIP Units	1	2019	3	2019
Visit, Board, Search & Seizure				
Systems Engineering: System Requirements Review	1	2017	2	2017
Systems Engineering: System Functional Review	3	2017	4	2017
Test & Evaluation: Developmental Test & Evaluation	1	2018	4	2019
Contract Events: Procure PRD and HRM Test Units	1	2017	4	2017
Contract Events: Procure RID Test Units	1	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Navy		Date: February 2018
Appropriation/Budget Activity 1319 / 4	**R-1 Program Element (Number/Name)** PE 0603542N / *Radiological Control*	**Project (Number/Name)** 1830 / *RADIAC Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Teletector				
Systems Engineering: System Requirements Review	1	2018	2	2018
Systems Engineering: System Functional Review	3	2018	4	2018
Test & Evaluation: Developmental Test & Evaluation	1	2019	4	2019
Contract Events: Procure Test Units	2	2018	4	2018