NAVSEA
STANDARD ITEM

FY-20

ITEM NO: 009-60
DATE: ***01 OCT 2018***
CATEGORY: I

1. SCOPE:

1.1 Title: Schedule and Associated Reports for Availabilities Over 9 Weeks in Duration; provide and manage

2. REFERENCES:

2.1 Standard Items

2.2 S9AA***0***-AB-GOS-010, General Specifications for Overhaul of Surface Ships

3. REQUIREMENTS:

3.1 Develop one legible copy in Gantt Chart format of an Integrated Production Schedule (IPS) ***using Critical Path Method (CPM) Network Analysis principles, tools, and practices*** that reflects ***accurate scheduling data for each key event and milestone using automated Network Analysis tools*** in accordance with the following requirements:

3.1.1 Include Key Events, Milestones, tests, and work being accomplished by Alteration Installation Teams (AITs), Government-Contracted Third Party Maintenance Providers, Ship's Force (S/F), Commercial Industrial Services (CISs), and Fleet Maintenance Activities (FMAs).

3.1.1.1 Alteration (ALT) numbers, Job Sequence Numbers (JSNs), and Task Order numbers (TOs) are considered equivalent to the contractor’s Work Specification Work Items for the purposes of scheduling the work of these third-party organizations in accordance with this Standard Item.

3.1.1.2 The term Work Item is inclusive of these additional methods of identifying a body of work.

3.1.2 Schedule each Work Item to the Work Activity level, listing the planned start and planned completion dates, and durations for each Work Activity.

3.1.2.1 Assign each Work Activity with the appropriate predecessor and successor relationships within the contractor’s scheduling software that establish the logic relationship between schedule Work Activities. ***Each activity must have at least one predecessor and one***

successor (no isolated or dangling Events or Activities), with the exception of the Key Event Start Availability (which may have no predecessors) and the Key Event Complete Availability (which may have no successors). Each Event and Activity may have more than one predecessor and more than one successor.

3.1.2.2 Assign appropriate predecessor relationships to each Key Event and Milestone(s) to ensure there is an accurate logical progression through all work activities leading to their assigned Key Event and Milestone(s), and ensure the IPS supports accurate prediction of Key Event and Milestone(s) attainment.

3.1.2.3 Schedule Stage 2 Weight Tests and Hydrostatic Tests, and all Stage 3 through Stage 6 required tests as Work Activities by Work Item. Include the predecessor/successor relationships between tests, the production work, and system restoration required to manage work-to-test progression. Test Stages are defined in Section 092 of 2.2.

3.1.3 Schedule production work final inspections and testing for work that has to be completed prior to pre-flood/undocking and which generates technical data requiring Government review to complete no later than four days prior to the scheduled undocking (when applicable) or provide a technical justification for not meeting this requirement.

3.1.4 Develop the Schedule of Record (SOR), a revised IPS at the start of the availability (A-0 day) that includes refined sequencing and completeness as a result of completed subcontracting actions, incorporation of additional Government Furnished Information (GFI), or any contract modifications increasing the scope of work between contract/delivery Order award and availability start. Work activities should be scheduled such that no portion of a Work Activity's effort exceeds the dates of its assigned Key Event or Milestone(s).

3.1.5 Identify the amount of total float available on each Work Item Work Activity. Activity schedules should be based on a 5-day workweek unless otherwise specified. Manpower resource allocations ***must*** support accomplishment of the availability on a 5-day workweek basis.

3.1.6 Revise Weekly IPS at the Work Activity level to include additions, deletions, modifications, actual start and finish dates, progress, and completions. Progress ***must*** be based on degree of completion of physical work or accomplishment of the Work Activity.

3.1.6.1 Reassign Milestone and Key Event relationships for incomplete Work Activities when the associated Milestone or Key Event has passed and the Work Activity was authorized as an exception.

3.1.6.2 Activities that fall outside their assigned Key Event or Milestone ***must*** be identified and a mitigation plan ***must*** be developed.

3.1.7 Include the following minimum data elements for each Work Activity in the schedule, as appropriate. Elements listed in Table 1 are not

required to be displayed in ADOBE PDF views of submitted IPS unless otherwise directed in this Standard Item.

Table 1
Activity Data Elements and Descriptions

Data Element	Description
Work Item Number (as appropriate)	4-E specification Work Item number
Work Activity Identifier	Numerical designator identifying the Work Activity within the Work Breakdown Structure ***(WBS)***
Title	Descriptive title of Work Item and Work Activity
ICN (as appropriate)	Industrial Control Number (ICN): AIM/PSS system identifier for naval shipyard and FMA work
Key Event	Key Event applicable to the Work Activity (See 4.5)
Milestone (as appropriate)	Milestone applicable to the Work Activity
System	System(s) affected (See 4.6)
Component (as appropriate)	Component Unit (For example: tank, valve, motor, pump)
Location	Work location/compartment number (See 4.7)
Executing Activity	ID specific organization: Prime KTR, Sub-KTR, FMA, SMMO, AIT, or OSIC
Superintendent or Zone Manager	Responsible Contractor Superintendent or Zone Manager
Baseline Start	The start date identified on the current baseline IPS
Baseline Finish	The finish date identified on the current baseline IPS
Early Start	Software determined date (See 4.1.13)
Early Finish	Software determined date (See 4.1.14)
Late Start	Software determined date (See 4.1.15)
Late Finish	Software determined date (See 4.1.16)
Actual Start	Actual date for the Work Activity's start
Actual Finish	Actual date for the Work Activity's finish
Percent Complete	Degree of completion based on the Work Activity's work scope and degree of accomplishment
Duration	The total number of work periods required to complete a Work Activity.
Calendar Identification	Number of scheduled workdays per week
Total Float	The amount of time a Work Activity can be delayed without affecting the project finish date
Predecessor	***An Activity or Event that immediately precedes one or more Activities or Events with a direct tie in the Total Project Network. Every Activity and Event in the Total Project Network must have at least one Predecessor (except Start Availability).***

Successor	***An Activity or Event that immediately follows one or more Activities or Events with a direct tie in the Total Project Network. Every Activity and Event in the Total Project Network must have at least one Successor (except Complete Availability).***

3.1.8 Develop an export of the IPS data elements in a sortable/filterable spreadsheet format compatible with Microsoft Excel.

3.2 Display the IPS in a time-oriented Gantt chart format that shows Critical Path and Controlling Work Items at the Work Activity level and assigned Key Events and/or Milestones.

3.2.1 Revise the Gantt Chart weekly in conjunction with the weekly IPS revisions of 3.1.6.

3.3 Develop a Critical Path Network in Precedence Diagram Method (PDM) format that displays the Critical Path of the availability and the Controlling Work Items with associated Key Events and Milestones. Display Critical Path and Controlling Work Items at the Work Activity level to provide visual representation of the logic relationships between displayed Work Activities.

3.3.1 The network or any sub-network thereof may be continued on additional pages.

3.3.2 Label each Work Item, Work Activity, Milestone, and Key Event of the network with ***each Activity box on every Precedence Diagram must contain the following data elements of 3.1.8: Activity Identifier, Activity Title, Early Start Date or Actual Start Date, if Started, Early Finish Dates or Actual Finish Date, if finished, Original Duration, Percent Complete, Calendar Identification, and Total Float***.

3.3.3 Revise the network weekly in conjunction with the weekly IPS revisions of 3.1.6.

3.4 Provide Key Event and Milestone ***Analysis Report***.

3.4.1 ***Generate a Key Event and Milestone Analysis Report that includes the following information for each Key Event and Milestone: Event Type, Event Title, Event Designator, Original Schedule Date, Revised Schedule Date, Actual Completion Date, Total Float (not including un-exercised Level of Effort (LOE)), and Comments.***

3.4.1.1 The revised schedule date and actual date of accomplishment ***must*** be left blank on the initial submission and filled in to reflect actual conditions on subsequent submission of the ***report***.

3.4.1.2 Revise the Key Event and Milestone ***Analysis Report*** weekly to reflect up-to-date contract performance.

3.5 Provide manpower management information.

3.5.1 Develop a total manpower-loading curve showing proposed manning throughout the contract period calculated in average men-per-day. The curve ***must*** indicate that portion of the total that is subcontractor provided.

3.5.2 Develop manpower curves showing proposed manning by trade throughout the contract period calculated in average men-per-day. The curves ***must*** indicate that portion of the total that is subcontractor provided. The curve ***must*** be incremented on a weekly progression.

3.5.3 Update the manpower curves of 3.5.1 and 3.5.2 weekly.

3.5.4 Develop a weekly manpower utilization report showing total mandays expended during the previous week, indicating that portion of the total that is subcontractor provided.

3.6 Provide a representative whose function is to coordinate and schedule AIT, Government-Contracted Third Party Maintenance Providers, S/F, CIS, and FMA work with contractor work into the IPS.

3.6.1 The representative ***must*** meet with the AIT, Government-Contracted Third Party Maintenance Providers, S/F, CIS, and FMA between A-90 ***and*** no later than A-5 and then daily thereafter commencing on A-0 to compare and coordinate programmed AIT, Government-Contracted Third Party Maintenance Provider, S/F, CIS, and FMA work with the IPS.

3.6.2 Coordinate AIT, Government-Contracted Third Party Maintenance Provider, S/F, CIS, and FMA work integration into the IPS prior to setting the Schedule of Record (SOR). (See 4.1.21)

3.6.2.1 The representative ***must*** develop a report identifying missing or incomplete schedule integration data for known participants in the availability when the SOR is submitted. Identification of missing or incomplete schedule integration data is required to highlight areas of elevated IPS uncertainty, but ***must*** not be cause for delay in establishing the SoR nor the delivery of reports required under this Standard Item.

3.6.3 Incorporate updated progress from AIT, Government-Contracted Third Party Maintenance Providers, S/F, CIS, FMA, and other maintenance providers into the IPS.

3.6.3.1 Provide a common template in Microsoft Excel compatible format to facilitate submission of progress updates of 3.6.3.

3.6.4 Identify, at the weekly progress meeting, schedule conflicts where programmed AIT, Government-Contracted Third Party Maintenance Provider, S/F, CIS, and FMA work interferes with previously scheduled contractor work.

3.6.5 Identify, at the weekly progress meeting, required AIT, Government-Contracted Third Party Maintenance Provider, S/F, CIS, and FMA

prerequisite actions necessary to support contractor testing and equipment operation schedule.

3.7 Provide cognizant shipyard management representation to participate in the weekly progress meeting at the time and location agreed to by the SUPERVISOR. The representative(s) must be authorized to make management decisions relative to the routine requirements, ***implementation of corrective actions for each schedule shortfall*** that, in good faith, commit the contractor. ***Discussion will include the Key Event and Milestone Analysis of 3.4 and each work item of concern.***

3.8 Participate in review conferences at the 25, 50, and 75 percent points in the availability. Data from the most recent submission in accordance with 3.***9.3*** will be used at the review conferences. Review conferences will be held within two days of the Weekly progress Meeting of 3.7 or, subject to SUPERVISOR approval, may be held simultaneously with the Weekly Progress Meeting. The conferences will be scheduled at a time and place mutually agreeable to all parties. The contractor ***must***:

3.8.1 Be prepared to discuss planned production manning versus actual production manning by total, trades, and subcontractors.

3.8.2 Identify known factors that may affect Key Events, Milestones and the contract completion. Provide recommended courses of action to resolve problem areas.

3.8.3 Provide the SUPERVISOR with the status of open and inspect reports and be prepared to discuss possible impact of growth work in these items at the 25 percent review conference.

3.8.4 Provide the SUPERVISOR with the following information for the 50 percent review conference:

3.8.4.1 A machinery reinstallation plan showing projected dates for installing the equipment on the foundation, hook-up of the equipment, and operational tests of the equipment.

3.8.4.2 A valve status list showing projected completion and reinstallation dates.

3.8.4.3 A list of items required for the next Key Event and Production Completion Date (PCD) that are not complete. Annotate those items on the list that may be in jeopardy of completing by the next Key Event and PCD.

3.8.5 Provide the SUPERVISOR with one legible copy, in approved transferrable media, of a test schedule for all planned underway equipment and system testing to the SUPERVISOR to support the 75 percent review conference.

3.9 Submit the following reports as listed in Adobe Acrobat (.pdf), Microsoft Excel (.xls), or Microsoft Word (.doc) compatible media as per Table 2 and Table 3:

Table 2
Deliverables.

ID Number	Requirements	Title	Format	Due
3.9.1	3.1 3.1.8 3.2 3.3 3.4	Initial IPS -Gantt chart -Spreadsheet -Critical Path (Gantt) -Critical Path Network (PDM) -Key Events/Milestone ***Analysis***	 *.pdf *.xls *.pdf *.pdf *.doc	Based on contract type as listed in Table 3
3.9.2	3.1.4 3.1.8 3.2 3.3 3.4 3.5.1 3.5.2 3.6.2.1	Schedule of Record -Gantt chart -Spreadsheet -Critical Path (Gantt) -Critical Path Network (PDM) -Key Events/Milestone ***Analysis*** -Manpower Curves (Total) -Manpower Curves (Trades) -Incomplete GFI	 *.pdf *.xls *.pdf *.pdf *.doc *.***xls*** *.***xls*** *.doc	A-0
3.9.3	3.1.8 3.2.1 3.3.3 3.4 3.5.3 3.5.4 3.6.2.1 |	Weekly IPS -Spreadsheet -Critical Path (Gantt) -Critical Path Network (PDM) -Key Events/Milestone ***Analysis*** -Manpower Curves (Total/Trades) -Manpower Utilization Report -Incomplete GFI |	 *.xls *.pdf *.pdf *.doc *.***xls*** *.***xls*** *.doc |	Weekly after A-0, ***24 hrs prior to weekly progress meeting***
3.9.4	3.1.6	25 Percent Conference Support -Gantt Chart (Most recent Revised Weekly IPS)	 *.pdf	3 days prior to meeting
3.9.5	3.1.6 3.8.4.1 3.8.4.2 3.8.4.3 ***3.3***	50 Percent Conference Support -Gantt Chart (Most recent Revised Weekly IPS) -Machinery Reinstallation Plan -Valve Listing -Incomplete PCD Listing -***Critical Path Network (PDM)***	 *.pdf *.xls *.xls *.xls ****.pdf***	3 days prior to meeting
3.9.6	3.1.6	75 Percent Conference Support -Gantt Chart (Most recent Revised Weekly	 *.pdf	3 days prior to meeting

	3.8.5 ***3.3***	IPS) -Underway test schedule ***-Critical Path Network (PDM)***	*.***xls*** ****.pdf***	

Table 3
Initial IPS Schedule Submission Requirements

Firm Fixed Price Type Contract	Cost Plus Type Contract
No Later Than (NLT) 15 days after award (Availabilities 64 - 90 days)	NLT A-30 Days(Surface Ships)
NLT 30 days after award (Availabilities greater than 90 days)	NLT A-60 Days(CVNs and Submarines)

4. NOTES:

4.1 Definitions.

4.1.1 Critical Path Method: A step-by-step network-based method for planning and executing complex, interdependent projects that identifies the Critical Path to each Key Event and Milestone using automated Network Analysis Tools. CPM is an important tool for project management because it identifies critical and non-critical tasks to prevent conflicts and bottlenecks. CPM is applied to the analysis of a project network precedence diagram to produce maximum practical efficiency and a focus on the most critical Work Activities in the project based on Total Float.

4.1.2 Work Breakdown Structure: The WBS reflects how each Work Item is broken down into Work Activities in the IPS, representing a manageable unit of work to be accomplished at a specific period of time in relation to other Work Activities in the IPS to complete the Availability. Typical WBS might break a Work Item down into Work Activities to Remove a component, Repair the component, Reinstall the Component, and Test the Component.

4.1.***3*** Industrial Testing: Conducted by using stages of testing for the progressive validation of the proper installation and performance of equipment and systems. Test Stages are identified in 009-67 of 2.1.

4.1.***4*** Integrated Production Schedule (IPS): A schedule used by the contractor as a means of planning, tracking, coordinating and de-conflicting work during the availability. It incorporates all work planned for accomplishment during the maintenance availability including; Alteration Installation Team (AIT), Government-Contracted Third Party Maintenance Providers, Ship's Force, Commercial Industrial Services (CIS), and Fleet Maintenance Activity (FMA) work.

4.1.***5*** Work Activity: A portion of an individual Work Item, which is a logical subdivision of the Work Item, representing a manageable unit of

work which must be accomplished at a specific period of time in relation to other Activities of the Job Order.

4.1.***6*** Duration: The total number of work periods (not including holidays or other nonworking periods) required to complete a scheduled Work Activity.

4.1.***7*** Key Event: An event that, if slippage occurs, could impact or delay the overall schedule, or prevent timely delivery of the vessel. Key Events are identified by the contract, the SUPERVISOR, or the contractor.

4.1.***8*** Milestone: A significant event identified by the Maintenance Team. Milestones are used as a scheduling aid and establish significant points where progress must be evaluated and confirmed. Accumulated failure to achieve Milestones on schedule may result in missed Key Events. Milestones may be identified by either the contractor or the SUPERVISOR.

4.1.***9*** Critical Path: That sequence of Work Activities which forms the work and test chain of the longest duration, and directly affects the completion of the availability. Factors that influence when a Work Activity is on the Critical Path include: time duration required for the Work Activity, space limitations, manpower available, and the predecessor/successor relationships between Work Activities. ***T***he Critical Path is determined by automated schedule analysis and will include any sequential set of Work Activities forming the longest chain of events extending throughout the schedule and which has the least Total Float. |

4.1.***10*** Controlling Work Items: Those Work Items which include activities that are on the critical path of the IPS, which, by virtue of scope, material requirements, complexity, or other considerations, have the significant potential for impact on the scheduled project Key Events or completion of the availability.

4.1.***11*** Total Float: The total number of days that a path of Work Activities can be delayed without affecting the project finish date. A path of Work Activities is established by predecessor and successor relationships.

4.1.***12*** Logic Relationship: Defines an interdependence between Work Activities. It is established by assigning predecessor and successor relationships to Work Activities using the functionality provided by project scheduling software. An individual Work Activity will frequently have more than one predecessor or more than one successor.

4.1.***13*** Network: A graphic display showing the planned sequence and interdependent relationship of Work Activities, Milestones, or Key Events within the Job Order.

4.1.***14*** Resource: Labor and non-labor demands required to complete a Work Activity. These may include personnel (trade skills), material, special tools, facilities, space, and equipment.

4.1.***15*** Early Start: The earliest point in time that a Work Activity may start based on the IPS network logic and any other schedule constraints. Early start dates may change as the availability progresses.

4.1.***16*** Early Finish: The earliest point in time that a Work Activity may be completed based on the IPS network logic and any schedule constraints. Early finish dates may change as the availability progresses.

4.1.***17*** Late Start: The latest point in time that a Work Activity may begin without delaying the applicable Milestone or Key Event based on the IPS network logic.

4.1.***18*** Late Finish: The latest point in time that a Work Activity may be completed without delaying the applicable Milestone or Key Event based on the IPS network logic.

4.1.***19*** Integration: The incorporation of all work (including testing and availability work certification) for all organizations involved in an availability.

4.1.***20*** Precedence Diagram Method (PDM): Used in Critical Path Method Project Management for building a project schedule network diagram using lines and nodes to show the logical relationship between schedule activities.

4.1.***21*** Gantt Chart: A graphic display of schedule-related information. Typically, schedule Work Activities or work breakdown structure components are listed down the left side of the chart, dates are shown across the top, and Work Activity durations are shown as date-placed horizontal bars.

4.1.***22*** Negative Float: The amount of time by which the early start or finish dates of a Work Activity exceeds its late start or ending dates. The quantity of float then indicates the amount of time that must be recovered in order to achieve an imposed date.

4.1.***23*** Schedule of Record: The official IPS at the start of the availability (A-0 day) that includes refined sequencing and completeness as a result of completed subcontracting actions, incorporation of additional Government Furnished Information (GFI), or any contract modifications increasing the scope of work between contract/delivery Order award and availability start.

4.1.24 Un-Exercised Level of Effort: LOE which has not been settled and placed on contract.

4.2 The SUPERVISOR will provide, or direct provision, of the AIT, Government-Contracted Third Party Maintenance Providers, S/F, CIS, and FMA availability data required for schedule integration in 3.1.1, 3.1.2.3, and progress/de-confliction in 3.6.

4.3 The IPS data element export required by 3.1.8 may be used to support the development of the Master Requirements List (MRL) and Event Readiness

List (ERL) of 009-04 of 2.1 and/or locally invoked certification requirements.

4.4 When invoked, the following Standard Items interface with this Standard Item: 009-67, and 009-81.

4.5 The following codes are provided as designators for Key Events within the IPS as directed in 3.1.7.

Code	Description / Meaning
AC	Availability Complete
C5ILO	Command, Control, Communications, Computer, Combat Systems and Intelligence (C5I) Light-Off
DT	Dock Trials
FC	Fast Cruise
UD	Undock/Flood Dock
PCD	Engineering Plant Production Completion Date (Propulsion/Aux)
WC	***Work Complete***
ST	Sea Trials

4.6 The following codes are provided as designators for specific ship systems when applied to Work Activities in the IPS as directed in 3.1.7. More than one designator may be used for a Work Activity. This list is not all-inclusive.

Code	System
ACE	Aircraft Elevator
ACP	Air Conditioning Plant
AG	Arresting Gear
ANT	Antenna
AUX	Auxiliary Steam
BIL	Bilges
CAT	Catapults
CHT	Collecting, Holding and Transfer
CHW	Chilled Water
COM	Communications
CNDS	Condensate
CS	Combat Systems
CWA	Countermeasures Wash Down
DECK	Any Decking Work
DC	Damage Control
ENG	Engineering
MNFD	Main Feed
FDK	Flight Deck
FM	Fire Main
FO	Fuel Oil
HAB	Habitability
HDK	Hangar Deck
HPA	High Pressure Air
HULL	Hull
IC	Internal Communication
JP5	JP-5 Tanks/System

LAG	Lagging and Insulation
LC	Load Center
LO	Lube Oil
MAG	Magazine
MS	Main Steam
NSK	Non-Skid
PROP	Propulsion System, including Controllable Pitch Propeller
PW	Potable Water
SCAF	Scaffolding Required
SS	Service Steam
STRG	Steering System
STRL	Structural, General
SW	Sea Water
TIS	Temporary Industrial Systems
VEN	Vents/Ventilation
VPC	Vertical Package Conveyor
WH	Water Heaters
WEL	Weapons Elevator
WPNS	Weapons
WW	Waste Water

4.7 The following standard convention is used for identifying locations when applied to Work Activities in the IPS as directed in 3.1.7. The use of general terminology, such as "throughout ship", as a means of documenting location ***must*** be minimized.

- Space/Compartment Number (i.e. 03-130-2-L, 6-81-0-E, etc.)
- Flight and Hangar Deck Locations: deck-frame-P or S (e.g. 04-190-S or 1-190-P)
- Weather Decks: closest deck-frame-P or S (e.g. 03-140-P-WEA)
- Span of Frames: deck-frame span-P or S (e.g. for flight deck frames 55 to 100 starboard side use 04-55/100-S)
- Masts: Use mast name (e.g. Main Mast, etc.)