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| Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Navy  |             |         |         |              |   |               |         |         |         | Date: February 2018 |                  |            |
|---|-------------|---------|---------|--------------|---|---------------|---------|---------|---------|---------------------|------------------|------------|
| Appropriation/Budget Activity<br>1319: Research, Development, Test & Evaluation, Navy I BA 4: Advanced Component Development & Prototypes (ACD&P)   |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0604112N I (U)Gerald R Ford CI Nuc Aircraft Carrier CVN 78-80 |               |         |         |         |                     |                  |            |
| 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   | 146.976     | 69.185  | 83.935  | 58.121       | -   | 58.121        | 57.236  | 43.713  | 30.904  | 39.306              | Continuing       | Continuing |
| 2208: CVN 21  | 123.465     | 32.398  | 57.946  | 25.029       | -   | 25.029        | 39.759  | 26.236  | 26.704  | 39.306              | Continuing       | Continuing |
| 4004: EMALS   | 23.511      | 36.787  | 25.989  | 33.092       | -   | 33.092        | 17.477  | 17.477  | 4.200   | 0.000               | 0.000            | 158.533    |
| Program MDAP/MAIS Code:<br>Project MDAP/MAIS Code(s): 223   |             |         |         |              |   |               |         |         |         |                     |                  |            |
| <b>A. Mission Description and Budget Item Justification</b><br>The FY 2019 funding request was reduced by \$.094 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.<br><br>This Navy program addresses unique technologies on Ford Class carriers. The program includes:<br><br>- (2208) - Development of ship hull, mechanical, propulsion, electrical, aviation, and combat support systems, subsystems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities, and to meet the requirements of existing and pending regulations and statutes critical to the operation of existing and future aircraft carriers.<br><br>- (4004) - Development of an advanced technology aircraft launch system in support of the CVN 78 Class design and construction schedule. The Electro Magnetic Aircraft Launch System (EMALS) will replace the current steam catapult on CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability and reduced operator and maintainer workload.<br><br>This Program Element (PE) and associated projects represent a continuation of efforts previously funded under PE 0603512N projects 2208 and 4004 in FY 2014 and earlier. |             |         |         |              |   |               |         |         |         |                     |                  |            |

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| B. Program Change Summary (\$ in Millions)  | FY 2017 | FY 2018   | FY 2019 Base | FY 2019 OCO         | FY 2019 Total |
| Previous President's Budget   | 70.528  | 83.935  | 84.195       | -                   | 84.195        |
| Current President's Budget  | 69.185  | 83.935  | 58.121       | -                   | 58.121        |
| Total Adjustments   | -1.343  | 0.000   | -26.074      | -                   | -26.074       |
| • Congressional General Reductions  | -       | -   |              |                     |               |
| • Congressional Directed Reductions   | -       | -   |              |                     |               |
| • Congressional Rescissions   | -       | -   |              |                     |               |
| • Congressional Adds  | -       | -   |              |                     |               |
| • Congressional Directed Transfers  | -       | -   |              |                     |               |
| • Reprogrammings  | -       | -   |              |                     |               |
| • SBIR/STTR Transfer  | -1.344  | 0.000   |              |                     |               |
| • Program Adjustments   | 0.000   | 0.000   | -25.394      | -                   | -25.394       |
| • Rate/Misc Adjustments   | 0.001   | 0.000   | -0.680       | -                   | -0.680        |
| Change Summary Explanation  |         |   |              |                     |               |
| FY19 - PROJ 2208 CVN 21: Removal of Full Ship Shock Trial (FSST) funding (-\$42.5M)   |         |   |              |                     |               |
| FY19 - PROJ 4004 CVN 21: Addition of EMALS depot planning funding (+\$17.2M)  |         |   |              |                     |               |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Navy  |                    |                |                |                     |   |                      |                |                |   | <b>Date:</b> February 2018 |                         |                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4  |                    |                |                |                     | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |                      |                |                | <b>Project (Number/Name)</b><br>2208 / CVN 21 |                            |                         |                   |
| <b>COST (\$ in Millions)</b>  | <b>Prior Years</b> | <b>FY 2017</b> | <b>FY 2018</b> | <b>FY 2019 Base</b> | <b>FY 2019 OCO</b>  | <b>FY 2019 Total</b> | <b>FY 2020</b> | <b>FY 2021</b> | <b>FY 2022</b>                                | <b>FY 2023</b>             | <b>Cost To Complete</b> | <b>Total Cost</b> |
| 2208: CVN 21  | 123.465            | 32.398         | 57.946         | 25.029              | -   | 25.029               | 39.759         | 26.236         | 26.704  | 39.306                     | Continuing              | Continuing        |
| Quantity of RDT&E Articles  |                    | -              | -              | -                   | -   | -                    | -              | -              | -   | -                          |                         |                   |
| <b>Project MDAP/MAIS Code:</b> 223  |                    |                |                |                     |   |                      |                |                |   |                            |                         |                   |
| <b>A. Mission Description and Budget Item Justification</b><br><p>This project provides for the development of aircraft carrier specific technologies, the infusion of the ship technology base into existing and future aircraft carriers, and the potential realization of subsystem design capabilities not currently feasible. This project transitions the most promising technologies from the Navy technology base, other government laboratories, and the private sector into specific advanced development efforts. All systems developed in this project have the potential to support emerging requirements and other promising systems technologies for insertion into new aircraft carrier designs. The emphasis is directed toward developing ship hull, mechanical, propulsion, electrical, aviation, warfare systems, and combat support systems, sub-systems and components to significantly improve aircraft carrier affordability, manpower requirements, survivability, and operational capabilities and to meet the requirements of existing and pending regulations and statutes critical to the operation of future aircraft carriers. This project also encompasses those tasks required to support CVN 78 procurement, including, but not limited to engineering support, programmatic and program support, logistics support, modeling and simulation, test and evaluation, manpower and program related studies, and design support systems, such as the Integrated Digital Environment (IDE).</p> |                    |                |                |                     |   |                      |                |                |   |                            |                         |                   |
| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>   |                    |                |                |                     |   |                      | <b>FY 2017</b> | <b>FY 2018</b> | <b>FY 2019 Base</b>                           | <b>FY 2019 OCO</b>         | <b>FY 2019 Total</b>    |                   |
| <b>Title:</b> CVN 78 Class Advanced Technology Design & Development   |                    |                |                |                     |   |                      | 7.455          | 31.374         | 11.597  | 0.000                      | 11.597                  |                   |
| <b>Articles:</b>  |                    |                |                |                     |   |                      | -              | -              | -   | -                          | -                       |                   |
| <b>Description:</b> CVN 78 Class Advanced Technology Design & Development - Continue development and transition of technologies to support CVN 78 Class Key Performance Parameters (KPPs): maintain sortie generation rate, reductions in manpower, and further recovery of weight and stability service life margins. Continue design activities to integrate the new technologies, such as the new propulsion plant and Electromagnetic Aircraft Launch System into the ship. Complete shock qualification for components of all CVN 78 systems.  |                    |                |                |                     |   |                      |                |                |   |                            |                         |                   |
| <b>FY 2018 Plans:</b><br>Cyber-security: Continue developing CVN 78 cyber-security processes, requirements and solutions. Establish boundary defense for tactical, wire-free communication and video systems. Develop and maintain certification and accreditation packages for system support. Develop land-based test sites to conduct testing.   |                    |                |                |                     |   |                      |                |                |   |                            |                         |                   |

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| Appropriation/Budget Activity<br>1319 / 4   |  | R-1 Program Element (Number/Name)<br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |                     | Project (Number/Name)<br>2208 / CVN 21 |         |              |             |               |
| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)  |  |  |                     | FY 2017                                | FY 2018 | FY 2019 Base | FY 2019 OCO | FY 2019 Total |
| <p>Component Shock: Complete CVN 78 Government-Furnished Equipment (GFE) component / system shock qualification requirements. This effort will allow necessary NAVSEA post-delivery shock hardening certification of CVN 78 prior to its operational deployment.</p> <p>The increase from FY2017 to FY2018 is due to the requirement for component shock qualification testing. Raytheon will be performing shock qualification testing of Dual Band Radar (DBR). NSWC Philadelphia will have an increased workload with significant shock test report review, test procedure review and test preparation assistance. SPAWAR is continuing its shock test efforts, with all testing to be completed by 4Q2018. Major systems to be component shock qualified are Navy Multiband Terminal (NMT), Digital Modular Radio (DMR), Tactical Variant Switch (TVS), Consolidated Afloat Network Enterprise Services (CANES) Video, Radio Communication System (RCS), Automated Digital Network System (ADNS), and Communications Data Link System (CDLS). There are also increasing requirements from Integrated Warfare Systems that are required for Ship's Self Defense System (SSDS) and Guided Missile Launching System (GMLS) for qualification.</p> <p><b>FY 2019 Base Plans:</b><br/>Continue providing support to resolve issues identified during Post Shakedown Availability (PSA) on CVN 78 developmental systems.</p> <p>Cyber-security: Continue developing CVN 78 cyber-security processes, requirements and solutions. Establish boundary defense for tactical, wire-free communication and video systems. Develop and maintain certification and accreditation packages for system support. Develop land-based test sites to conduct testing. Continue to implement WIN10 upgrades, development of connect / disconnect procedures as well as continue to develop Security Technical Implementation Guides and Information Assurance Technical Authority Board in time for installation during the FY 2020 Planned Incremental Availability.</p> <p>Component Shock: Complete CVN 78 GFE component / system shock qualification requirements. This effort will allow necessary NAVSEA post-delivery shock hardening certification of CVN 78 prior to its operational deployment.</p> |  |  |                     |  |         |              |             |               |
|   |  |  |                     |  |         |              |             |               |
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| Appropriation/Budget Activity<br>1319 / 4   |  | R-1 Program Element (Number/Name)<br>PE 0604112N I (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |             | Project (Number/Name)<br>2208 I CVN 21 |                |                  |
| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)  |  | FY 2017  | FY 2018     | FY 2019<br>Base                        | FY 2019<br>OCO | FY 2019<br>Total |
| Requirements in FY19 are for Raytheon to prepare and perform component shock testing of DBR elements, to include AN/SPY-4, AN/SPY-3, Receiver Exciter (REX), and processing rooms. NSWC Philadelphia will complete review of GFE shock test reports carried over from 4Q 2018 shock testing, provide guidance and approval for DBR test procedures, and review resulting DBR shock test reports.<br><br><b>FY 2019 OCO Plans:</b><br>N/A<br><br><b>FY 2018 to FY 2019 Increase/Decrease Statement:</b><br>Decrease due to removal of Full Ship Shock Trials.  |  |  |             |  |                |                  |
| <b>Title:</b> CVN 21 - Test & Evaluation (T&E)<br><br><b>Articles:</b>  |  | 24.943<br>-  | 26.572<br>- | 13.432<br>-                            | 0.000<br>-     | 13.432<br>-      |
| <b>FY 2018 Plans:</b><br>Continue Post Delivery Tests and Trials (PDT&T), Developmental Test Working Group (DTWG) and CVN 78 Integrated Test Team (CITT) efforts in support of Developmental Test / Integrated Test Phase 4 (DT/IT-4) completion. Perform oversight of FY 18 PDT&T and DT/IT-4 test event integration to address Developmental Test (DT) and Operational Test (OT) requirements. Major FY 18 PDT&T and DT/IT-4 test events include: (1) continued Combat Systems Shipboard Developmental Testing (CS SBDT) efforts; (2) continued cyber-security inspections and aircraft compatibility testing; (3) continued Special Performance Trials and Acoustic Trials and (4) completion of the development of the Sea-strike Sea-basing Aviation Model (SSAM) and data collection in support of model validation.<br><br>Continue PDT&T, DTWG, and CITT planning efforts in support of post-PSA DT/IT-5 integration testing and preparations for Initial Operational Test and Evaluation (IOT&E). Major post-PSA DT/IT-5 test events include: (1) obtaining post-PSA Platform (Afloat Site) (Interim) Authority to Operate (IATO / ATO) and post-PSA flight deck certification; (2) continuing to conduct CS SBDT, Radar Cross Section and Infrared measurements, degaussing and de-perming, cyber-security inspections, and aircraft compatibility testing; and (3) continuing to conduct Combat System Ship Qualification Trial (CSSQT).<br><br><b>FY 2019 Base Plans:</b><br>Complete PSA and achieve Initial Operational Capability (IOC). Continue PDT&T, DTWG and CITT efforts in support of DT/IT-5 integration testing. Continue DT/IT-5. The test events scheduled for DT/IT-5 in FY 19 include continuing DBR shipboard engineering and developmental testing; platform-level combat systems |  |  |             |  |                |                  |

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| <b>Appropriation/Budget Activity</b><br>1319 / 4   |                |                |                         | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |                          |                |                | <b>Project (Number/Name)</b><br>2208 / CVN 21 |                        |                             |                   |
| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>  |                |                |                         |   |                          |                |                |   |                        |                             |                   |
|  |                |                |                         |   |                          | <b>FY 2017</b> | <b>FY 2018</b> | <b>FY 2019<br/>Base</b>                       | <b>FY 2019<br/>OCO</b> | <b>FY 2019<br/>Total</b>    |                   |
| interoperability testing; platform-level C4I interoperability testing; CSSQT; structural test firings of Evolved Sea Sparrow Missile (ESSM) and Rolling Airframe Missile (RAM); Radar Cross Section (RCS) and Infrared (IR) measurements; degaussing and de-perming; cyber-security inspection; platform-level Hull, Mechanical and Electrical (HM&E) interoperability testing; platform-level aviation systems interoperability testing; and aircraft compatibility testing. Continue planning of Operational Testing, to include Operational Test Phase C1 (OT-C1) planned testing and begin detailed planning of scheduled OT-C2 test events.<br><br><b>FY 2019 OCO Plans:</b><br>N/A<br><br><b>FY 2018 to FY 2019 Increase/Decrease Statement:</b><br>Decrease due to removal of Full Ship Shock Trials. |                |                |                         |   |                          |                |                |   |                        |                             |                   |
| <b>Accomplishments/Planned Programs Subtotals</b>  |                |                |                         |   |                          | 32.398         | 57.946         | 25.029  | 0.000                  | 25.029                      |                   |
| <b>C. Other Program Funding Summary (\$ in Millions)</b>   |                |                |                         |   |                          |                |                |   |                        |                             |                   |
| <b>Line Item</b>   | <b>FY 2017</b> | <b>FY 2018</b> | <b>FY 2019<br/>Base</b> | <b>FY 2019<br/>OCO</b>  | <b>FY 2019<br/>Total</b> | <b>FY 2020</b> | <b>FY 2021</b> | <b>FY 2022</b>                                | <b>FY 2023</b>         | <b>Cost To<br/>Complete</b> | <b>Total Cost</b> |
| • RDTEN / 0604567N: Project Units 3108, 3179, 4007   | 68.892         | 54.131         | 50.110                  | -   | 50.110                   | 46.566         | 45.327         | 46.226  | 47.200                 | Continuing                  | Continuing        |
| • SCN / 2001: Carrier Replacement Program  | 2,626.567      | 4,441.772      | 1,598.181               | -   | 1,598.181                | 2,146.535      | 3,239.606      | 2,910.491                                     | 3,378.355              | 10,602.689                  | 50,900.224        |
| • SCN / 5300: Completion of Prior Year Shipbuilding Programs   | 0.000          | 20.000         | 0.000                   | -   | 0.000                    | 0.000          | 0.000          | 0.000   | 0.000                  | 0.000                       | 1,394.860         |
| • OMN / 1B2B: CVN 78 Ford Class Training and Sustainment (12BJ0)   | 17.536         | 14.008         | 9.043                   | -   | 9.043                    | 8.150          | 6.346          | 6.907   | 7.054                  | Continuing                  | Continuing        |
| • OPN / 5664: Surface Training Equipment   | 4.490          | 12.010         | 7.942                   | -   | 7.942                    | 0.994          | 4.965          | 2.964   | 3.023                  | Continuing                  | Continuing        |
| • OMN / 1B1B: Mission and Other Ship Operations (11B30)  | 24.000         | 0.000          | 0.000                   | -   | 0.000                    | 0.000          | 0.000          | 0.000   | 0.000                  | 0.000                       | 24.000            |
| <b>Remarks</b>   |                |                |                         |   |                          |                |                |   |                        |                             |                   |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Navy   |  | <b>Date:</b> February 2018                    |
| <b>Appropriation/Budget Activity</b><br>1319 / 4   | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U) <i>Gerald R Ford CI Nuc Aircraft Carrier CVN 78-80</i> | <b>Project (Number/Name)</b><br>2208 / CVN 21 |
| <p><b><u>D. Acquisition Strategy</u></b></p> <p>The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, EMALS, advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.</p> <p><b><u>E. Performance Metrics</u></b></p> <p>Successfully complete development of TEMP 1610, Rev C and route for signature. Successfully complete all PEO C4I Test Integration Facility (TIF) testing. Successfully execute Sortie Generation Rate Assessment (SGRA) 12 and SGRA 13. Successfully conduct and support feasibility and tradeoff studies and data packages on new and modified shipboard systems, technologies and proposed modification. Data packages shall include information to support program decisions to integrate these efforts into the whole ship design efforts. Successfully conduct IDC shock testing and reporting in order to finalize IDC R&amp;D efforts. Successfully complete Advanced Weapons Elevator Shock and Electromagnetic Interference (EMI) Test qualifications. Successfully complete Plasma Arc Waste Destruction System (PAWDS) Land-Based Test. Successfully create and deliver 21 Decision Memorandums (DM) for Bents/Bays 1-21 on the 03 Level (Gallery Deck) with Layer 31 information. Successfully develop the baseline Technical Data Packages for 39 systems and mature packages in preparation for final GFI arrival. Successfully complete component shock testing.</p> |  |   |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy |                        |                                |             |         |            |  |            |                 |            |  |            | Date: February 2018 |                  |            |                          |
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| Appropriation/Budget Activity<br>1319 / 4              |                        |                                |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604112N I (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |            |                 |            | Project (Number/Name)<br>2208 I CVN 21 |            |                     |                  |            |                          |
| Product Development (\$ in Millions)                   |                        |                                |             | FY 2017 |            | FY 2018  |            | FY 2019<br>Base |            | FY 2019<br>OCO                         |            | FY 2019<br>Total    |                  |            |                          |
| Cost Category Item                                     | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost   | Award Date | Cost            | Award Date | Cost                                   | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| Advanced Design & Development                          | C/CPAF                 | HII : VA                       | 2.786       | 1.821   | Nov 2016   | 2.825  | Nov 2017   | 0.000           |            | -                                      |            | 0.000               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | WR                     | NSWC CARDEROCK : MD            | 2.883       | 1.109   | Oct 2016   | 0.000  |            | 0.500           | Oct 2018   | -                                      |            | 0.500               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | WR                     | NAWC PATUXENT RIVER : MD       | 3.893       | 1.188   | Oct 2016   | 0.000  |            | 0.250           | Oct 2018   | -                                      |            | 0.250               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | WR                     | NSWC DAHLGREN : VA             | 4.252       | 0.515   | Nov 2016   | 0.000  |            | 0.500           | Oct 2018   | -                                      |            | 0.500               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | C/CPAF                 | RAYTHEON : VA                  | 8.053       | 1.188   | Dec 2016   | 10.100   | Nov 2017   | 9.479           | Oct 2018   | -                                      |            | 9.479               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | C/CPFF                 | NAVSEA SEAPORT : DC            | 13.164      | 1.386   | Dec 2016   | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | Various                | MISCELLANEOUS : VARIOUS        | 3.640       | 0.248   | Nov 2016   | 7.538  | Nov 2017   | 0.250           | Nov 2018   | -                                      |            | 0.250               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | WR                     | NSWC PHILADELPHIA : PA         | 9.519       | 0.000   |            | 4.543  | Nov 2017   | 0.618           | Oct 2018   | -                                      |            | 0.618               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | WR                     | SPAWAR : CA                    | 1.178       | 0.000   |            | 6.368  | Nov 2017   | 0.000           |            | -                                      |            | 0.000               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | WR                     | NSWC CORONA : CA               | 1.189       | 0.000   |            | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | Continuing       | Continuing | Continuing               |
| Advanced Design & Development                          | WR                     | NAWC LAKEHURST : NJ            | 5.204       | 0.000   |            | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | 0.000            | 5.204      | -                        |
| Subtotal   |                        |                                | 55.761      | 7.455   |            | 31.374   |            | 11.597          |            | -                                      |            | 11.597              | Continuing       | Continuing | N/A                      |
| Test and Evaluation (\$ in Millions)                   |                        |                                |             | FY 2017 |            | FY 2018  |            | FY 2019<br>Base |            | FY 2019<br>OCO                         |            | FY 2019<br>Total    |                  |            |                          |
| Cost Category Item                                     | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost   | Award Date | Cost            | Award Date | Cost                                   | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| Development Test & Evaluation                          | C/CPAF                 | HII : VA                       | 4.356       | 0.834   | Nov 2016   | 1.338  | Nov 2017   | 0.165           | Nov 2018   | -                                      |            | 0.165               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | WR                     | NAWC PATUXENT RIVER : MD       | 5.242       | 3.878   | Oct 2016   | 1.576  | Nov 2017   | 0.403           | Nov 2018   | -                                      |            | 0.403               | Continuing       | Continuing | Continuing               |



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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy |                        |                                |             |         |            |  |            |                 |            |  |            | Date: February 2018 |                  |            |                          |
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| Appropriation/Budget Activity<br>1319 / 4              |                        |                                |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |            |                 |            | Project (Number/Name)<br>2208 / CVN 21 |            |                     |                  |            |                          |
| Test and Evaluation (\$ in Millions)                   |                        |                                |             | FY 2017 |            | FY 2018  |            | FY 2019<br>Base |            | FY 2019<br>OCO                         |            | FY 2019<br>Total    |                  |            |                          |
| Cost Category Item                                     | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost   | Award Date | Cost            | Award Date | Cost                                   | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| Development Test & Evaluation                          | WR                     | NSWC DAHLGREN : VA             | 5.646       | 3.911   | Oct 2016   | 5.034  | Nov 2017   | 1.648           | Nov 2018   | -                                      |            | 1.648               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | WR                     | NSWC CARDEROCK : MD            | 18.817      | 0.597   | Oct 2016   | 6.048  | Nov 2017   | 0.533           | Nov 2018   | -                                      |            | 0.533               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | WR                     | SPAWAR : CA                    | 4.020       | 0.696   | Nov 2016   | 0.000  |            | 0.040           | Nov 2018   | -                                      |            | 0.040               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | C/CPAF                 | RAYTHEON : VA                  | 6.158       | 1.716   | Dec 2016   | 1.475  | Dec 2017   | 0.000           |            | -                                      |            | 0.000               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | WR                     | SSC ATLANTIC : SC              | 0.025       | 0.832   | Nov 2016   | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | Various                | MISCELLANEOUS : VARIOUS        | 1.315       | 0.346   | Dec 2016   | 4.681  | Dec 2017   | 1.366           | Oct 2018   | -                                      |            | 1.366               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | C/CPFF                 | NAVSEA SEAPORT : DC            | 0.616       | 0.000   |            | 1.100  | Nov 2017   | 1.469           | Nov 2018   | -                                      |            | 1.469               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | C/BA                   | NSWC PORT HUENEME : CA         | 0.182       | 0.590   | Dec 2016   | 0.000  |            | 0.799           | Oct 2018   | -                                      |            | 0.799               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | C/BA                   | NSWC CORONA : CA               | 0.182       | 1.436   | Dec 2016   | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | WR                     | NAWC LAKEHURST : NJ            | 2.821       | 0.000   |            | 1.680  | Nov 2017   | 0.200           | Nov 2018   | -                                      |            | 0.200               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | WR                     | NSWC PHILADELPHIA : PA         | 0.434       | 0.000   |            | 1.200  | Nov 2017   | 3.124           | Nov 2018   | -                                      |            | 3.124               | Continuing       | Continuing | Continuing               |
| Operational Test & Evaluation                          | WR                     | COMOPTEVFOR : VA               | 5.044       | 10.107  | Dec 2016   | 2.440  | Nov 2017   | 2.904           | Nov 2018   | -                                      |            | 2.904               | Continuing       | Continuing | Continuing               |
| Operational Test & Evaluation                          | WR                     | NAWC PATUXENT RIVER : MD       | 0.138       | 0.000   |            | 0.000  |            | 0.150           | Oct 2018   | -                                      |            | 0.150               | Continuing       | Continuing | Continuing               |
| Development Test & Evaluation                          | C/CPFF                 | GRYPHON (SEI&T) : IN           | 0.000       | 0.000   |            | 0.000  |            | 0.631           | Dec 2018   | -                                      |            | 0.631               | 0.000            | 0.631      | -                        |
| Development Test & Evaluation                          | C/CPFF                 | GENERAL ATOMICS : CA           | 10.708      | 0.000   |            | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | 0.000            | 10.708     | -                        |
| Development Test & Evaluation                          | C/CPAF                 | BOEING : VA                    | 0.400       | 0.000   |            | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | 0.000            | 0.400      | -                        |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy  |                        |                                |             |         |            |  |            |                 |            |  |            | Date: February 2018 |                  |            |                          |
| Appropriation/Budget Activity<br>1319 / 4   |                        |                                |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604112N I (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |            |                 |            | Project (Number/Name)<br>2208 I CVN 21 |            |                     |                  |            |                          |
| Test and Evaluation (\$ in Millions)  |                        |                                |             | FY 2017 |            | FY 2018  |            | FY 2019<br>Base |            | FY 2019<br>OCO                         |            | FY 2019<br>Total    |                  |            |                          |
| Cost Category Item  | Contract Method & Type | Performing Activity & Location | Prior Years | Cost    | Award Date | Cost   | Award Date | Cost            | Award Date | Cost                                   | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| Development Test & Evaluation   | C/CPFF                 | BECHTEL : PA                   | 1.600       | 0.000   |            | 0.000  |            | 0.000           |            | -                                      |            | 0.000               | 0.000            | 1.600      | -                        |
| Subtotal  |                        |                                | 67.704      | 24.943  |            | 26.572   |            | 13.432          |            | -                                      |            | 13.432              | Continuing       | Continuing | N/A                      |
| Remarks   |                        |                                |             |         |            |  |            |                 |            |  |            |                     |                  |            |                          |
| All Prior Years figures include the funding amounts from the FY 16 Congressional Add.   |                        |                                |             |         |            |  |            |                 |            |  |            |                     |                  |            |                          |
| NSWC Philadelphia Cost Growth - Testing on CVN 78 is projected to increase in FY19 after the ship comes out of Post Shakedown Availability. The ship will be underway for nine (9) Independent Steaming Events and will conduct extensive testing and certification, particularly of Hull, Mechanical & Electrical (HM&E) systems. The additional funding to NSWC PD will fund HM&E Subject Matter Experts to evaluate, summarize and assess these test results against operational testing Measures of Effectiveness and Measures of Suitability. This will allow the program to identify areas of concern and to mitigate risk prior to entering operational testing. |                        |                                |             |         |            |  |            |                 |            |  |            |                     |                  |            |                          |
|   |                        |                                | Prior Years | FY 2017 |            | FY 2018  |            | FY 2019<br>Base |            | FY 2019<br>OCO                         |            | FY 2019<br>Total    | Cost To Complete | Total Cost | Target Value of Contract |
| Project Cost Totals   |                        |                                | 123.465     | 32.398  |            | 57.946   |            | 25.029          |            | -                                      |            | 25.029              | Continuing       | Continuing | N/A                      |
| Remarks   |                        |                                |             |         |            |  |            |                 |            |  |            |                     |                  |            |                          |

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**Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy**

**Date:** February 2018

**Appropriation/Budget Activity**

1319 / 4

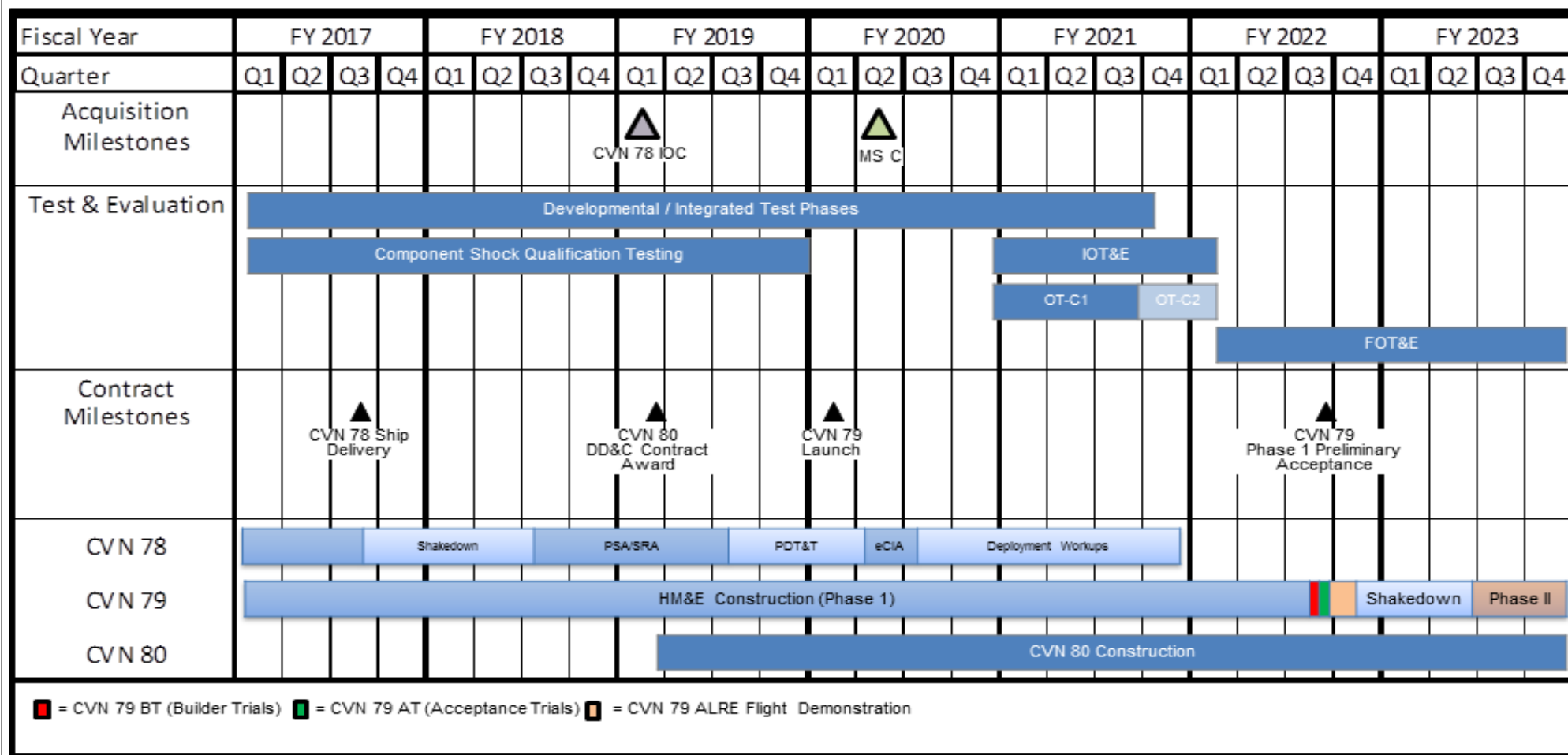
**R-1 Program Element (Number/Name)**

PE 0604112N / (U)Gerald R Ford CI Nuc  
Aircraft Carrier CVN 78-80

**Project (Number/Name)**

2208 / CVN 21

**Gerald R. Ford Class Carriers**



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| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Navy |  |   | <b>Date:</b> February 2018 |
| <b>Appropriation/Budget Activity</b><br>1319 / 4              | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U) <i>Gerald R Ford CI Nuc Aircraft Carrier CVN 78-80</i> | <b>Project (Number/Name)</b><br>2208 / CVN 21 |                            |

Schedule Details

| Events by Sub Project                 | Start   |      | End     |      |
|---------------------------------------|---------|------|---------|------|
|                                       | Quarter | Year | Quarter | Year |
| <b>Proj 2208</b>                      |         |      |         |      |
| Initial Operational Capability        | 1       | 2019 | 1       | 2019 |
| Milestone C                           | 2       | 2020 | 2       | 2020 |
| Component Shock Qualification Testing | 1       | 2017 | 4       | 2019 |
| Initial Operational Test & Evaluation | 4       | 2020 | 1       | 2022 |
| CVN 80 Construction Contract Award    | 1       | 2019 | 1       | 2019 |

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|---|-------------|---------|---------|--------------|--|---------------|---------|---------|---------------------------------------|---------------------|------------------|------------|
| Exhibit R-2A, RDT&E Project Justification: PB 2019 Navy   |             |         |         |              |  |               |         |         |                                       | Date: February 2018 |                  |            |
| Appropriation/Budget Activity<br>1319 / 4   |             |         |         |              | R-1 Program Element (Number/Name)<br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |               |         |         | Project (Number/Name)<br>4004 / EMALS |                     |                  |            |
| 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 |
| 4004: EMALS   | 23.511      | 36.787  | 25.989  | 33.092       | -  | 33.092        | 17.477  | 17.477  | 4.200                                 | 0.000               | 0.000            | 158.533    |
| Quantity of RDT&E Articles  |             | -       | -       | -            | -  | -             | -       | -       | -                                     | -                   |                  |            |
| Project MDAP/MAIS Code: 223   |             |         |         |              |  |               |         |         |                                       |                     |                  |            |
| A. Mission Description and Budget Item Justification  |             |         |         |              |  |               |         |         |                                       |                     |                  |            |
| This project provides for the development of an advanced technology aircraft launch system in support of the CVN 78 design and construction schedule, as well as Engineering and Life Cycle System (E&LCS) design. The Electromagnetic Aircraft Launch System (EMALS) will be the aircraft catapult for CVN 78 Class ships. EMALS provides better control of applied forces, both peak and transient dynamic, improved reliability and maintainability, increased operational availability, and reduced operator and maintainer workload.   |             |         |         |              |  |               |         |         |                                       |                     |                  |            |
| B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)  |             |         |         |              |  |               |         |         |                                       |                     |                  |            |
| Title: EMALS<br><br>Articles:<br><br>Description: EMALS<br><br>FY 2018 Plans:<br>Continue EMALS Integrated Test & Evaluation (IT&E) land-based testing using deadloads and aircraft for the correction of deficiencies, critical reliability growth to achieve fleet operational requirements and to maintain test unit cycles above shipboard cycles. Conduct Environmental Qualification Testing (EQT) for Launch Control Subsystem (LCS) components deferred from System Development & Demonstration (SDD) and conduct EMALS component shock testing. Maintain EMALS shore-based test site to support: engineering investigations, software integration, deficiency resolution, component obsolescence regression test, and cyber security assessment/mitigation. Complete development of formal curriculum fleet operations and maintenance training. Continue the development of schoolhouse training systems for future Ford Class Aircraft Carrier personnel. Provide interim training for crews until formal schoolhouse training is established.<br><br>FY 2019 Base Plans:<br>Continue EMALS Integrated Test & Evaluation (IT&E) land-based testing using deadloads for the correction of deficiencies. Complete Environmental Qualification Testing (EQT) for Launch Control Subsystem (LCS) components deferred from System Development & Demonstration (SDD) and EMALS component shock testing. Maintain EMALS shore-based test site to support: engineering investigations, software integration, deficiency resolution, component obsolescence regression test, and cyber security assessment/mitigation. Complete the |             |         |         |              |  |               | FY 2017 | FY 2018 | FY 2019 Base                          | FY 2019 OCO         | FY 2019 Total    |            |
|   |             |         |         |              |  |               | 36.787  | 25.989  | 33.092                                | 0.000               | 33.092           |            |
|   |             |         |         |              |  |               | -       | -       | -                                     | -                   | -                |            |
|   |             |         |         |              |  |               |         |         |                                       |                     |                  |            |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Navy  |                |                |                         |   |                          |                |                | <b>Date:</b> February 2018                   |                |                             |                        |                          |
| <b>Appropriation/Budget Activity</b><br>1319 / 4  |                |                |                         | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |                          |                |                | <b>Project (Number/Name)</b><br>4004 / EMALS |                |                             |                        |                          |
| <b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b><br><br>development of schoolhouse training systems for Ford Class Aircraft Carrier personnel. Provide interim training for crews until formal schoolhouse training is established. Begin the development of the required processes and procedures to plan for Depot Level activities. Initiate the planning and analysis necessary to standup EMALS Depot Level maintenance, overhaul and repair facility/facilities for EMALS components.<br><br><b>FY 2019 OCO Plans:</b><br>N/A<br><br><b>FY 2018 to FY 2019 Increase/Decrease Statement:</b><br>The increase from FY 2018 to FY 2019 supports the development of EMALS depot level maintenance. |                |                |                         |   |                          |                |                | <b>FY 2017</b>                               | <b>FY 2018</b> | <b>FY 2019<br/>Base</b>     | <b>FY 2019<br/>OCO</b> | <b>FY 2019<br/>Total</b> |
| <b>Accomplishments/Planned Programs Subtotals</b>   |                |                |                         |   |                          |                |                | 36.787                                       | 25.989         | 33.092                      | 0.000                  | 33.092                   |
| <b>C. Other Program Funding Summary (\$ in Millions)</b>  |                |                |                         |   |                          |                |                |  |                |                             |                        |                          |
| <u>Line Item</u>  | <u>FY 2017</u> | <u>FY 2018</u> | <u>FY 2019<br/>Base</u> | <u>FY 2019<br/>OCO</u>  | <u>FY 2019<br/>Total</u> | <u>FY 2020</u> | <u>FY 2021</u> | <u>FY 2022</u>                               | <u>FY 2023</u> | <u>Cost To<br/>Complete</u> | <u>Total Cost</u>      |                          |
| • RDTEN / 0604567N: Project Units 3108, 3179, 4007  | 68.892         | 54.131         | 50.110                  | -   | 50.110                   | 46.566         | 45.327         | 46.226                                       | 47.200         | Continuing                  | Continuing             |                          |
| • SCN / 2001: Carrier Replacement Program   | 2,626.567      | 4,441.772      | 1,598.181               | -   | 1,598.181                | 2,146.535      | 3,239.606      | 2,910.491                                    | 3,378.355      | 10,602.689                  | 50,900.224             |                          |
| • SCN / 5300: Completion of Prior Year Shipbuilding Programs  | 0.000          | 20.000         | 0.000                   | -   | 0.000                    | 0.000          | 0.000          | 0.000  | 0.000          | 0.000                       | 1,394.860              |                          |
| • OMN / 1B2B: CVN 78 Ford Class Training and Sustainment (12BJ0)  | 17.536         | 14.008         | 9.043                   | -   | 9.043                    | 8.150          | 6.346          | 6.907  | 7.054          | Continuing                  | Continuing             |                          |
| • OPN / 5664: Surface Training Equipment  | 4.490          | 12.010         | 7.942                   | -   | 7.942                    | 0.994          | 4.965          | 2.964  | 3.023          | Continuing                  | Continuing             |                          |
| • OPN / 4213: Aircraft Support Equipment  | 81.428         | 63.695         | 65.459                  | -   | 65.459                   | 95.441         | 72.816         | 73.371                                       | 83.861         | Continuing                  | Continuing             |                          |
| • OMN / 1B1B: Mission and Other Ship Operations (11B30)   | 21.000         | 0.000          | 0.000                   | -   | 0.000                    | 0.000          | 0.000          | 0.000  | 0.000          | 0.000                       | 21.000                 |                          |
| <b>Remarks</b><br>OPN 4213 includes a portion of line item funding for Electro Magnetic Aircraft Launch System (EMALS).   |                |                |                         |   |                          |                |                |  |                |                             |                        |                          |

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| <b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Navy  |  | <b>Date:</b> February 2018                   |
| <b>Appropriation/Budget Activity</b><br>1319 / 4  | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U) <i>Gerald R Ford Cl Nuc Aircraft Carrier CVN 78-80</i> | <b>Project (Number/Name)</b><br>4004 / EMALS |
| <p><b><u>D. Acquisition Strategy</u></b></p> <p>The CVN 78 is the first ship of the CVN 78 Class of aircraft carriers designed to replace USS ENTERPRISE and the ships of the NIMITZ Class. The CVN 78 will feature a new nuclear propulsion and electrical generation/distribution system, new electromagnetic aircraft launching system (EMALS), advanced arresting gear (AAG) system, all electric auxiliaries, warfare system improvements, survivability enhancements, improved weapons handling, and improved aircraft servicing. These design features will result in lower manpower and total ownership costs as compared to the NIMITZ Class. Additionally, the following war fighting benefits will be realized: increased sortie generation rate, improved ship self-defense capability, increased launch and recovery capability/flexibility, increased operational availability, and increased flexibility to support future upgrades.</p> <p><b><u>E. Performance Metrics</u></b></p> <p>Successfully complete System Functional Demonstration (SFD) testing. Successfully complete Environmental Qualification Testing (EQT). Successfully complete Shipset Controls Lab testing. Successfully complete Integrated Test and Evaluation (IT&amp;E) including Environmental Qualification Testing (EQT), correction of deficiencies, reliability growth and shock testing.</p> |  |  |

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| Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Navy   |                        |   |             |         |            |  |            |                 |            |                                       |            | Date: February 2018 |                  |            |                          |
| Appropriation/Budget Activity<br>1319 / 4  |                        |   |             |         |            | R-1 Program Element (Number/Name)<br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |            |                 |            | Project (Number/Name)<br>4004 / EMALS |            |                     |                  |            |                          |
| Product Development (\$ in Millions)   |                        |   |             | FY 2017 |            | FY 2018  |            | FY 2019<br>Base |            | FY 2019<br>OCO                        |            | FY 2019<br>Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location            | Prior Years | Cost    | Award Date | Cost   | Award Date | Cost            | Award Date | Cost                                  | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| Primary HW Development - SDD   | C/CPFF                 | General Atomics : San Diego, CA           | 0.000       | 22.746  | Nov 2016   | 9.200  | Nov 2017   | 0.000           |            | -                                     |            | 0.000               | 0.000            | 31.946     | 31.945                   |
| Training Development   | C/FFP                  | Pro-Active Technologies, Inc : Oviedo, FL | 0.000       | 5.200   | Aug 2017   | 1.865  | Jul 2018   | 0.000           |            | -                                     |            | 0.000               | 0.000            | 7.065      | 7.065                    |
| Primary HW Development   | WR                     | NAWCAD Lakehurst : Lakehurst, NJ          | 0.000       | 3.220   | Nov 2016   | 2.852  | Nov 2017   | 1.264           | Nov 2018   | -                                     |            | 1.264               | 0.000            | 7.336      | -                        |
| Prior Year Cost No Longer Funded in FYDP   | Various                | Various : Various                         | 19.020      | 0.000   |            | 0.000  |            | 0.000           |            | -                                     |            | 0.000               | 0.000            | 19.020     | -                        |
| Subtotal   |                        |   | 19.020      | 31.166  |            | 13.917   |            | 1.264           |            | -                                     |            | 1.264               | 0.000            | 65.367     | N/A                      |
| Remarks  |                        |   |             |         |            |  |            |                 |            |                                       |            |                     |                  |            |                          |
| FY17 Cost Categories updated to reflect actuals, current estimates and execution plans. FY18 and FY19 Cost Categories added to provide updated plans for Training Systems estimates. |                        |   |             |         |            |  |            |                 |            |                                       |            |                     |                  |            |                          |
| Support (\$ in Millions)   |                        |   |             | FY 2017 |            | FY 2018  |            | FY 2019<br>Base |            | FY 2019<br>OCO                        |            | FY 2019<br>Total    |                  |            |                          |
| Cost Category Item   | Contract Method & Type | Performing Activity & Location            | Prior Years | Cost    | Award Date | Cost   | Award Date | Cost            | Award Date | Cost                                  | Award Date | Cost                | Cost To Complete | Total Cost | Target Value of Contract |
| Government Engineering Support   | WR                     | Various : Various                         | 0.000       | 0.144   | Feb 2017   | 0.115  | Nov 2017   | 0.000           |            | -                                     |            | 0.000               | 0.000            | 0.259      | -                        |
| Training Support   | WR                     | NAWCAD TSD : Orlando, FL                  | 0.000       | 0.296   | Feb 2017   | 0.355  | Nov 2017   | 0.295           | Nov 2018   | -                                     |            | 0.295               | 0.000            | 0.946      | -                        |
| Training Support   | WR                     | NAWCAD Lakehurst : Lakehurst, NJ          | 0.000       | 0.000   |            | 1.749  | Nov 2017   | 0.695           | Nov 2018   | -                                     |            | 0.695               | 0.000            | 2.444      | -                        |
| Depot Logistics Development  | TBD                    | General Atomics : San Diego, CA           | 0.000       | 0.000   |            | 0.000  |            | 15.936          | Jan 2019   | -                                     |            | 15.936              | 36.100           | 52.036     | 52.036                   |
| Government Eng Support   | WR                     | NAWCAD Lakehurst : Lakehurst, NJ          | 0.000       | 0.000   |            | 0.000  |            | 1.116           | Nov 2018   | -                                     |            | 1.116               | 3.054            | 4.170      | -                        |
| Subtotal   |                        |   | 0.000       | 0.440   |            | 2.219  |            | 18.042          |            | -                                     |            | 18.042              | 39.154           | 59.855     | N/A                      |



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| <b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2019 Navy</b>  |                                   |   |                    |   |                   |                |                   |                     |                   |  |                   |                      | <b>Date:</b> February 2018 |                   |                                 |
| <b>Appropriation/Budget Activity</b><br>1319 / 4   |                                   |   |                    | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U)Gerald R Ford CI Nuc<br>Aircraft Carrier CVN 78-80 |                   |                |                   |                     |                   | <b>Project (Number/Name)</b><br>4004 / EMALS |                   |                      |                            |                   |                                 |
| <b>Support (\$ in Millions)</b>  |                                   |   |                    | <b>FY 2017</b>  |                   | <b>FY 2018</b> |                   | <b>FY 2019 Base</b> |                   | <b>FY 2019 OCO</b>                           |                   | <b>FY 2019 Total</b> |                            |                   |                                 |
| <b>Cost Category Item</b>  | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>   | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>                                  | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b>    | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| <b>Remarks</b><br>Support cost elements added to reflect actuals for FY17 and to provide a more detailed breakout of FY18 and FY19 plans for government engineering and Training Support related to IT&E and Training Systems Development. FY19 plans added to support Depot Planning efforts.   |                                   |   |                    |   |                   |                |                   |                     |                   |  |                   |                      |                            |                   |                                 |
| <b>Test and Evaluation (\$ in Millions)</b>  |                                   |   |                    | <b>FY 2017</b>  |                   | <b>FY 2018</b> |                   | <b>FY 2019 Base</b> |                   | <b>FY 2019 OCO</b>                           |                   | <b>FY 2019 Total</b> |                            |                   |                                 |
| <b>Cost Category Item</b>  | <b>Contract Method &amp; Type</b> | <b>Performing Activity &amp; Location</b> | <b>Prior Years</b> | <b>Cost</b>   | <b>Award Date</b> | <b>Cost</b>    | <b>Award Date</b> | <b>Cost</b>         | <b>Award Date</b> | <b>Cost</b>                                  | <b>Award Date</b> | <b>Cost</b>          | <b>Cost To Complete</b>    | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| Integrated Test & Evaluation   | WR                                | NAWC Lakehurst : Lakehurst, NJ            | 0.000              | 3.232   | Nov 2016          | 3.474          | Nov 2017          | 1.699               | Nov 2018          | -  |                   | 1.699                | 0.000                      | 8.405             | -                               |
| Integrated Test & Evaluation   | C/CPFF                            | General Atomics : San Diego, CA           | 0.000              | 0.000   |                   | 3.934          | Dec 2017          | 12.087              | Nov 2018          | -  |                   | 12.087               | 0.000                      | 16.021            | 16.021                          |
| Developmental T&E  | SS/CPFF                           | The Boeing Company : St. Louis, MO        | 0.000              | 1.949   | Mar 2017          | 2.445          | Jun 2018          | 0.000               |                   | -  |                   | 0.000                | 0.000                      | 4.394             | 4.394                           |
| Prior Year Cost No Longer Funded in FYDP   | Various                           | Various : Various                         | 4.491              | 0.000   |                   | 0.000          |                   | 0.000               |                   | -  |                   | 0.000                | 0.000                      | 4.491             | -                               |
| <b>Subtotal</b>  |                                   |   | 4.491              | 5.181   |                   | 9.853          |                   | 13.786              |                   | -  |                   | 13.786               | 0.000                      | 33.311            | N/A                             |
| <b>Remarks</b><br>FY17 updated for actuals. FY18 was updated to reflect current estimates and new cost category to support deadload and aircraft testing for the correction of deficiencies Integrated Test & Evaluation (IT&E). The increase from FY18 to FY19 supports Integrated Test & Evaluation deadload testing for correction of deficiencies, Environmental Qualification Testing (EQT) for Launch Control Subsystem (LCS) components, EMALS component shock testing and the transition out of SDD to IT&E. |                                   |   |                    |   |                   |                |                   |                     |                   |  |                   |                      |                            |                   |                                 |
|  |                                   |   | <b>Prior Years</b> | <b>FY 2017</b>  |                   | <b>FY 2018</b> |                   | <b>FY 2019 Base</b> |                   | <b>FY 2019 OCO</b>                           |                   | <b>FY 2019 Total</b> | <b>Cost To Complete</b>    | <b>Total Cost</b> | <b>Target Value of Contract</b> |
| <b>Project Cost Totals</b>   |                                   |   | 23.511             | 36.787  |                   | 25.989         |                   | 33.092              |                   | -  |                   | 33.092               | 39.154                     | 158.533           | N/A                             |
| <b>Remarks</b>   |                                   |   |                    |   |                   |                |                   |                     |                   |  |                   |                      |                            |                   |                                 |

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Navy

Date: February 2018

Appropriation/Budget Activity

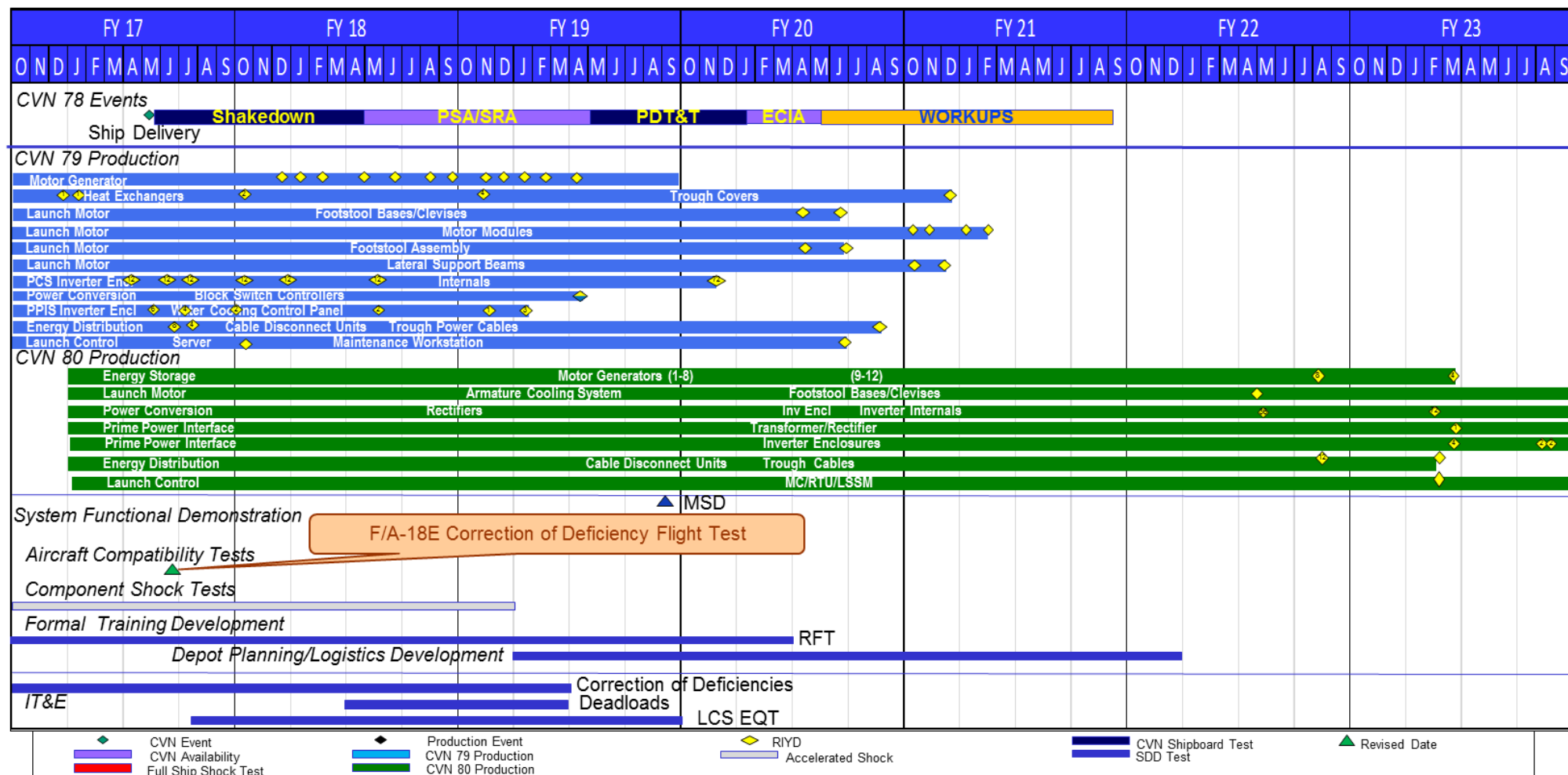
1319 / 4

R-1 Program Element (Number/Name)

PE 0604112N / (U)Gerald R Ford CI Nuc  
Aircraft Carrier CVN 78-80

Project (Number/Name)

4004 / EMALS



**UNCLASSIFIED**

|   |  |  |                            |
|---|--|--|----------------------------|
| <b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Navy |  |  | <b>Date:</b> February 2018 |
| <b>Appropriation/Budget Activity</b><br>1319 / 4              | <b>R-1 Program Element (Number/Name)</b><br>PE 0604112N / (U) <i>Gerald R Ford CI Nuc Aircraft Carrier CVN 78-80</i> | <b>Project (Number/Name)</b><br>4004 / EMALS |                            |

Schedule Details

| Events by Sub Project  | Start   |      | End     |      |
|--|---------|------|---------|------|
|  | Quarter | Year | Quarter | Year |
| <b><i>Proj 4004</i></b>  |         |      |         |      |
| EMALS SDD Complete   | 4       | 2018 | 4       | 2018 |
| EMALS Integrated Test & Evaluation (IT&E)                                      | 1       | 2017 | 1       | 2020 |
| EMALS Component Shock Test   | 1       | 2017 | 1       | 2019 |
| EMALS Launch Control Subsystem (LCS) Environmental Qualification Testing (EQT) | 4       | 2017 | 4       | 2019 |
| EMALS Depot Level Planning   | 2       | 2019 | 1       | 2022 |