



EFCOG Final Report

Management of Schedule Reserve within the Integrated Master Schedule


Project Delivery Working Group

Risk Management Task Team

September 2018

Approvals

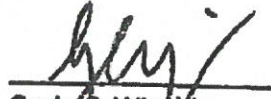
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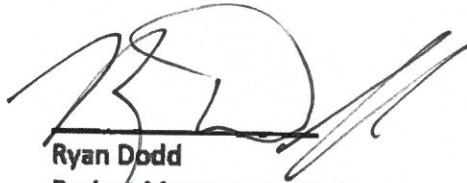
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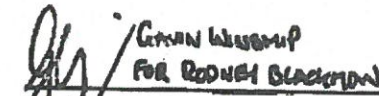
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Executive Summary

The Energy Facility Contractors Group (EFCOG) is a self-directed group of contractors of U.S. Department of Energy (DOE) Facilities. The purpose of EFCOG is to promote excellence in all aspects of operation and management of DOE facilities in a safe, environmentally sound, secure, efficient, and cost-effective manner through the ongoing exchange of information and corresponding improvement initiatives.

The EFCOG Project Management Working Subgroup (PMWSG) established a Risk Management Task Team to promote, coordinate, and facilitate the active exchange of successful Risk Management programs, practices, procedures, lessons learned, and other pertinent information of common interest that have been effectively utilized by DOE contractors and can be adapted to enhance operational excellence and cost effectiveness for continual performance improvement by other DOE contractors.

As part of the EFCOG Risk Management Task Team activities, initiatives are identified, prioritized and planned. The planned activities are established in advance of the Fiscal Year (FY) start as part of an EFCOG Project Delivery Working Group (PDWG) Annual Work Plan.

One such initiative is to develop a consistent application across the DOE complex to effectively implement, monitor, and report Schedule Reserve (SR) when implemented into the Integrated Master Schedule (IMS).

DOE G 413.3-7A Chg 1 (Admin Chg), Risk Management Guide (RMG), dated 01-12-11 provides clear definition of contractor risk ownership, and clearly documents the Risk Management (RM) processes to quantitatively establish, and monitor/evaluate SR; however, other Earned Value Management (EVM) requirements, not documented in the RMG, request supplementary information to assist in the measurement of project performance. As a result, an inconsistent application of SR was observed leading to potential findings during external reviews, or misrepresenting project commitment dates.

This final report expands on the general guidance outlined in the RMG and combines other EVM governing documents, and best practices to establish a consistent application that can be utilized by contractors to effectively implement, monitor, and report SR. This report provides a breakout of topical areas, discussions related to each area, and recommendations to effectively manage risk and uncertainty within the IMS. This report is deliverable 2.6.1 of the EFCOG PDWG FY2018 Annual Work Plan.

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Attachments

- Attachment A – Management of Schedule Margin within the Integrated Master Schedule Roadmap
- Attachment B – Comprehensive Schedule Reserve Reference Document
- Attachment C – Schedule Reserve Companion Document
- Attachment D – Survey Results

1.0 Purpose

Schedule Reserve (SR) is a risk based, quantitatively derived portion of the overall project estimate to manage time-related impacts of contractor risk and duration uncertainties within the contract period of performance. DOE G 413.3-7A Chg 1 (Admin Chg), *Risk Management Guide* (RMG), dated 01-12-11 clearly documents risk ownership, and how to quantitatively drive reserve recommendations, however specific guidance on management methods after implementation are subject to interpretation and require knowledge of other Earned Value Management (EVM) documents to effectively monitor and report SR throughout the project lifecycle. The purpose of this initiative is to investigate SR management methods, expand on the general guidance outlined in the RMG and combine other EVM governing documents and best practices to establish a consistent application that can be utilized by contractors to effectively implement, monitor, and report SR.

The EFCOG FY2018 Work Plan item 2.6.1 is shown in the following table:

EFCOGFY18 Work Plan (Extract) Item 2.6.1

2.6 Investigate the practice of managing schedule margin for baseline/PMB/Status File/Methodology	Having a uniform and best practice of managing schedule margin used throughout the DOE Complex will reduce errors, misunderstandings and minimize the potential for schedule overruns. It will enable personnel e.g., FPDs, EIR teams, ICE teams etc., to transition easily between sites and increase their effectiveness.	2.6.1 Using the roadmap issued as a deliverable in late FY17, and the results from the FY17 Risk Management survey, complete the study and issue a report with recommendations of best practices for managing schedule margin
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2.0 Methodology

A roadmap (Attachment A) was developed and utilized to assist the EFCOG Risk Management Subtask team in developing, and documenting results throughout the planning phase of this initiative. Each roadmap activity is described below.

2.1 Comprehensive Schedule Reserve Reference Document

To quantify the number of documents that contain SR requirements/best practices, a data collection process was developed to combine numerous references into a single repository (Attachment B). Having a single repository facilitated a comprehensive review of source documents that referenced SR implementation.

2.2 Identify Information Regarding Schedule Reserve Utilization

Based on the information collected from the above process, the document list was divided into three sections: document source, the referenced section of the document, and discussions related to SR. Through this process 55 items, with some overlapping information, were identified. The information obtained was further divided into topical areas that were used to develop a survey along with a companion document (Attachment C) that tied survey questions to specific document sources. The survey was then distributed to other complex-wide contractors to determine SR application across the complex. In total, ten surveys were completed and the results were presented to the EFCOG working

groups during the May 2018 Project Delivery Working Group meeting held at the Nevada Field Office (Attachment D).

2.3 Conduct Schedule Reserve Gap Analysis

Based on the results gathered, an inconsistent practice was observed. After team collaboration, eight observations were documented for additional analysis in section 3.0 Schedule Reserve Implementation. The eight observations are listed below:

- O-1, Multiple Risk Management references led to inconsistent application.
- O-2, Implementation of SR when the schedule risk analysis results extend past the contractor's period of performance (POP).
- O-3, Forecasting remaining SR when challenged with extending past POP, or enforceable/incentivized milestones.
- O-4, Terminology across DOE complex.
- O-5, Establishing policy for SR within the Earned Value System Description (EVMSD).
- O-6, Reporting requirements are not documented in DOE G 413.3-7A, Risk Management Guide.
- O-7, Implementation of DOE Schedule Contingency into IMS.
- O-8, Implementation of SR for Non-Capital Projects.

3.0 Schedule Reserve Implementation

The following sections are intended to consolidate several reference documents to effectively implement, monitor, and report SR throughout a projects lifecycle. In addition, items labeled "Things to Endorse" and "Things to Avoid" are recommended practices to encourage a cohesive integration process. The recommendations outlined are based on collaborated responses from the Risk Management community and are not intended to constitute binding DOE requirements set forth.

3.1 Reference Documentation

During the early stages of formulating this report, it was apparent that SR requirements/best practices were spread throughout a vast library. By not having expectations identified in a source document the Risk Management community relies on interpretations that lead to an inconsistent application. Although this report focuses on SR only, there are other topical areas within the Risk Management process that are subject to the same interpretations. Based on this observation it is recommended that consideration be given to expand DOE G 413.3-7A, *Risk Management Guide*, or be supplemented with an implementation guide to focus on functional areas for both Capital, and Non- Capital Asset Projects to assist in lifecycle planning. By articling documents such as the Federal Acquisition Regulation, Government Accountability Office Cost Estimating and Assessment Guide, DI-MGMT-81861A, Integrated Program Management Report, and several others, front-end planning and project monitoring could be enhanced resulting in overall project performance.

3.2 Schedule Reserve Extending Past Contractor Period of Performance

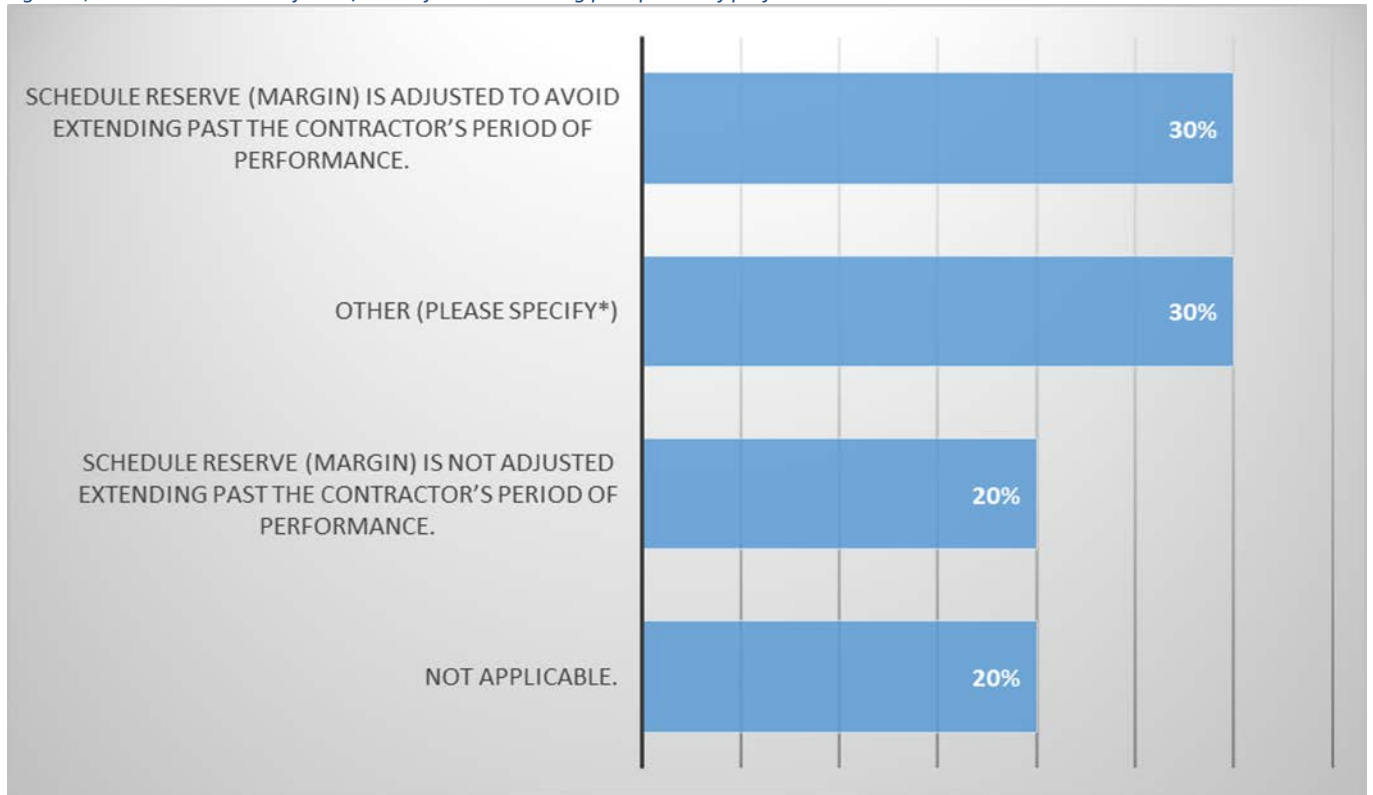
According to DOE G 413.3-7A, *Risk Management Guide* "Contractor schedule reserve does not add time or schedule duration to the contracted end date". This is well-known within the EVM community, however there are cases when the quantitatively derived portion of the overall contract schedule extends past the contractor's period of performance during the Schedule Risk Analysis or when

forecasting SR during monthly assessments. Results from the survey indicate that the above scenarios are handled very differently site-wide, and lead to noncompliance with the RMG.

How is Schedule Reserve managed for Capital Asset Projects when the quantitatively derived portion of the overall contract schedule extends past the contractor's period of performance when establishing the baseline?

Survey results are shown below in FIGURE 1.

Figure 1, Schedule Reserve adjusted/not adjusted extending past period of performance.



*Negotiate with client to extend Period of Performance, establish an Over Target Baseline, or re-plan to crash schedule with documented assumptions.

As indicated in the above chart, additional clarity of this scenario would greatly reduce interpretation, and lead to a more consistent implementation process.

Things to Endorse

- Implement SR to allow for management of time-related impacts due to risks and duration uncertainties.
- Clearly define expectations in the Contractor's Risk Management Plan and obtain Client approval.
 - Reflect SR duration past period of performance in the schedule risk analysis, however only implement through period of performance and transfer balance of SR into schedule contingency.
- Make informed decisions to re-plan and clearly document assumptions/exclusions.

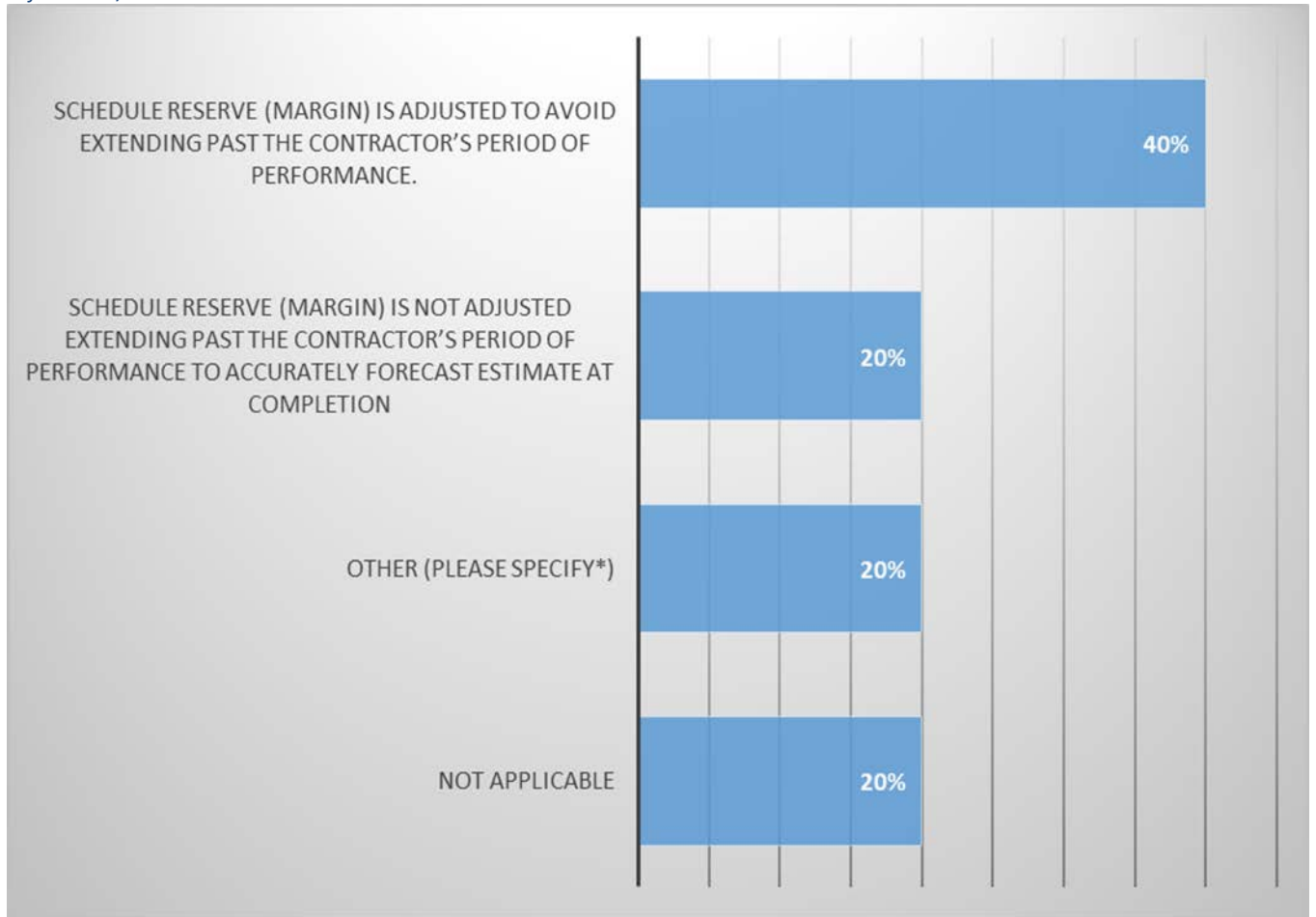
Things to Avoid

- Abandoning the application of SR.
- Arbitrarily adjusting SR to meet enforceable/incentivized milestones.
- Implementing SR past the period of performance.

How is Schedule Reserve managed for Capital Asset Projects when forecasted beyond the contractor's period of performance or enforceable/incentivized milestones?

Survey results are shown below in FIGURE 2.

Figure 2, Schedule Reserve managed for Capital Asset Projects forecasted beyond period of performance or enforceable/incentivized milestones.



*Negotiate with client to extend Period of Performance, establish an Over Target Baseline, or re-plan to crash schedule with documented assumptions.

Things to Endorse

- Represent SR in both the Baseline and Forecast schedules.
- Reflect remaining risk/uncertainty throughout the project lifecycle, even though this may extend the period of performance.
- Ensure SR is owned and controlled by the Program/Project Manager.

- Consider SR during staffing and Estimate at Completion planning.
- Increase SR, in the forecasted schedule, if additional risk/uncertainties are identified.
- Consider a baseline change request to increase reserve needs.

Things to Avoid

- Abandoning the application of SR in the forecasted IMS.
- Breaking logic to SR activity to maintain enforceable/incentivized milestone dates.
- Arbitrarily adjusting SR to meet enforceable/incentivized milestones.
- Adjusting SR duration without direction by the Program/Project Manager.

3.3 Schedule Reserve Terminology

It is important to understand the differences between DOE schedule contingency and Contractor Schedule Reserve (SR) or Schedule Margin (SM). DOE Schedule Contingency is the duration allowance used to adjust schedule for realized risks that are within the project baseline, and outside the contractor's control. Contractor SR or SM is the time allowance used to adjust schedule for realized risks within the contractor's baseline.

The terms used for contractor's allowances to manage realized risks or other events within the Integrated Master Schedule (IMS) are inconsistently used complex-wide. Although Schedule Reserve (SR) and Schedule Margin (SM) are interchangeable terms, confusion is introduced as a result of different references to describe this practice. Examples of this can be found within the RMG, National Defense Industrial Association, Planning & Scheduling Excellence Guide (PASEG), and PM-30 EVMS Compliance Protocols Desktop Instruction, respectively:

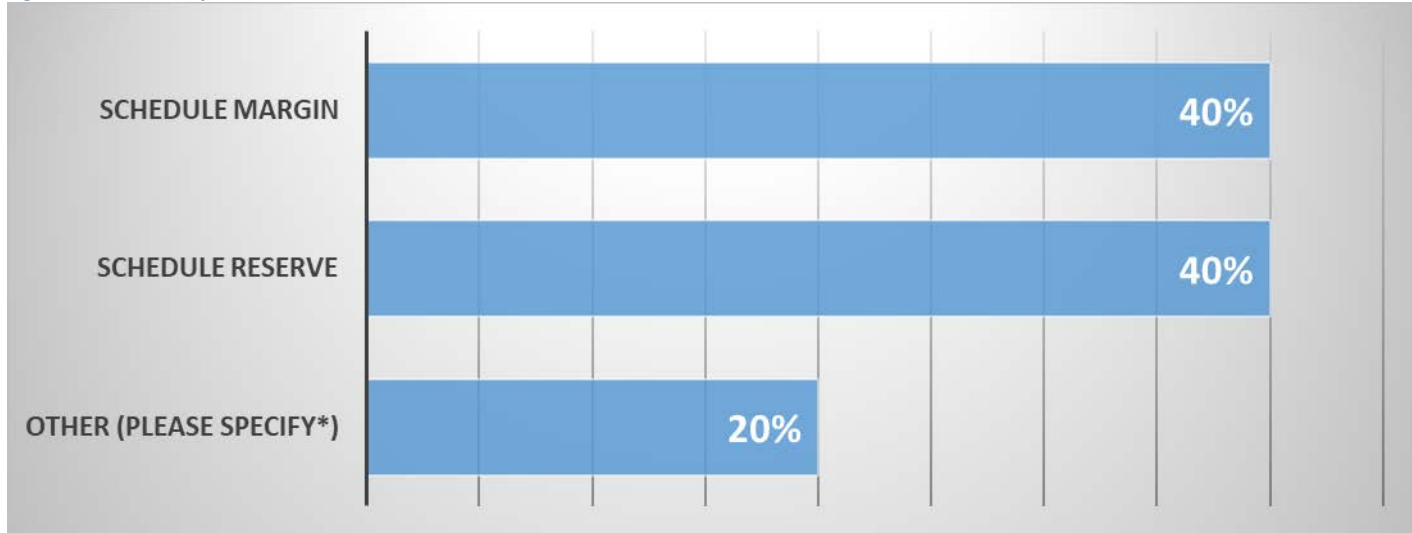
- "Schedule Reserve: Time allowance used to adjust schedule for realized risks within the contractor's baseline".
- "Schedule Margin: is an optional technique used to act as a buffer for unforeseen risks or events that could cause a delay to the project".
- "Schedule Margin duration should be the Program Manager's assessment of the amount of remaining schedule risk/uncertainty to the subsequent event".

As a result of the terms being used interchangeably there is not a consistent term used across the complex, as seen in the following:

What term is used for Schedule Reserve?

Survey results are shown below in FIGURE 3.

Figure 3, Term used for Schedule Reserve.



*Schedule contingency (contractor & federal)

Things to Endorse

- Clearly define ownership of schedule allowances (i.e., DOE Schedule Contingency versus Contractor SR/SM) within contract deliverables.
- Use consistent terminology (Schedule Reserve or Schedule Margin) when establishing contractor deliverables.

Things to Avoid

- Commingling DOE and contractor schedule allowances.
- When establishing contractor deliverables do not use SR and SM terms interchangeably.
- Use of other terms other than SR/SM for contractor schedule allowances.

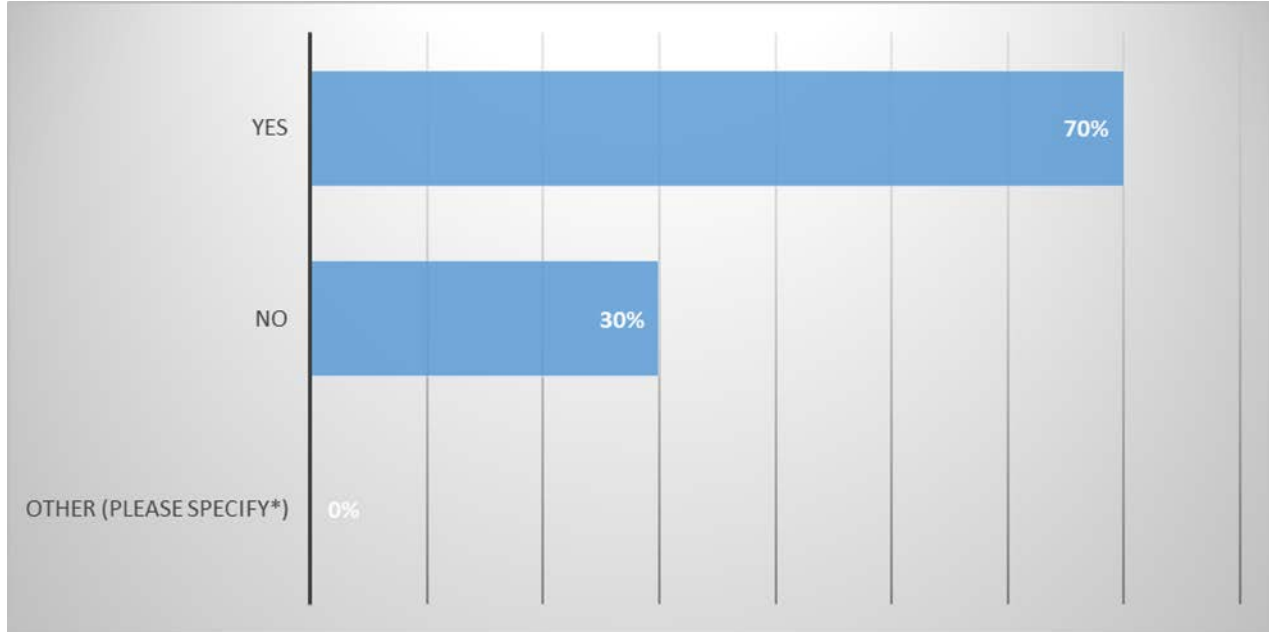
3.4 Policy within the Earned Value Management System Description

It is important to establish the policy for the development and maintenance of SR to ensure there is mutual agreement with the contractor and client. Although there are many avenues to formally obtain this agreement, the policy should be reflected in two main governing documents, the Risk Management Plan, and the EVMSD. Based on the PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION the policy should be established in the EVMSD, however inconsistent application across the site was observed.

Does the Earned Value Management System Description (EVMSD) establish the policy for the development and maintenance of Schedule Reserve?

Survey results are shown below in FIGURE 4.

Figure 4, EVMSD establishes policy for Schedule Reserve.



Things to Endorse

- Provide a summary level SR development policy within the EVMSD, and reference the contractors Risk Management Plan.
- In the Risk Management Plan, provide details on how SR will be developed and maintained.
- Use consistent terminology between the contractors EVMSD and governing Risk Management documents.

Things to Avoid

- Eliminating SR discussion in the EVMSD.
- Using inconsistent terminology.

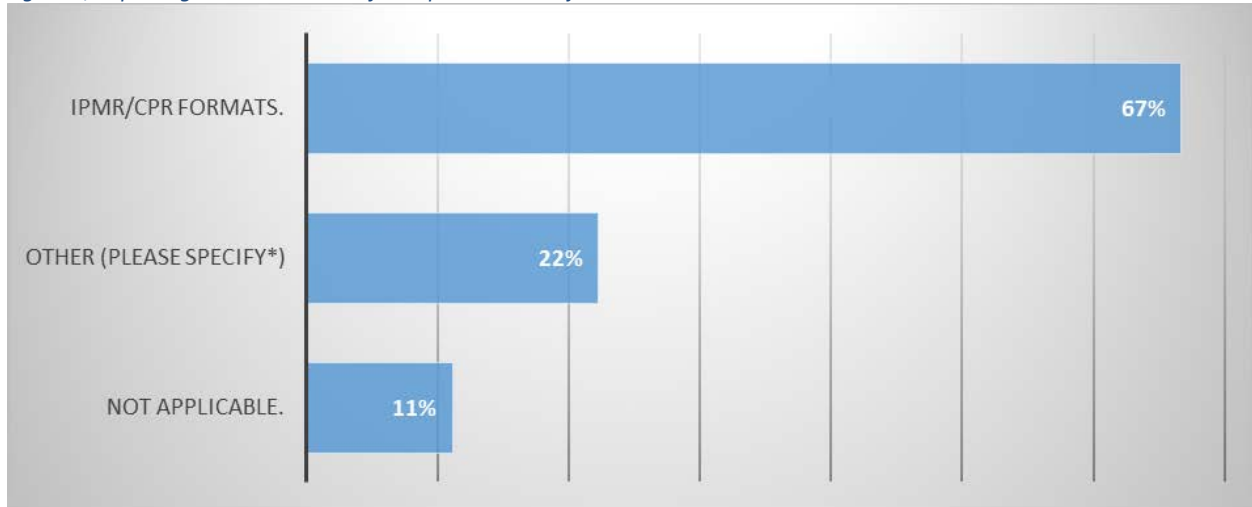
3.5 Reporting Schedule Reserve

According to DOE G 413.3-7A, Risk Management Guide “Since contractor cost and schedule reserves and DOE cost and schedule contingency are finite resources, their use should be monitored, tracked, and evaluated as part of the ongoing project control function. The reporting requirements for cost and schedule reserve and DOE cost and schedule contingency usage can be tailored to meet the project needs.” However, there are specific requirements based on the Integrated Program Management Report (IPMR) that are not captured in the RMG. By not having the IPMR referenced, inconsistent reporting was observed.

How is Schedule Reserve Reported for Capital Asset Projects?

Survey results are shown below in FIGURE 5.

Figure 5, Reporting Schedule Reserve for Capital Asset Projects.



*In the submitted IMS baseline and forecast schedules.

Things to Endorse

- Adhere to contract requirements for reporting.
- Document in the Risk Management Plan how SR will be reported to meet contract requirements and requirements set forth in the IPMR.
- In format 5 of the IPMR, discuss any changes in the duration of schedule margins for the reporting period (changes to duration include baseline or forecast).

Things to Avoid

- Excluding SR discussion in format 5 of the IPMR, or other contract deliverables.

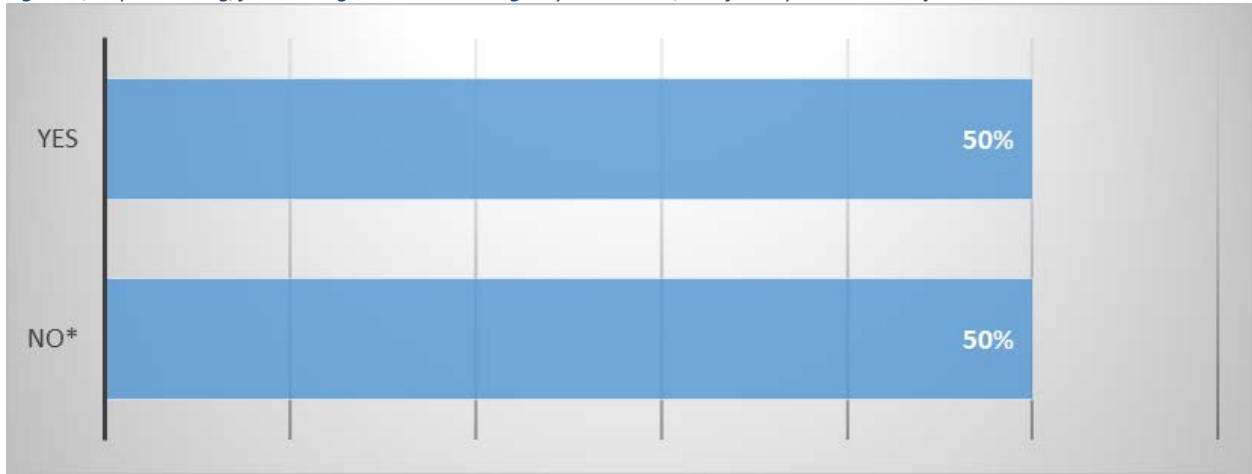
3.6 DOE Schedule Contingency

According to DOE G 413.3-7A, Risk Management Guide “DOE schedule contingency is the risk-based, quantitatively derived portion of the overall project schedule duration that is estimated to allow for the time-related risk impacts and other time-related project uncertainties. The duration of schedule contingency is typically derived based on risks that are beyond the contractor’s control and managed at the project level.” During the gap analysis, the PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION introduced implementing schedule contingency as an option. As a result of having multiple references to implement schedule contingency, inconsistent results were observed:

Is Schedule Contingency implemented in the baseline AND forecasted IMS for Capital Asset Projects?

Survey results are shown below in FIGURE 6.

Figure 6, Implementing/forecasting Schedule Contingency in baseline/IMS for Capital Asset Projects.



* DOE has elected to not implement Schedule Contingency into the contractor's IMS.

Things to Endorse

- During risk planning, discuss implementing schedule contingency into the IMS.
- Clearly document in the EVMSD, and the contractor's and DOE's Risk Management Plan how schedule contingency will be managed.
- Clearly label the schedule contingency activity and place after the contractor's final delivery.

Things to Avoid

- Abandoning the implementation of schedule contingency within the contractor's IMS.
- Commingling contractor and DOE reserve values.

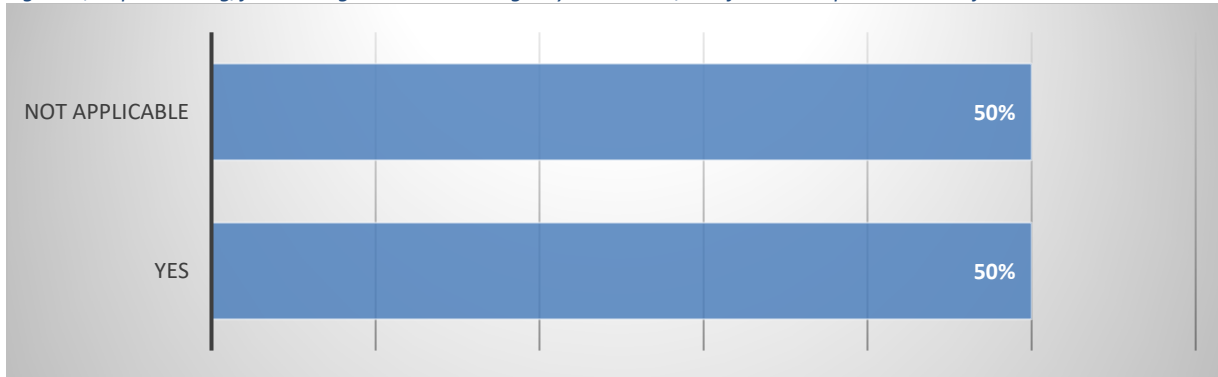
3.7 Implementation for Non-Capital Projects

With the heightened awareness of managing operations activities, it is important to establish a consistent application of SR similar to Capital Projects for projectized operations work scope. Based on the EM Policy *Requirements for Management of the Office of Environmental Management's Cleanup Program*, additional clarification on how to manage SR during the key decision phases would assist contractor's when implementing a Risk Management Program for Non-Capital Projects. As seen in the below results 50 percent of contractor's have implemented SR for Non-Capital Projects, and 50 percent of contractor's elected not to implement SR into the IMS.

Is Schedule Reserve Implemented in the baseline AND forecasted IMS for Non-Capital Asset Projects?

Survey results are shown below in FIGURE 7.

Figure 7, Implementing/forecasting Schedule Contingency in baseline/IMS for Non-Capital Asset Projects.



Things to Endorse

- During risk planning, discuss implementing SR for Non-Capital Projects into the IMS.
- Clearly document in the EVMSD, and the Risk Management Plan how SR will be managed for Non-Capital Projects.
- Clearly label the SR at the end of key decisions, similar to critical decisions.

Things to Avoid

- Abandoning the implementation of SR for Non-Capital Projects within the IMS.
- Commingling contractor and DOE reserve values.

4.0 Conclusion

Having consistent guidance across the DOE complex enables contractor's to effectively implement, monitor, and report SR. However, having several references on how to manage SR has led to an inconsistent application of SR. As demonstrated in this report an inconsistent application of SR could lead to potential findings during external reviews, or misrepresenting project commitment dates. Based on this observation it is recommended that consideration be given to expand DOE G 413.3-7A, Risk Management Guide, or be supplemented with an implementation guide to focus on functional areas for both Capital, and Non- Capital Asset Projects to assist in lifecycle planning. By articling documents such as the Federal Acquisition Regulation, Government Accountability Office Cost Estimating and Assessment Guide, DI-MGMT-81861A, Integrated Program Management Report, and several others, front-end planning and project monitoring would be enhanced resulting in overall project performance.

5.0 References

DOE G 413.3-7A Chg 1 (Admin Chg), Risk Management Guide (RMG), dated 01-12-11

EFCOG PDWG FY2018 Annual Work Plan

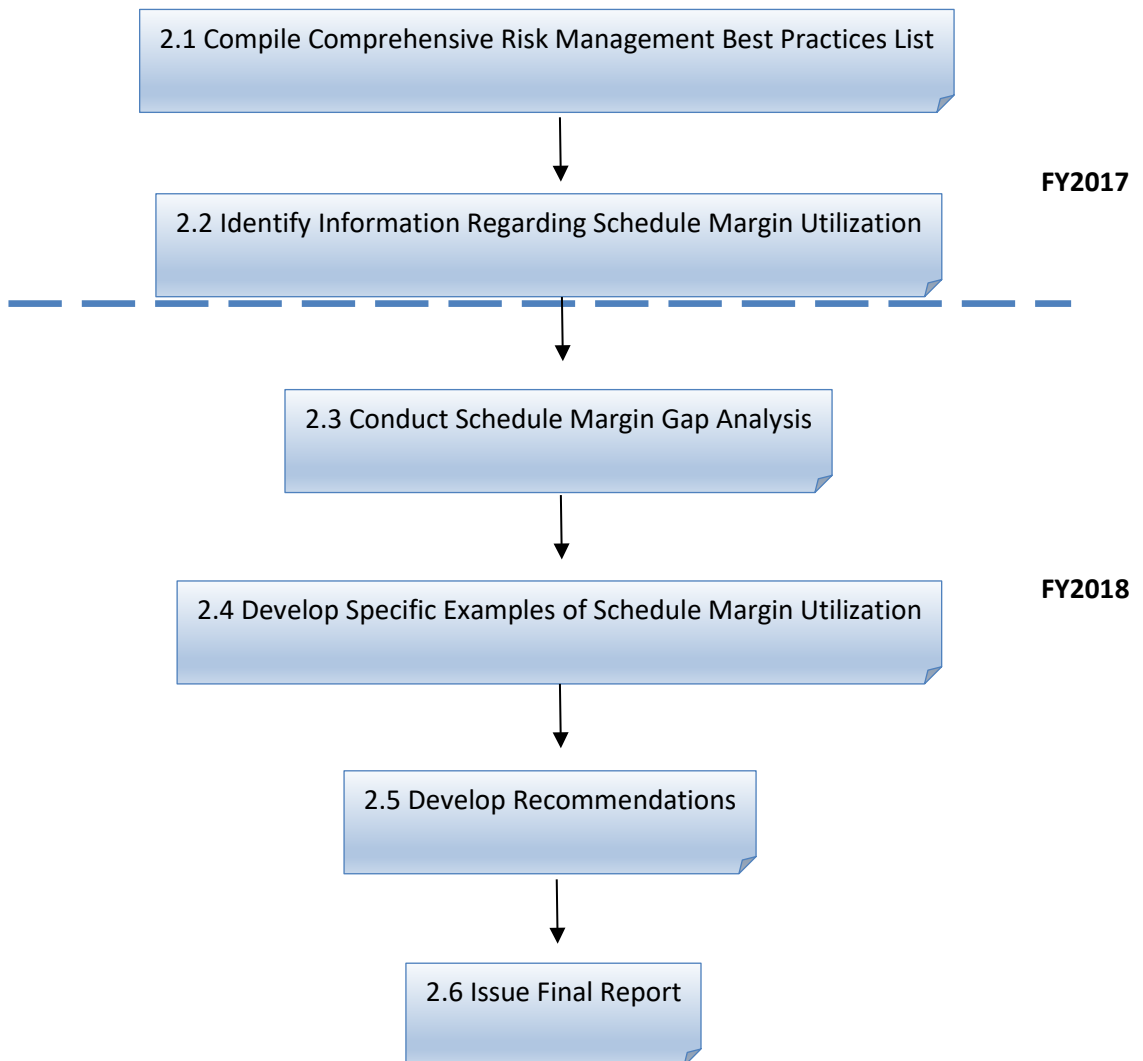
Federal Acquisition Regulation, Government Accountability Office Cost Estimating and Assessment Guide, DI-MGMT-81861A, Integrated Program Management Report (IPMR)

National Defense Industrial Association, Planning & Scheduling Excellence Guide (PASEG)

PM-30 EVMS Compliance Protocols Desktop Instruction

EM Policy Requirements for Management of the Office of Environmental Management's Cleanup Program

Attachment A – Management of Schedule Margin within the Integrated Master Schedule Roadmap



**Attachment B – Comprehensive Schedule Reserve Reference
Document**

Risk Management Schedule Reserve Matrix			
Item	Document Source	Section	Discussion
1	DOE G 413.3-7A, Risk Management Guide	413.3-7A Glossary	Schedule Reserve: Time allowance used to adjust schedule for realized risks within the contractor's baseline.
2	DOE G 413.3-7A, Risk Management Guide	Attachment 11, Risk Identification, Development and Use of Contingency and Management Reserve (Supplementary Information)	Contractor schedule reserve is determined by the contractor, and is the risk based, quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time-related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date.
3	DOE G 413.3-7A, Risk Management Guide	Attachment 11, Risk Identification, Development and Use of Contingency and Management Reserve (Supplementary Information)	The FPD may alternately choose to apply the DOE schedule contingency to the end of milestones and/or the project completion date to determine the expected completion date should project risks be realized that delay the anticipated project completion. Note that this differs from contractor schedule reserve, which cannot add time or schedule duration to the contracted end date.
4	DOE G 413.3-7A, Risk Management Guide	Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Monitoring and Evaluating	Since contractor cost and schedule reserves and DOE cost and schedule contingency are finite resources, their use should be monitored, tracked, and evaluated as part of the ongoing project control function. The reporting requirements for cost and schedule reserve and DOE cost and schedule contingency usage can be tailored to meet the project needs.
5	DOE G 413.3-7A, Risk Management Guide	Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Monitoring and Evaluating	Contractors should plan the usage of MR and schedule reserves and FPDs should plan the usage of DOE cost and schedule contingencies over time, based on the anticipated risk occurrences and impacts. MR and DOE contingency should be time-phased over the project duration, allocated by fiscal year. Trending usage of these resources may indicate larger unforeseen issues as latent risks become visible. Figure A-7 is an example of a utilization curve showing the planned and actual resource usage.
6	DOE G 413.3-7A, Risk Management Guide	Updating Contingency Analyses	Quantitative cost and schedule contingency analyses should be updated periodically throughout the project life-cycle. At a minimum, the DOE quantitative analysis should be reviewed semi-annually and updated if necessary.
7	DOE G 413.3-7A, Risk Management Guide	Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Summary of MR Reporting Elements	The following information should be considered as part of periodic project reports by the FPD: (Note: The FPD should coordinate with their program office organization about their specific guidelines and requirements which may vary depending upon the project size and complexity.) - MR and schedule reserve available at the beginning of the month. - An updated MR utilization curve. - An update of schedule reserve utilization, if applicable. - list of realized risks (threats and opportunities) that required usage of MR and schedule reserves (amount changed, Risk Identification (ID), and Title/Description of risk). - Adequacy of remaining contractor MR and schedule reserves.
8	DOE G 413.3-7A, Risk Management Guide	7.3 Project Management Approach for Non-M&O Contracts	Risks for all capital asset projects should be analyzed using a range of 70-90% confidence level upon baselining at CD-2 and reflected in funded contingency, budgetary requests, and funding profiles.
9	DOE G 413.3-21, Cost Estimating Guide	6.4.5 Contingency	Contractor schedule reserve is the risk-based quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date.
10	DOE G 413.3-21, Cost Estimating Guide	6.4.5.7 Determining Schedule Contingency	DOE schedule contingency needs to be added to the overall critical path of the project. This can be completed by applying the DOE schedule contingency incrementally before key milestones or in total before the project completion date. In this way, forecasted completion dates (individual milestones and/or overall project) can be established based on a probabilistic determination of the expected completion date should project risks be realized. This differs from contractor schedule reserve, which cannot add time or schedule duration to the contracted end date.
11	Integrated Program Management Report (IPMR) (10-25-17)	3.6.7.3. Schedule Margin	Discussion of schedule margin(s), if applicable, and any changes in the duration of schedule margins for the reporting period (changes to duration include baseline or forecast).
12	Integrated Program Management Report (IPMR) (10-25-17)	3.7.2.4. Schedule Margin	Schedule margin is an optional management method for accommodating schedule contingencies. It is a designated buffer within the schedule and does not have resources assigned to it. Schedule margin will have a baseline and be under the control of the contractor's program manager. Schedule Margin, if any, shall be placed as the last task/activity/gap at the logical end of CD-1, CD-2, or CD-4 as appropriate for the current authorization period end. The schedule margin should not drive (be a predecessor to) discrete activities. Schedule margin, if any, in the IMS shall be clearly labeled "SCHEDULE MARGIN. Discuss in Format 5 the status of schedule margin, including reasons and impacts for changes, if any.
13	PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION	6.A. SUBSECTION - SCHEDULE ARCHITECTURE	If contractor schedule margin is used, it should only be used immediately preceding a DOE Critical Decision milestone such as CD-4 and should (scope issue) be reflected in the baseline as well as the status schedules. DOE schedule contingency is optional and if used should be represented as an activity, clearly defined in the activity name as 'DOE SCHEDULE CONTINGENCY' and placed after the contractor final delivery. During the execution of the project, activities are created as required to mitigate known or discovered risks. As part of the risk management process these mitigation activities are incorporated into the baseline and forecast schedules and documented via formal change control process or ETC/EAC forecast process.
14	PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION	6.A.2.	Is schedule margin (if any) identified and logically planned in the baseline and forecast IMS?
15	PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION	6.A.2.	Discussion - Schedule margin is an optional technique used to act as a buffer for unforeseen risks or events that could cause a delay to the project. If schedule margin is used in the IMS, whether modeled using a SVT activity, or constrained milestones creating a duration gap, it must be clearly identified in the IMS. To ensure clarity, the activity name should contain the text "Schedule Margin", and a code field should be assigned to support filtering requirements of schedule analysis. Schedule Margin (SM) is used to mitigate schedule risk. The amount of SM established is directly related to management's estimation of schedule risk inherent to accomplishing the project goals and deliverables. The relationship between SM and risk in the schedule must be documented and available for review. SM may be established based upon the results of a Schedule Risk Assessment, for example. A risk register is a common repository for the project to document risks and the relationship to the amount of SM planned and baselined in the project schedule. The contractor EVM SD should establish the policy for the development and maintenance of SM. If SM is used, it must be located in the IMS as a single activity or gap between the last discrete activity in a critical decision phase, and a critical decision milestone (such as CD3 or CD-4). This placement will allow management to evaluate the impact of realized risks on the schedule to the next CD milestone, and take action to address possible to the project.

Risk Management Schedule Reserve Matrix			
Item	Document Source	Section	Discussion
16	PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION	6.A.2.	SM is established during the planning stages of the project to address the impacts of risk to the contractor's ability to complete the work on time and to meet contractual deadlines. Therefore, SM is baselined in the IMS to represent the project's schedule reserve to meet the project completion date. The duration of the SM in the baseline and forecast schedule should be equal at the start of the project, or the start of the CD phase it supports. However, as time progresses and the IMS forecast is updated, the SM may be changed at the direction of the contractor PM. SM may be consumed (over time) in the forecast schedule with monthly changes documented in the IPMR/CPR Format 5 report. This analysis should consider the rate of consumption of SM compared to the percent complete of the project. If the percentage of the SM consumption is higher than the project percent complete, it may be an indication that the risks to the project are greater than anticipated. When SM is totally consumed, it should be reflected in the schedule with a zero duration, indicating the project has no remaining schedule reserve. The duration of the SM activity may be reduced at the discretion of the contractor PM over the course of the project based on risk impacts and managerial actions. The SM activity listed on the baseline schedule is under change control requirements; however, changing the duration of the SM activity in the forecast is not subject to change control.
17	PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION	6.A.2.	Impact of Noncompliance If schedule margin is used in the schedule, its use must follow strict protocols to ensure it does not impact the validity of the critical path, and provides a realistic measure of schedule risk. Without schedule margin in the baseline schedule, management may not have the tools necessary to address and mitigate risks to the schedule.
18	GAO-16-89G, Schedule Assessment Guide	Best Practice 8: Conducting a Schedule Risk Analysis	If the program does not have sufficient schedule reserve, then risk mitigation actions and schedule issues from unforeseen events may not be managed without a schedule delay.
19	GAO-16-89G, Schedule Assessment Guide	Best Practice 8: Conducting a Schedule Risk Analysis	A baseline schedule includes margin or a reserve of extra time, referred to as schedule contingency, to account for known and quantified risks and uncertainty. The contingency represents a gap in time between the finish date of the last activity (the planned date) and the finish milestone (the committed date). When schedule contingency is depicted this way, a delay in the finish date of the predecessor activity results in a reduction of the contingency activity's duration. This reduction translates into the consumption of schedule contingency.
20	GAO-16-89G, Schedule Assessment Guide	Best Practice 8: Conducting a Schedule Risk Analysis	Finally, schedule contingency should not be represented as a lag between two activities. Lags have no descriptive name in schedules and the associated contingency may become lost within the network logic.
21	GAO-16-89G, Schedule Assessment Guide	Best Practice 8: Conducting a Schedule Risk Analysis	A schedule risk analysis compares the schedule date with that of the simulation result at a desired level of certainty and is calculated by quantifying uncertainties and risks that may affect the finish date.
22	GAO-16-89G, Schedule Assessment Guide	Best Practice 8: Conducting a Schedule Risk Analysis	A contractor should perform an SRA during the formulation of the performance measurement baseline to provide the basis for contractor schedule reserve at the desired confidence level. Preferably, an SRA is also performed before key decision points throughout the program.
23	GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs	Chapter 18, Managing Program Costs: Planning	To determine the full effect of risks on the schedule, a schedule risk analysis should be conducted to determine the level of uncertainty. A schedule risk analysis can help answer three questions that are difficult for deterministic critical path method scheduling to address: 1. How likely is it that the program will finish on or before the scheduled completion or baseline date? 2. How much schedule reserve time is needed to provide a date that satisfies the stakeholders' desires for certainty? 3. Which activities or risks are the main drivers of schedule risk and the need for schedule reserve?
24	GAO-09-3SP GAO Cost Estimating and Assessment Guide	Schedule the Work to a Timeline	Risk inherent in a schedule makes it prudent to add in schedule reserve for contingencies—a buffer for the schedule baseline. Typically, schedule reserve is calculated by conducting a schedule risk analysis, choosing a percentile that represents the organization's tolerance for overrun risk, and selecting the date that provides that degree of certainty. As a general rule, the reserve should be held by the project manager and applied as needed to activities that take longer than scheduled because of the identified risks. Reserves of time should not be apportioned in advance to any specific activity, since the risks that will actually occur and the magnitude of their impact are not known in advance.
25	GAO-09-3SP GAO Cost Estimating and Assessment Guide	Chapter 18, Schedule the Work to a Timeline	Schedule reserve is a management tool for dealing with risk and should be identified separately in the schedule baseline. It is usually defined as an activity at the end of the schedule that has no specific scope assigned, since it is not known which risks may materialize. Best practices call for schedule reserve to be allocated, based on the results of the schedule risk analysis so that high-risk activities have first priority for schedule reserve.
26	GAO-09-3SP GAO Cost Estimating and Assessment Guide	Chapter 18, Best Practices Checklist: Managing Program Costs: Planning	Schedule reserve was chosen and prioritized for high-risk activities.
27	GAO-09-3SP GAO Cost Estimating and Assessment Guide	Chapter 19, Probe Schedule Variances for Activities on the Critical Path	Schedule variances should be investigated to see if the effort is on the critical path. If it is, then the whole program will be delayed. And, as we mentioned before, any delay in the program will result in additional cost unless other measures are taken. The following methods are often used to mitigate schedule problems: - consuming schedule reserve if it is available,
28	GAO-09-3SP GAO Cost Estimating and Assessment Guide	Chapter 19, Calculate an Independent Date for Program Completion	In addition, a schedule risk analysis (described in appendix X) should be made periodically to assess changes to the critical path and explain schedule reserve erosion and mitigation strategies for keeping the program on schedule.
29	GAO-09-3SP GAO Cost Estimating and Assessment Guide	Chapter 20, Table 46: Common Indicators of Poor Program Performance	No basis for schedule reserve reductions except to absorb the effect of schedule delays
30	GAO-09-3SP GAO Cost Estimating and Assessment Guide	Chapter 18, Schedule the Work to a Timeline	From the analysis, management can make decisions about how best to handle poor schedule performance. For example, management could decide to move resources to critical path activities to improve status or allocate schedule reserve to immediately address a risk that is turning into an issue. Thus, schedule analysis is necessary for monitoring the adequacy of schedule reserve and determining whether the program can finish on time. It is also important for identifying problems early, when there is still time to act.
31	National Defense Industrial Association Integrated Program Management Division Planning & Scheduling Excellence Guide (PASEG)	5.12 Schedule Margin	There is an increased emphasis on execution to schedule resulting from both the government's initiatives on affordability and the overall changing economic climate. As such, program management teams are expected to deliver their programs on time, on target, and on cost. One optional technique available to these program management teams is the establishment of schedule margin within the IMS. Program teams can establish schedule margin by inserting a task(s) to represent the time necessary to account for estimated schedule risks/uncertainties. By accounting for schedule risk/uncertainty, the goal is to increase the accuracy of downstream forecasts.

Risk Management Schedule Reserve Matrix			
Item	Document Source	Section	Discussion
32	National Defense Industrial Association Integrated Program Management Division Planning & Scheduling Excellence Guide (PASEG)	5.12 Schedule Margin	Program teams should follow the following guidelines when using Schedule Margin: - Schedule Margin should be represented in both the Baseline and Forecast schedules - Schedule Margin tasks should be restricted to an appropriate number occurrences based on managing risk to increase schedule accuracy - Schedule Margin duration should be the Program Manager's assessment of the amount of remaining schedule risk/uncertainty to the subsequent event - Schedule Margin duration should be justifiable and traceable to the program's risk management system - Schedule Margin tasks should be clearly and consistently identifiable - Schedule Margin should be placed as the last task/activity before key contractual events, significant logical integration/test milestones, end item deliverables, or contract completion
33	National Defense Industrial Association Integrated Program Management Division Planning & Scheduling Excellence Guide (PASEG)	5.12 Schedule Margin	Things to Promote: Ensure that Schedule Margin tasks/activities are taken into consideration during resource, staffing, and EAC planning. Ensure that the impact of Schedule Margin tasks/activities is taken into consideration when executing to and analyzing the program IMS. Zero out all durations on Schedule Margin tasks during Schedule Risk Assessments. Ensure there is a comprehensive and well understood process for managing Schedule Margin that is understood by all applicable members of the government and contractor program teams. Ensure that the Schedule Margin management process and rationale for Schedule Margin durations are documented in the IMS Supplemental Guidance. While Schedule Margin duration will generally decrease over time as risks/uncertainties diminish, it is possible for the duration to increase as additional risks and uncertainties are discovered. An SRA can be used to estimate the risk/uncertainty remaining to a deliverable milestone, and thus the duration of a Schedule Margin task. For example, if the Program Manager would like to forecast a deliverable date with at least a 50% chance of occurrence, the Schedule Margin duration could be set to the difference (in working days) between the current forecast date in the IMS and the P50 date from the SRA.
34	National Defense Industrial Association Integrated Program Management Division Planning & Scheduling Excellence Guide (PASEG)	5.12 Schedule Margin	Things to Avoid: Avoid abandoning the concept of using Schedule Margin in an OTS scenario. It is equally applicable in both normal program execution and OTS situations. Avoid using Schedule Margin durations to hold a deliverable forecast to a static date. Schedule Margin should be based upon risks and uncertainties and not managerial goals.
35	National Defense Industrial Association Integrated Program Management Division Planning & Scheduling Excellence Guide (PASEG)	8.3 Task Coding	Schedule Visibility Task (SVT) Identifier - Schedule Margin Code
36	AACE® International Recommended Practice No. 75R-13 SCHEDULE AND COST RESERVES WITHIN THE FRAMEWORK OF ANSI EIA-748	Management Reserve within an ANSI EIA-748 Application	Schedule margin. Schedule margin is contingency in the units of the schedule, typically days. Schedule margin is typically within the critical path and therefore linked with the time phased baseline.
37	AACE® International Recommended Practice No. 75R-13 SCHEDULE AND COST RESERVES WITHIN THE FRAMEWORK OF ANSI EIA-748	Estimating MR	MR and schedule margin are the responsibility of the contractor's manager for that project.
38	AACE® International Recommended Practice No. 75R-13 SCHEDULE AND COST RESERVES WITHIN THE FRAMEWORK OF ANSI EIA-748	Schedule Margin	Schedule margin or schedule reserve are interchangeable terms meaning duration added to create a schedule activity to allow for the probability of possible or unforeseen events (or with a constraint to model the same - see Figures 2 and 3). It is typically based on a schedule risk assessment and is measured in the unit of the schedule (typically days). For EVM, schedule margin is usually limited to logical end points within the schedule.
39	AACE® International Recommended Practice No. 75R-13 SCHEDULE AND COST RESERVES WITHIN THE FRAMEWORK OF ANSI EIA-748	Schedule Margin	Schedule margin acts as a buffer between the projected end date of baseline activities and the project end date. It may be considered MR in time units. A good example of schedule margin may be seen in Figures 2 and 3 which illustrate a series of activities from a simple project. Figure 2 shows the planned finish date for the series of activities fifteen days prior to the contract due date. Figure 3 shows the use of schedule margin of 15 days between the scheduled completion of activities and the contract due date.

Risk Management Schedule Reserve Matrix			
Item	Document Source	Section	Discussion
40	AACE® International Recommended Practice No. 75R-13 SCHEDULE AND COST RESERVES WITHIN THE FRAMEWORK OF ANSI EIA-748	Schedule Margin	Like MR, the characteristics of schedule margin include the following: - It is owned and managed by the contractor project manager. - Its use should be accounted for in external reports. - It has no specific scope. - It usually is not allocated budget (because it has no specified scope). - It has both a duration (time budget) and remaining component. In the schedule this is called the baseline and forecast duration. - It is typically placed just in front of the project end date or may be placed before major project intermediate milestones where schedule risks typically exist. Schedule margin should be established any time a project has schedule risk. - It is usually measured in days. - It is specifically identified as schedule margin or reserve in the schedule. - It is always on the project critical path.
41	AACE® International Recommended Practice No. 75R-13 SCHEDULE AND COST RESERVES WITHIN THE FRAMEWORK OF ANSI EIA-748	Schedule Margin	There is a difference between the use of MR and schedule margin. The schedule calculates float in the forecast only. Negative float may be offset by reducing the forecast duration of schedule margin/reserve. The baseline duration for schedule margin is not changed unless there is an approved in-scope change similar to MR budget allocation. Risk may be calculated by dividing the remaining forecasted schedule margin duration by the remaining project duration and comparing that to the original baseline duration divided by the original project duration. $(\text{original baseline SM duration}) / (\text{original project duration}) = 10\%$ $(\text{forecast SM duration}) / (\text{remaining project duration}) = 5\%$ In this example the schedule margin has been used at a faster rate than expected; schedule risk is therefore increasing on the project. Expected schedule performance is generally tracked linearly, meaning at 10% project completion we would expect about 10% of the schedule margin to be consumed. As with rapidly depleting MR, if a negative trend is discovered during analysis; further investigation is recommended to determine the root cause.
42	STANDARD OPERATING PROCEDURES (SOP) Revision 2 INDEPENDENT COST REVIEW (ICR) and INDEPENDENT COST ESTIMATE (ICE) STANDARD OPERATING PROCEDURES (SOP) Revision 2	INDEPENDENT COST REVIEW (ICR) and INDEPENDENT COST ESTIMATE (ICE) STANDARD OPERATING PROCEDURES (SOP) Revision 2	Verify that the schedule margin identified is consistent with the schedule risk.
43	U.S. Department of Energy Office of Environmental Management Standing Operating Policies and Procedures (SOPP) Standing Operating Policies and Procedures (SOPP)-92	Risk Reporting	i. Establish and follow a formal risk reporting process that complies with requirements, including reporting of the use of contingency and management reserves: o ii. Report on the effectiveness of established risk handling strategies o iii. Report on the status of existing risks o iv. Establish a watch list of high priority or high impact risks and report their status to management o v. Collect and record feedback on the risk assessment process including lessons learned
44	U.S. Department of Energy Office of Environmental Management Standing Operating Policies and Procedures (SOPP) Standing Operating Policies and Procedures (SOPP)-92	Risk Planning	Establish risk management methods, including metrics and other mechanisms ii. Determine human and material resources required for risk management iii. Develop a preliminary RRAM iv. Prepare and Document a RMP that lays out the following: • Risk assessment approach (including identification and analysis) • Risk handling approach (including mitigation) • Risk monitoring approach • Risk reporting approach v. Update the Risk Management Plan at least annually
45	NASA Schedule Management Handbook	Section 5.7 Schedule Margin	It is a recommended practice that schedule margin, based on risks, duration uncertainty, and historical norms, be clearly identifiable when included within the IMS. Schedule margin may also be referred to as “schedule reserve” or “schedule contingency.” Schedule margin is owned and controlled by the Program/Project Manager. Factors that may contribute to determining the amount of schedule margin are: a) expert judgment, b) rules of thumb, c) % of overall project (or activity) duration, d) calculated by expected value of risk impacts, or e) through insight gained from a probabilistic schedule risk assessment.
46	NASA Schedule Management Handbook	Section 5.7 Schedule Margin	Schedule margin is used for future situations that are impossible to predict (for unknown unknowns). For this reason, no specified budget should be assigned to a schedule margin task because there is no known project scope involved.
47	NASA Schedule Management Handbook	Section 5.7 Schedule Margin	The preferred technique for including schedule margin in the IMS is to insert additional tasks that are specifically identified as “Schedule Margin.” These tasks should have durations assigned that provide the additional quantity of time deemed necessary to absorb the impacts of unknown schedule risks. Schedule margin must be inserted into the IMS at strategic locations so that it satisfies its intended purpose as overall schedule management margin for the project completion. To ensure this, it is recommended that this type margin be placed at the end of the IMS network logic flow just prior to hardware delivery or whatever the appropriate project completion task/milestone might be.

Risk Management Schedule Reserve Matrix			
Item	Document Source	Section	Discussion
48	NASA Schedule Management Handbook	Section 5.7 Schedule Margin	An alternative technique for managing schedule margin involves the use of milestones, constraint dates, and relationship lag values. For example, suppose there is a programmatic or contractual event commitment of concern (typically the project completion point, hardware delivery, launch, etc.). This event may be entered as a milestone in the IMS with a "Finish No Later Than" (FNLT) constraint which specifies the hard commitment date. Another companion milestone, which references the same event, may be entered as a predecessor to this event with no constraint and is labeled as the "target" for the event. The interdependency relationship connecting the two milestones should also include a specified lag value. The specified lag value represents the amount of schedule margin that is considered necessary by the project team. The schedule margin represented by this lag value is to be managed and controlled by the Project Manager.
49	NASA Schedule Management Handbook	Section 5.7 Schedule Margin	When incorporating schedule margin into the IMS, there are key guidelines that should always be addressed and maintained throughout program/project implementation. First, schedule margin should always be identifiable in the schedule. Second, schedule margin should be managed and controlled by the Program/Project Manager. Third, since no budget should be assigned to schedule margin, an adequate amount of management reserve must be available to cover this added duration.
50	NASA Schedule Management Handbook	Section 5.8 Schedule Risk and Uncertainty	(In Reference to performing an SRA and the Confidence Intervals which are the outcome of the SRA) . . . These percentages will aid the management team in determining an adequate amount of schedule margin to be included in the schedule before baselining.
51	NASA Schedule Management Handbook	5.8.5 Baseline Approval	The final review should also ensure that there is adequate schedule margin and that it is clearly identified as such in the project schedule. One method of ensuring this is to perform a schedule risk assessment (SRA) prior to approving the baseline.
52	NASA Schedule Management Handbook	9.2.6 Schedule Margin Metrics	Each program/project should develop and make available a report clearly showing the trend for schedule margin usage over the life of the program/project. Any change between reporting periods should also be clearly explained.
53	REQUIREMENTS FOR MANAGEMENT OF THE OFFICE OF ENVIRONMENTAL MANAGEMENT'S CLEANUP PROGRAM	4. Key Decision Authorizations and Thresholds	GAO best practices to be used for development of cost and schedule estimates prior to KD-2
54	REQUIREMENTS FOR MANAGEMENT OF THE OFFICE OF ENVIRONMENTAL MANAGEMENT'S CLEANUP PROGRAM	4. Key Decision Authorizations and Thresholds	No DOE contingency should be included in the segment's baseline or contingency funding requested in advance (except for that approved for capital projects). If risks are realized for non-capital work, the decision authority under change control procedures must formally approve any associated mitigation strategies and determine if additional funding will be made available. Realized risks should be addressed, first if possible, from cleanup work efficiencies within the contract or reprioritization of previously approved contract scope, or lastly, from additional funds provided to the contractor following change control procedures.
55	REQUIREMENTS FOR MANAGEMENT OF THE OFFICE OF ENVIRONMENTAL MANAGEMENT'S CLEANUP PROGRAM	5. Principles	The Contract Performance Baseline (CPB) must satisfy all applicable requirements for safety, quality, regulatory milestones, budget, schedule, contract scope of work, and risk management as stated in the contract.

Attachment C – Schedule Reserve Companion Document

Schedule Reserve Companion Document

Item	Question	Source	Section	Discussion
1	What term is used for Schedule Reserve (Margin)?	<ul style="list-style-type: none"> DOE G 413.3-7A, Risk Management Guide PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION AACE® International Recommended Practice No. 75R-13 	<ul style="list-style-type: none"> Attachment 15: Glossary 6.A.2 Schedule Margin 	<ul style="list-style-type: none"> Schedule Reserve: Time allowance used to adjust schedule for realized risks within the contractor's baseline. Schedule margin is an optional technique used to act as a buffer for unforeseen risks or events that could cause a delay to the project. If schedule margin is used in the Integrated Master Schedule (IMS), whether modeled using a Schedule Visibility Task (SVT) activity, or constrained milestones creating a duration gap, it must be clearly identified in the IMS. To ensure clarity, the activity name <u>should</u> contain the text "Schedule Margin", and a code field should be assigned to support filtering requirements of schedule analysis. Schedule margin or schedule reserve are interchangeable terms meaning duration added to create a schedule activity to allow for the probability of possible or unforeseen events.
2	Does the Earned Value Management System Description (EVM SD) establish the policy for the development and maintenance of Schedule Reserve (Margin)?	<ul style="list-style-type: none"> PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION 	<ul style="list-style-type: none"> 6.A.2 	<ul style="list-style-type: none"> Schedule Margin (SM) is used to mitigate schedule risk. The amount of SM established is directly related to management's estimation of schedule risk inherent to accomplishing the project goals and deliverables. The relationship between SM and risk in the schedule must be documented and available for review. SM may be established based upon the results of a Schedule Risk Assessment, for example. A risk register is a common repository for the project to document risks and the relationship to the amount of SM planned and baselined in the project schedule. The contractor EVM SD <u>should</u> establish the policy for the development and maintenance of SM. If SM is used, it must be located in the IMS as a single activity or gap between the last discrete activity in a critical decision phase, and a critical decision milestone (such as CD-3 or CD-4). This placement will allow management to evaluate the impact of realized risks on the schedule to the next CD milestone, and take action to address possible to the project.
3	How is Schedule Reserve (Margin) determined for Capital Asset Projects?	<ul style="list-style-type: none"> DOE G 413.3-7A, Risk Management Guide GAO Schedule Assessment Guide STANDARD OPERATING PROCEDURES (SOP) Revision 2 SCHEDULE AND COST RESERVES WITHIN THE FRAMEWORK OF ANSI EIA-748 NASA Schedule Management Handbook 	<ul style="list-style-type: none"> Attachment 11, Risk Identification, Development and Use of Contingency and Management Reserve (Supplementary Information) Best Practice 8: Conducting a Schedule Risk Analysis INDEPENDENT COST REVIEW (ICR) and INDEPENDENT COST ESTIMATE (ICE) STANDARD OPERATING PROCEDURES (SOP) Revision 2 Estimating MR Section 5.8 Schedule Risk and Uncertainty Chapter 18, Schedule the Work to a Timeline 5.8.5 Baseline Approval Schedule the Work to a Timeline 	<ul style="list-style-type: none"> Contractor schedule reserve is determined by the contractor, and is the risk based, quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time-related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date. A contractor should perform an SRA during the formulation of the performance measurement baseline to provide the basis for contractor schedule reserve at the desired confidence level. Preferably, an SRA is also performed before key decision points throughout the program. If the program does not have sufficient schedule reserve, then risk mitigation actions and schedule issues from unforeseen events may not be managed without a schedule delay. Verify that the schedule margin identified is consistent with the schedule risk. MR and schedule margin are the responsibility of the contractor's manager for that project. (In Reference to performing an SRA and the Confidence Intervals which are the outcome of the SRA) . . . These percentages will aid the management team in determining an adequate amount of schedule margin to be included in the schedule before baselining. From the analysis, management can make decisions about how best to handle poor schedule performance. For example, management could decide to move resources to critical path activities to improve status or allocate schedule reserve to immediately address a risk that is turning into an issue. Thus, schedule analysis is necessary for monitoring the adequacy of schedule reserve and determining whether the program can finish on time. It is also important for identifying problems early, when there is still time to act. The final review should also ensure that there is adequate schedule margin and that it is clearly identified as such in the project schedule. One method of ensuring this is to perform a schedule risk assessment (SRA) prior to approving the baseline. Typically, schedule reserve is calculated by conducting a schedule risk analysis, choosing a percentile that represents the organization's tolerance for overrun risk, and selecting the date that provides that degree of certainty.

4	Is Schedule Reserve (Margin) Implemented in the baseline AND forecasted IMS for Capital Asset Projects?	<ul style="list-style-type: none"> • DOE G 413.3-7A, Risk Management Guide • PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION • Planning & Scheduling Excellence Guide (PASEG) • NASA Schedule Management Handbook 	<ul style="list-style-type: none"> • Attachment 11, Risk Identification, Development and Use of Contingency and Management Reserve (Supplementary Information) • 6.A.2 • 7.3 Project Management Approach for Non-M&O Contracts • 5.12 Schedule Margin • Section 5.7 Schedule Margin 	<ul style="list-style-type: none"> • Contractor schedule reserve is determined by the contractor, and is the risk based, quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time-related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date. • If SM is used, it must be located in the IMS as a single activity or gap between the last discrete activity in a critical decision phase, and a critical decision milestone (such as CD-3 or CD-4). • Schedule margin is an optional technique used to act as a buffer for unforeseen risks or events that could cause a delay to the project. If schedule margin is used in the IMS, whether modeled using a SVT activity, or constrained milestones creating a duration gap, it must be clearly identified in the IMS. To ensure clarity, the activity name should contain the text "Schedule Margin", and a code field should be assigned to support filtering requirements of schedule analysis. • Risks for all capital asset projects should be analyzed using a range of 70-90% confidence level upon baselining at CD-2 and reflected in funded contingency, budgetary requests, and funding profiles. • There is an increased emphasis on execution to schedule resulting from both the government's initiatives on affordability and the overall changing economic climate. As such, program management teams are expected to deliver their programs on time, on target, and on cost. One optional technique available to these program management teams is the establishment of schedule margin within the IMS. • An alternative technique for managing schedule margin involves the use of milestones, constraint dates, and relationship lag values. For example, suppose there is a programmatic or contractual event commitment of concern (typically the project completion point, hardware delivery, launch, etc.). This event may be entered as a milestone in the IMS with a "Finish No Later Than" (FNL) constraint which specifies the hard commitment date. Another companion milestone, which references the same event, may be entered as a predecessor to this event with no constraint and is labeled as the "target" for the event. The interdependency relationship connecting the two milestones should also include a specified lag value. The specified lag value represents the amount of schedule margin that is considered necessary by the project team. The schedule margin represented by this lag value is to be managed and controlled by the Project Manager.
5	Is Schedule Contingency implemented in the baseline AND forecasted IMS for Capital Asset Projects?	<ul style="list-style-type: none"> • PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION • DOE G 413.3-7A, Risk Management Guide • GAO-16-89G, Schedule Assessment Guide 	<ul style="list-style-type: none"> • 6.A. SUBSECTION - SCHEDULE ARCHITECTURE • Attachment 11, Risk Identification, Development and Use of Contingency and Management Reserve (Supplementary Information) • Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Monitoring and Evaluating • Best Practice 8: Conducting a Schedule Risk Analysis 	<ul style="list-style-type: none"> • If contractor schedule margin is used, it should only be used immediately preceding a DOE Critical Decision milestone such as CD-4 and should (scope issue) be reflected in the baseline as well as the status schedules. DOE schedule contingency is optional and if used should be represented as an activity, clearly defined in the activity name as 'DOE SCHEDULE CONTINGENCY' and placed after the contractor final delivery. During the execution of the project, activities are created as required to mitigate known or discovered risks. As part of the risk management process these mitigation activities are incorporated into the baseline and forecast schedules and documented via formal change control process or ETC/EAC forecast process. • The FPD may alternately choose to apply the DOE schedule contingency to the end of milestones and/or the project completion date to determine the expected completion date should project risks be realized that delay the anticipated project completion. Note that this differs from contractor schedule reserve, which cannot add time or schedule duration to the contracted end date. • Contractors should plan the usage of MR and schedule reserves and FPDs should plan the usage of DOE cost and schedule contingencies over time, based on the anticipated risk occurrences and impacts. MR and DOE contingency should be time-phased over the project duration, allocated by fiscal year. Trending usage of these resources may indicate larger unforeseen issues as latent risks become visible. • Finally, schedule contingency should not be represented as a lag between two activities. Lags have no descriptive name in schedules and the associated contingency may become lost within the network logic.

6	How is Schedule Reserve (Margin) determined for Non-Capital Asset Projects?	<ul style="list-style-type: none"> • DOE G 413.3-7A, Risk Management Guide • GAO-16-89G, Schedule Assessment Guide • REQUIREMENTS FOR MANAGEMENT OF THE OFFICE OF ENVIRONMENTAL MANAGEMENT'S CLEANUP PROGRAM • INDEPENDENT COST REVIEW (ICR) and INDEPENDENT COST ESTIMATE (ICE) STANDARD OPERATING PROCEDURES (SOP) Revision 2 • NASA Schedule Management Handbook • GAO-09-3SP GAO Cost Estimating and Assessment Guide • Standing Operating Policies and Procedures (SOPP)-92 	<ul style="list-style-type: none"> • Attachment 11, Risk Identification, Development and Use of Contingency and Management Reserve (Supplementary Information) • Best Practice 8: Conducting a Schedule Risk Analysis • 4. Key Decision Authorizations and Thresholds • 5. Principles • INDEPENDENT COST REVIEW (ICR) and INDEPENDENT COST ESTIMATE (ICE) STANDARD OPERATING PROCEDURES (SOP) Revision 2 • Section 5.8 Schedule Risk and Uncertainty • 5.8.5 Baseline Approval • Chapter 18, Schedule the Work to a Timeline 	<ul style="list-style-type: none"> • Contractor schedule reserve is determined by the contractor, and is the risk based, quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time-related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date. • A contractor should perform an SRA during the formulation of the performance measurement baseline to provide the basis for contractor schedule reserve at the desired confidence level. Preferably, an SRA is also performed before key decision points throughout the program. • If the program does not have sufficient schedule reserve, then risk mitigation actions and schedule issues from unforeseen events may not be managed without a schedule delay. • GAO best practices to be used for development of cost and schedule estimates prior to KD-2 • No DOE contingency should be included in the segment's baseline or contingency funding requested in advance (except for that approved for capital projects). If risks are realized for non-capital work, the decision authority under change control procedures must formally approve any associated mitigation strategies and determine if additional funding will be made available. Realized risks should be addressed, first if possible, from cleanup work efficiencies within the contract or reprioritization of previously approved contract scope, or lastly, from additional funds provided to the contractor following change control procedures. • The Contract Performance Baseline (CPB) must satisfy all applicable requirements for safety, quality, regulatory milestones, budget, schedule, contract scope of work, and risk management as stated in the contract. • Verify that the schedule margin identified is consistent with the schedule risk. • (In Reference to performing an SRA and the Confidence Intervals which are the outcome of the SRA) . . . These percentages will aid the management team in determining an adequate amount of schedule margin to be included in the schedule before baselining. • The final review should also ensure that there is adequate schedule margin and that it is clearly identified as such in the project schedule. One method of ensuring this is to perform a schedule risk assessment (SRA) prior to approving the baseline. • From the analysis, management can make decisions about how best to handle poor schedule performance. For example, management could decide to move resources to critical path activities to improve status or allocate schedule reserve to immediately address a risk that is turning into an issue. Thus, schedule analysis is necessary for monitoring the adequacy of schedule reserve and determining whether the program can finish on time. It is also important for identifying problems early, when there is still time to act.
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7	Is Schedule Reserve (Margin) Implemented in the baseline AND forecasted IMS for Non-Capital Asset Projects?	<ul style="list-style-type: none"> • DOE G 413.3-7A, Risk Management Guide • GAO-16-89G, Schedule Assessment Guide • REQUIREMENTS FOR MANAGEMENT OF THE OFFICE OF ENVIRONMENTAL MANAGEMENT'S CLEANUP PROGRAM • INDEPENDENT COST REVIEW (ICR) and INDEPENDENT COST ESTIMATE (ICE) STANDARD OPERATING PROCEDURES (SOP) Revision 2 • NASA Schedule Management Handbook • GAO-09-3SP GAO Cost Estimating and Assessment Guide 	<ul style="list-style-type: none"> • Attachment 11, Risk Identification, Development and Use of Contingency and Management Reserve (Supplementary Information) • Best Practice 8: Conducting a Schedule Risk Analysis • 4. Key Decision Authorizations and Thresholds • 5. Principles • INDEPENDENT COST REVIEW (ICR) and INDEPENDENT COST ESTIMATE (ICE) STANDARD OPERATING PROCEDURES (SOP) Revision 2 • Section 5.8 Schedule Risk and Uncertainty • 5.8.5 Baseline Approval • Chapter 18, Schedule the Work to a Timeline 	<ul style="list-style-type: none"> • Contractor schedule reserve is determined by the contractor, and is the risk based, quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time-related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date. • A contractor should perform an SRA during the formulation of the performance measurement baseline to provide the basis for contractor schedule reserve at the desired confidence level. Preferably, an SRA is also performed before key decision points throughout the program. • If the program does not have sufficient schedule reserve, then risk mitigation actions and schedule issues from unforeseen events may not be managed without a schedule delay. • GAO best practices to be used for development of cost and schedule estimates prior to KD-2 • No DOE contingency should be included in the segment's baseline or contingency funding requested in advance (except for that approved for capital projects). If risks are realized for non-capital work, the decision authority under change control procedures must formally approve any associated mitigation strategies and determine if additional funding will be made available. Realized risks should be addressed, first if possible, from cleanup work efficiencies within the contract or reprioritization of previously approved contract scope, or lastly, from additional funds provided to the contractor following change control procedures. • The Contract Performance Baseline (CPB) must satisfy all applicable requirements for safety, quality, regulatory milestones, budget, schedule, contract scope of work, and risk management as stated in the contract. • Verify that the schedule margin identified is consistent with the schedule risk. • (In Reference to performing an SRA and the Confidence Intervals which are the outcome of the SRA) . . . These percentages will aid the management team in determining an adequate amount of schedule margin to be included in the schedule before baselining. • The final review should also ensure that there is adequate schedule margin and that it is clearly identified as such in the project schedule. One method of ensuring this is to perform a schedule risk assessment (SRA) prior to approving the baseline. • From the analysis, management can make decisions about how best to handle poor schedule performance. For example, management could decide to move resources to critical path activities to improve status or allocate schedule reserve to immediately address a risk that is turning into an issue. Thus, schedule analysis is necessary for monitoring the adequacy of schedule reserve and determining whether the program can finish on time. It is also important for identifying problems early, when there is still time to act.
8	Is Schedule Contingency implemented in the baseline AND forecasted IMS for Non-Capital Asset Projects?	<ul style="list-style-type: none"> • REQUIREMENTS FOR MANAGEMENT OF THE OFFICE OF ENVIRONMENTAL MANAGEMENT'S CLEANUP PROGRAM • Standing Operating Policies and Procedures (SOPP)-92 	<ul style="list-style-type: none"> • 4. Key Decision Authorizations and Thresholds • Risk Assessment 	<ul style="list-style-type: none"> • No DOE contingency should be included in the segment's baseline or contingency funding requested in advance (except for that approved for capital projects). If risks are realized for non-capital work, the decision authority under change control procedures must formally approve any associated mitigation strategies and determine if additional funding will be made available. Realized risks should be addressed, first if possible, from cleanup work efficiencies within the contract or reprioritization of previously approved contract scope, or lastly, from additional funds provided to the contractor following change control procedures.
9	Does Schedule Reserve (Margin) Have budget associated with it?	<ul style="list-style-type: none"> • AACE® International Recommended Practice. No. 75R-13 • NASA Schedule Management Handbook 	<ul style="list-style-type: none"> • Schedule Margin • Section 5.4 – Schedule Margin 	<ul style="list-style-type: none"> • It usually is not allocated budget (because it has no specified scope). • Schedule margin is used for future situations that are impossible to predict (for unknown unknowns). For this reason, no specified budget should be assigned to a schedule margin task because there is no known project scope involved. • Since no budget should be assigned to schedule margin, an adequate amount of management reserve must be available to cover this added duration.
10	How is established Schedule Reserve (Margin) handled when running a risk analysis?	<ul style="list-style-type: none"> • Planning & Scheduling Excellence Guide (PASEG) • GAO Schedule Assessment Guide • GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs 	<ul style="list-style-type: none"> • Section 5.12, Schedule Margin • Best Practice 8: Conducting a Schedule Risk Analysis • Chapter 18, Managing Program Costs: Planning 	<ul style="list-style-type: none"> • Zero out all durations on Schedule Margin tasks during Schedule Risk Assessments. • A schedule risk analysis compares the schedule date with that of the simulation result at a desired level of certainty and is calculated by quantifying uncertainties and risks that may affect the finish date. • To determine the full effect of risks on the schedule, a schedule risk analysis should be conducted to determine the level of uncertainty.

11	How often is Schedule Reserve (Margin) evaluated?	<ul style="list-style-type: none"> DOE Risk Management Guide PM-30 EVMS COMPLIANCE Planning & Scheduling Excellence Guide (PASEG) GAO-09-3SP GAO Cost Estimating and Assessment Guide 	<ul style="list-style-type: none"> Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Monitoring and Evaluating 6.A.2 Section 5.12, Schedule Margin Updating Contingency Analyses Chapter 19, Calculate an Independent Date for Program Completion 	<ul style="list-style-type: none"> Since contractor cost and schedule reserves and DOE cost and schedule contingency are finite resources, their use should be monitored, tracked, and evaluated as part of the ongoing project control function. The reporting requirements for cost and schedule reserve and DOE cost and schedule contingency usage can be tailored to meet the project needs. The duration of the SM activity may be reduced at the discretion of the contractor PM over the course of the project based on risk impacts and managerial actions. The SM activity listed on the baseline schedule is under change control requirements; however, changing the duration of the SM activity in the forecast is not subject to change control. Avoid using Schedule Margin durations to hold a deliverable forecast to a static date. Schedule Margin should be based upon risks and uncertainties and not managerial goals. Quantitative cost and schedule contingency analyses should be updated periodically throughout the project life-cycle. At a minimum, the DOE quantitative analysis should be reviewed semi-annually and updated if necessary. A schedule risk analysis (described in appendix X) should be made periodically to assess changes to the critical path and explain schedule reserve erosion and mitigation strategies for keeping the program on schedule.
12	How is Schedule Reserve (Margin) utilized within the Forecasted Capital Asset Project IMS?	<ul style="list-style-type: none"> Planning & Scheduling Excellence Guide (PASEG) GAO-09-3SP GAO Cost Estimating and Assessment Guide PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION 	<ul style="list-style-type: none"> Section 5.12, Schedule Margin Chapter 20, Table 46: Common Indicators of Poor Program Performance 6.A.2. Chapter 19, Probe Schedule Variances for Activities on the Critical Path 	<ul style="list-style-type: none"> Avoid using Schedule Margin durations to hold a deliverable forecast to a static date. Schedule Margin should be based upon risks and uncertainties and not managerial goals. No basis for schedule reserve reductions except to absorb the effect of schedule delays. If schedule margin is used in the schedule, its use must follow strict protocols to ensure it does not impact the validity of the critical path, and provides a realistic measure of schedule risk. Without schedule margin in the baseline schedule, management may not have the tools necessary to address and mitigate risks to the schedule. Schedule variances should be investigated to see if the effort is on the critical path. If it is, then the whole program will be delayed. And, as we mentioned before, any delay in the program will result in additional cost unless other measures are taken. The following methods are often used to mitigate schedule problems: <ul style="list-style-type: none"> - consuming schedule reserve if it is available
13	How is Schedule Reserve (Margin) utilized within the Forecasted IMS for Non-Capital Asset Projects?	<ul style="list-style-type: none"> Planning & Scheduling Excellence Guide (PASEG) GAO-09-3SP GAO Cost Estimating and Assessment Guide PM-30 EVMS COMPLIANCE PROTOCOLS DESKTOP INSTRUCTION 	<ul style="list-style-type: none"> Section 5.12, Schedule Margin Chapter 20, Table 46: Common Indicators of Poor Program Performance 6.A.2. Chapter 19, Probe Schedule Variances for Activities on the Critical Path 	<ul style="list-style-type: none"> Avoid using Schedule Margin durations to hold a deliverable forecast to a static date. Schedule Margin should be based upon risks and uncertainties and not managerial goals. No basis for schedule reserve reductions except to absorb the effect of schedule delays. If schedule margin is used in the schedule, its use must follow strict protocols to ensure it does not impact the validity of the critical path, and provides a realistic measure of schedule risk. Without schedule margin in the baseline schedule, management may not have the tools necessary to address and mitigate risks to the schedule. Schedule variances should be investigated to see if the effort is on the critical path. If it is, then the whole program will be delayed. And, as we mentioned before, any delay in the program will result in additional cost unless other measures are taken. The following methods are often used to mitigate schedule problems: <ul style="list-style-type: none"> - consuming schedule reserve if it is available
14	How is Schedule Reserve (Margin) managed for Capital Asset Projects when the quantitatively derived portion of the overall contract schedule extends past the contractor's period of performance when establishing the baseline?	<ul style="list-style-type: none"> DOE G 413.3-21, Cost Estimating Guide 	<ul style="list-style-type: none"> 6.4.5 Contingency 6.4.5.7 Determining Schedule Contingency 	<ul style="list-style-type: none"> Contractor schedule reserve is the risk-based quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date. DOE schedule contingency needs to be added to the overall critical path of the project. This differs from contractor schedule reserve, which cannot add time or schedule duration to the contracted end date.

15	How is Schedule Reserve (Margin) managed for Non-Capital Asset Projects when the quantitatively derived portion of the overall contract schedule extends past the contractor's period of performance when establishing the baseline?	<ul style="list-style-type: none"> DOE G 413.3-21, Cost Estimating Guide 	<ul style="list-style-type: none"> 6.4.5 Contingency 6.4.5.7 Determining Schedule Contingency 	<ul style="list-style-type: none"> Contractor schedule reserve is the risk-based quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date. DOE schedule contingency needs to be added to the overall critical path of the project. This differs from contractor schedule reserve, which cannot add time or schedule duration to the contracted end date.
16	How is Schedule Reserve (Margin) managed for Capital Asset Projects when forecasted beyond the contractor's period of performance or enforceable/incentivized milestones?	<ul style="list-style-type: none"> DOE G 413.3-21, Cost Estimating Guide 	<ul style="list-style-type: none"> 6.4.5 Contingency 	<ul style="list-style-type: none"> Contractor schedule reserve is determined by the contractor, and is the risk based, quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time-related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date.
17	How is Schedule Reserve (Margin) managed for Non-Capital Asset Projects when forecasted beyond the contractor's period of performance or enforceable/incentivized milestones?	<ul style="list-style-type: none"> DOE G 413.3-21, Cost Estimating Guide 	<ul style="list-style-type: none"> 6.4.5 Contingency 	<ul style="list-style-type: none"> Contractor schedule reserve is determined by the contractor, and is the risk based, quantitatively derived portion of the overall contract schedule duration estimated to allow the contractor time to manage the time-related impacts of contractor execution risks and other contractor duration uncertainties within the contract period. Contractor schedule reserve does not add time or schedule duration to the contracted end date.
18	What tool is used to represent Schedule Reserve (Margin) Utilization for Capital Asset Projects?	<ul style="list-style-type: none"> DOE G 413.3-7A, Risk Management Guide 	<ul style="list-style-type: none"> Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Monitoring and Evaluating 	<ul style="list-style-type: none"> Contractors should plan the usage of MR and schedule reserves and FPDs should plan the usage of DOE cost and schedule contingencies over time, based on the anticipated risk occurrences and impacts. MR and DOE contingency should be time-phased over the project duration, allocated by fiscal year. Trending usage of these resources may indicate larger unforeseen issues as latent risks become visible. Figure A-7 is an example of a utilization curve showing the planned and actual resource usage.
19	What tool is used to represent Schedule Reserve (Margin) Utilization for Non-Capital Asset Projects?	<ul style="list-style-type: none"> DOE G 413.3-7A, Risk Management Guide 	<ul style="list-style-type: none"> Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Monitoring and Evaluating 	<ul style="list-style-type: none"> Contractors should plan the usage of MR and schedule reserves and FPDs should plan the usage of DOE cost and schedule contingencies over time, based on the anticipated risk occurrences and impacts. MR and DOE contingency should be time-phased over the project duration, allocated by fiscal year. Trending usage of these resources may indicate larger unforeseen issues as latent risks become visible. Figure A-7 is an example of a utilization curve showing the planned and actual resource usage.

20	How is Schedule Reserve (Margin) Reported for Capital Asset Projects?	<ul style="list-style-type: none"> • NASA Schedule Management Handbook • Integrated Program Management Report (IPMR) (10-25-17) • DOE G 413.3-7A, Risk Management Guide 	<ul style="list-style-type: none"> • 9.2.6 Schedule Margin Metrics • 3.6.7.3. Schedule Margin • Attachment 14, Management and Reporting of MR and Contingency (Supplementary Information) - Summary of MR Reporting Elements 	<ul style="list-style-type: none"> • Each program/project should develop and make available a report clearly showing the trend for schedule margin usage over the life of the program/project. Any change between reporting periods should also be clearly explained. • Discussion of schedule margin(s), if applicable, and any changes in the duration of schedule margins for the reporting period (changes to duration include baseline or forecast). • The following information should be considered as part of periodic project reports by the FPD: (Note: The FPD should coordinate with their program office organization about their specific guidelines and requirements which may vary depending upon the project size and complexity.) <ul style="list-style-type: none"> - MR and schedule reserve available at the beginning of the month. - An updated MR utilization curve. - An update of schedule reserve utilization, if applicable. - List of realized risks (threats and opportunities) that required usage of MR and schedule reserves (amount changed, Risk Identification (ID), and Title/Description of risk). - Adequacy of remaining contractor MR and schedule reserves.
21	How is Schedule Reserve (Margin) Reported for Non-Capital Asset Projects?	<ul style="list-style-type: none"> • Standing Operating Policies and Procedures (SOPP)-92 	<ul style="list-style-type: none"> • E Risk Reporting 	<ul style="list-style-type: none"> • i. Establish and follow a formal risk reporting process that complies with requirements, including reporting of the use of contingency and management reserves: <ul style="list-style-type: none"> ○ ii. Report on the effectiveness of established risk handling strategies ○ iii. Report on the status of existing risks ○ iv. Establish a watch list of high priority or high impact risks and report their status to management ○ v. Collect and record feedback on the risk assessment process including lessons learned

Attachment D – Survey Results



EFCOG Risk Management Task Group – Initiative 2.4



Demolition at Hanford Site

Management of Schedule Reserve (Margin) within the Integrated Master Schedule

Presented by JR Thomas

May 02, 2018



Agenda



- Survey Development
 - Schedule Reserve (Margin) matrix
 - Survey/companion document development
- Summary of results
- Recommendations
- Survey results

Survey Development

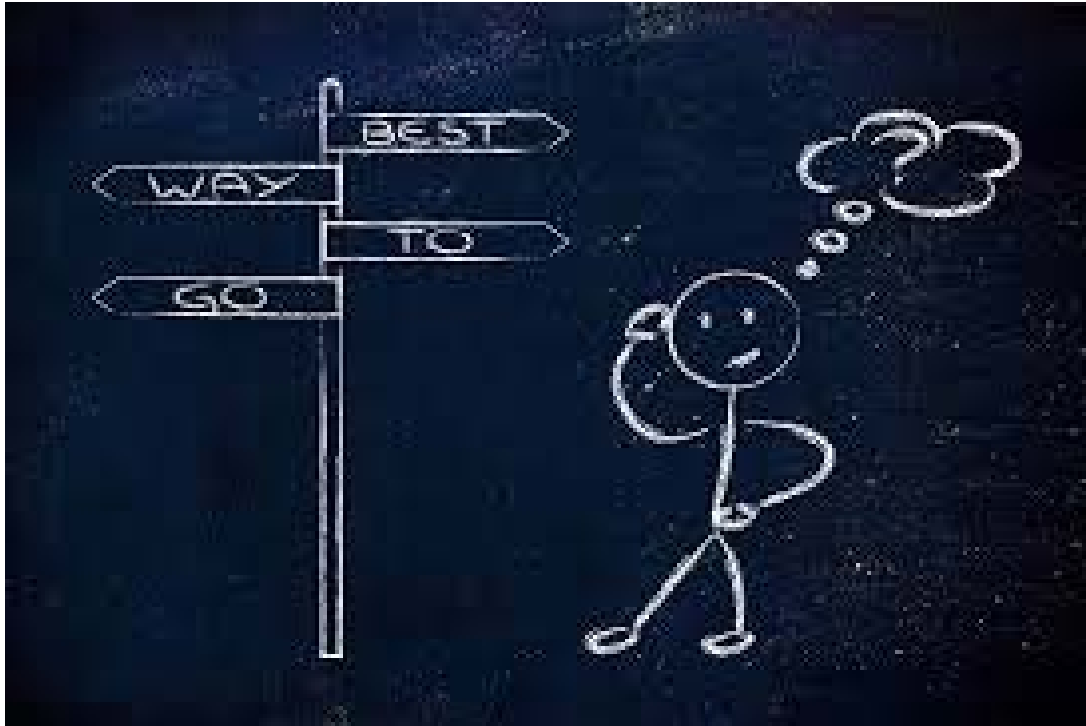


- Schedule Margin Matrix
- Survey
 - Terminology
 - Implementation
 - Monitoring
 - Documentation/Reporting
- Companion document

Summary of Results



“Consistently inconsistent”



Summary of Findings



- Multiple Risk Management references led to inconsistent application
- Implementation of Schedule Reserve (Margin) when SRA results extend past the contractor's Period of Performance (POP)
- Forecasting remaining Schedule Reserve (Margin) when challenged with extending past POP, or enforceable/incentivized milestones

Summary of Observations



- Terminology across DOE complex
- Establishing policy for Schedule Reserve (Margin) within the EVMSD
- Reporting requirements are not documented in DOE G 413.3-7A, Risk Management Guide
- Implementation of DOE Schedule Contingency into IMS
- Implementation of Schedule Reserve (Margin) for Non-Capital Projects

Recommendations

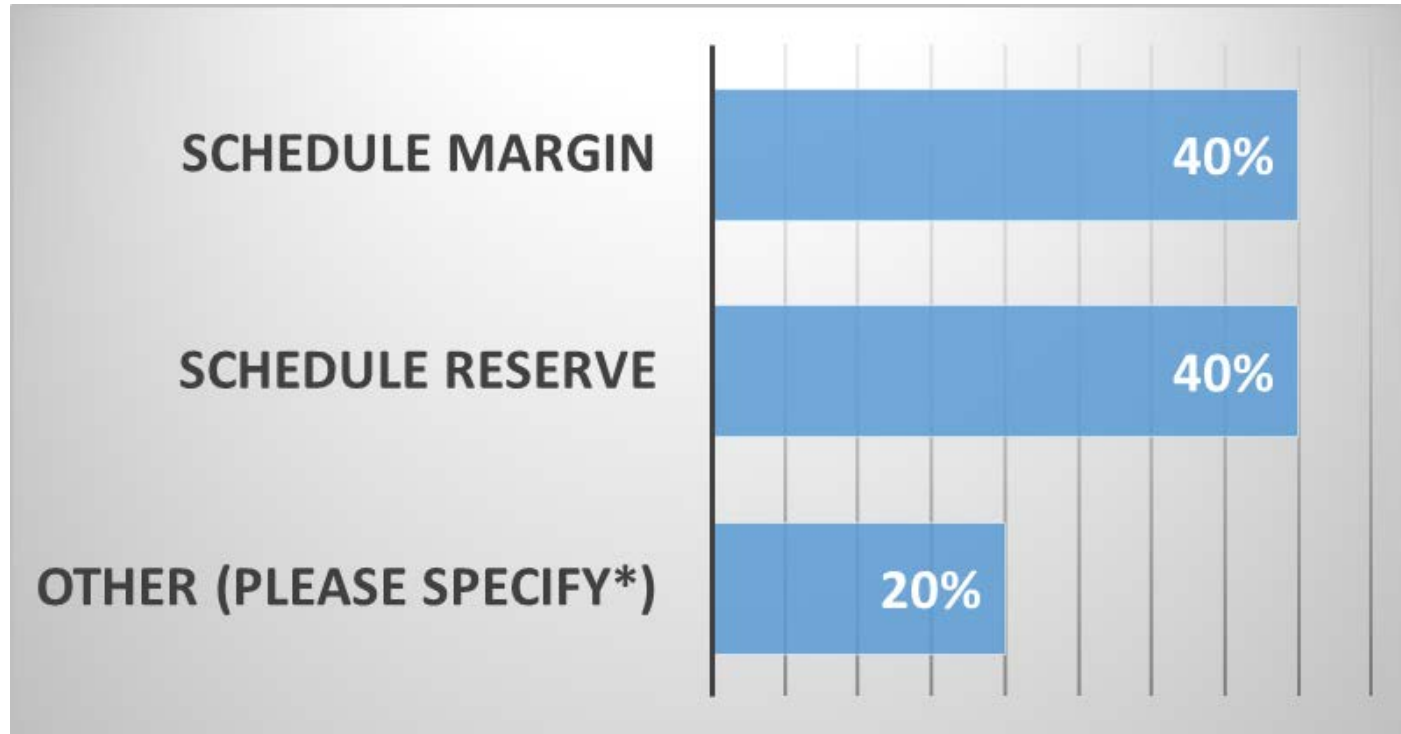


- Publish best practice initiative for management of schedule reserve (margin) within the IMS
 - Obtain consensus for path forward related to findings and observations (following slides)
- Initiate FY19 initiative to implement a comprehensive risk management best practices by functional areas for both CAP and Non-CAP
 - Estimating (change proposals, GAO twelve step process)
 - FAR part 15 (31.205-7 Contingencies)
 - Project Controls Implementation (WBS, coding, forecasting)
 - Reporting
- Identify DOE sponsor to champion a Risk Management Implementation Guide to supplement DOE G 413.3-7A

Survey Results



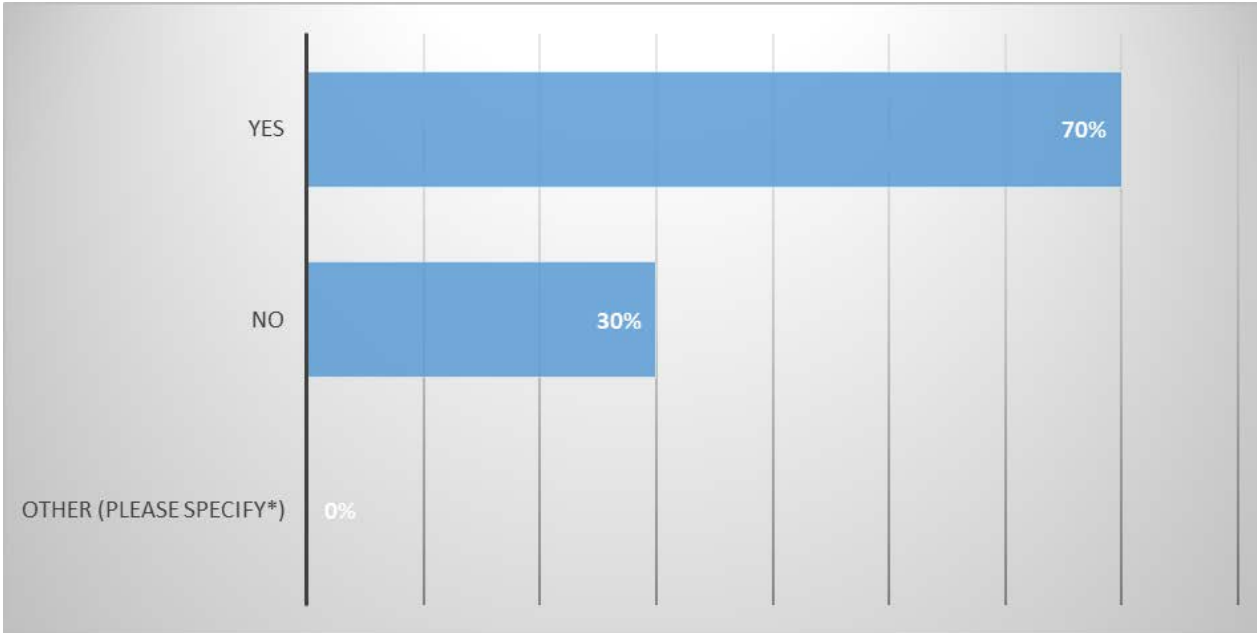
What term is used for Schedule Reserve (Margin)?



- * Schedule contingency (contractor & federal)
- * Terms are used interchangeably



Does the Earned Value Management System Description (EVM SD) establish the policy for the development and maintenance of Schedule Reserve (Margin)?

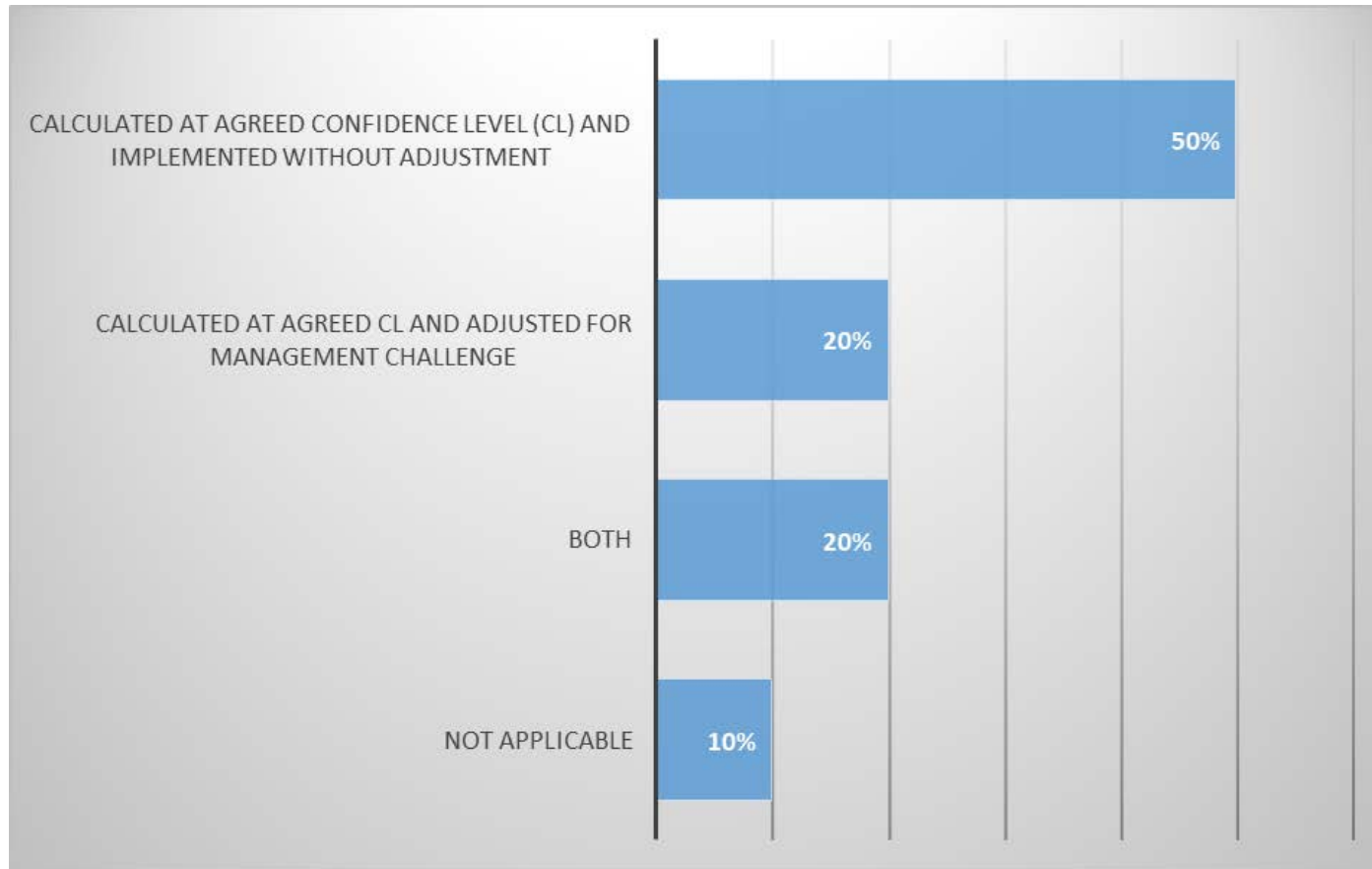


* Planning and Scheduling Guidance, subordinate document to the EVM SD



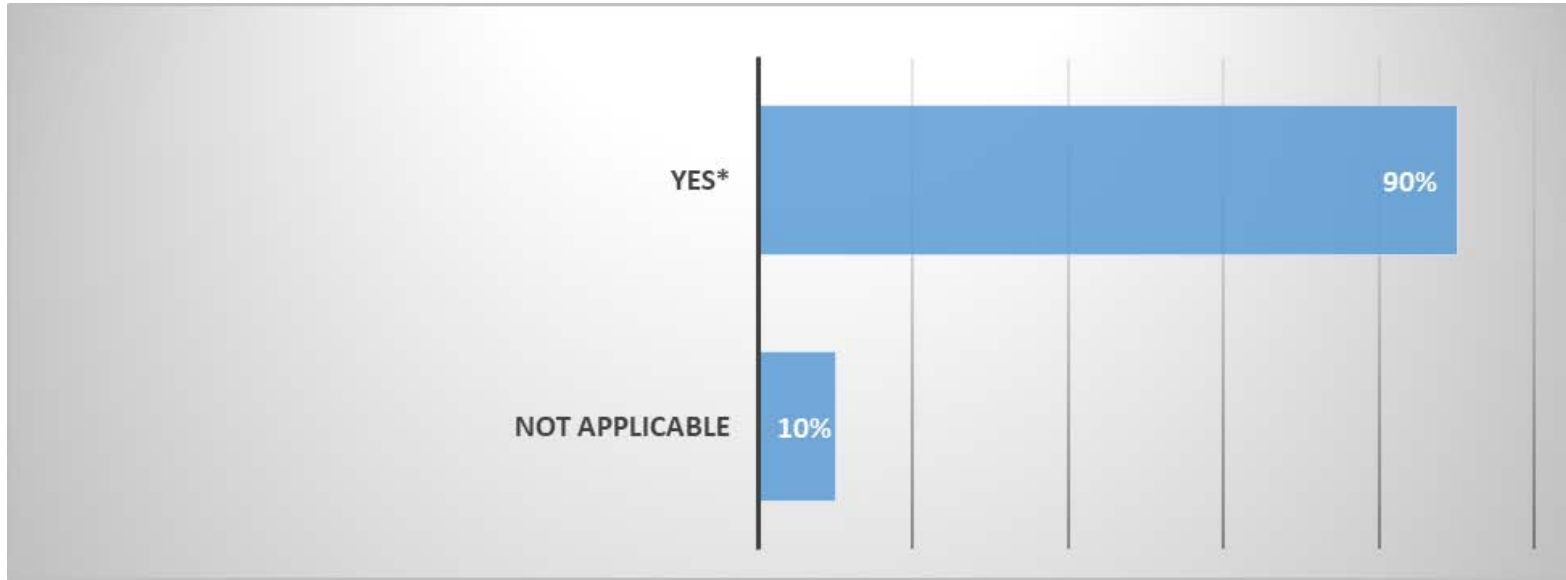
Survey Question #2

How is Schedule Reserve (Margin) determined for Capital Asset Projects?



Survey Question #3

Is Schedule Reserve (Margin) Implemented in the baseline AND forecasted IMS for Capital Asset Projects?



* Schedule Reserve vs. Schedule Margin



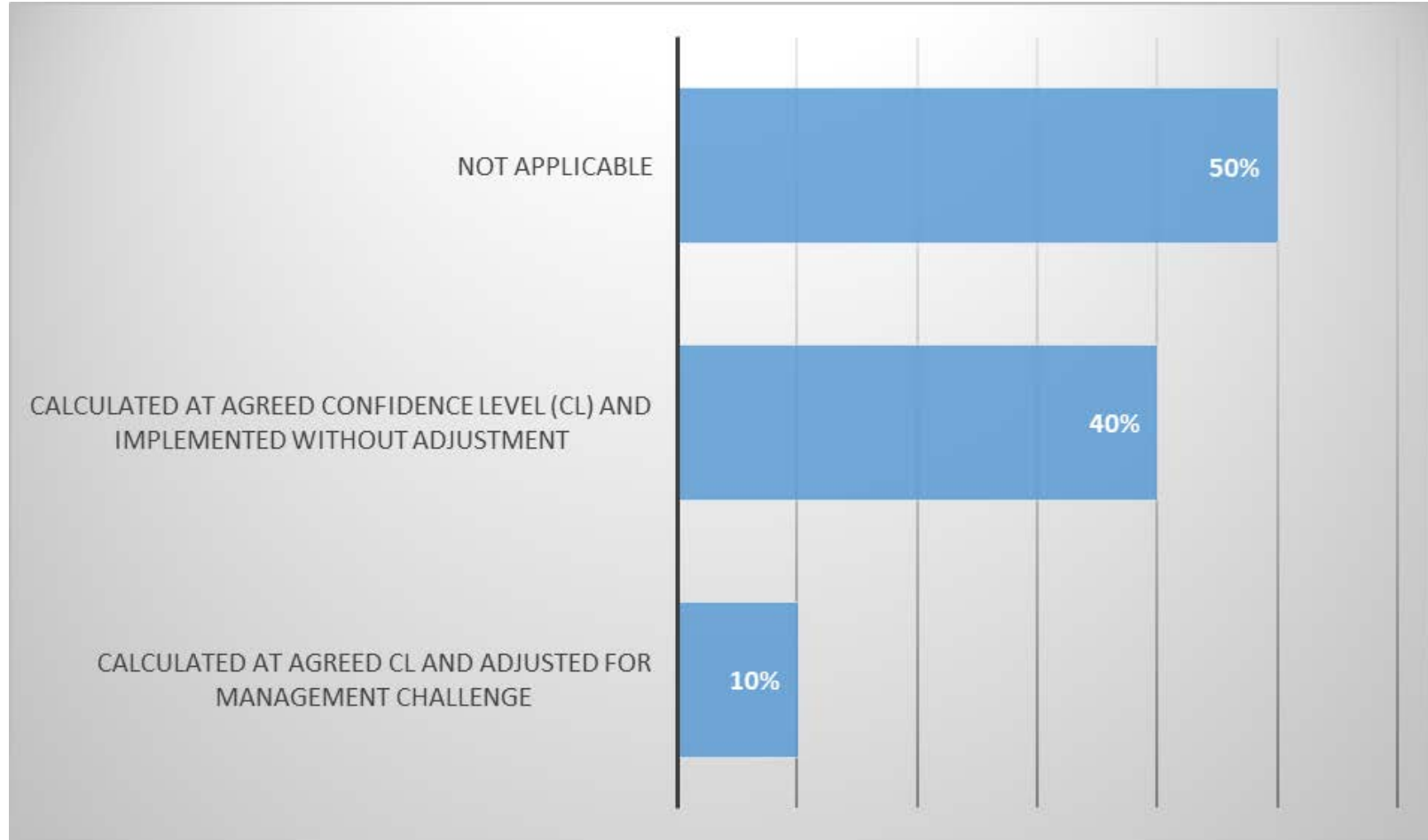
Is Schedule Contingency implemented in the baseline AND forecasted IMS for Capital Asset Projects?



* DOE Client has elected to not implement Schedule Contingency into the contractor's IMS.

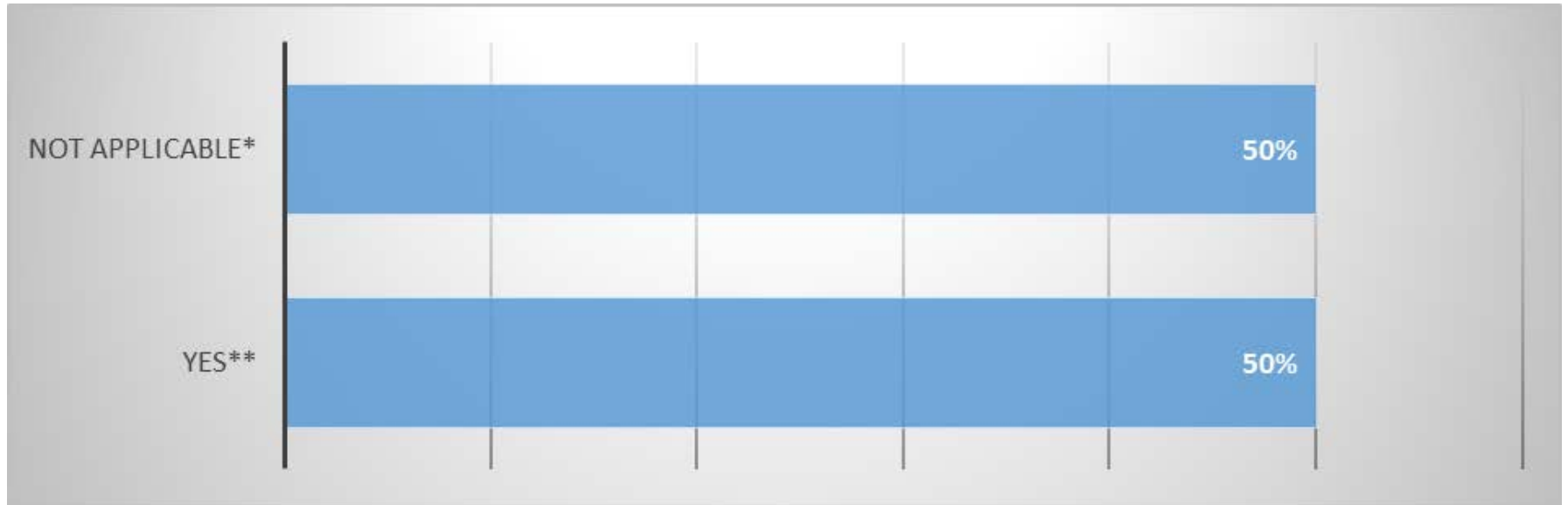


How is Schedule Reserve (Margin) determined for Non-Capital Asset Projects?



Survey Question #6

Is Schedule Reserve (Margin) Implemented in the baseline AND forecasted IMS for Non-Capital Asset Projects?

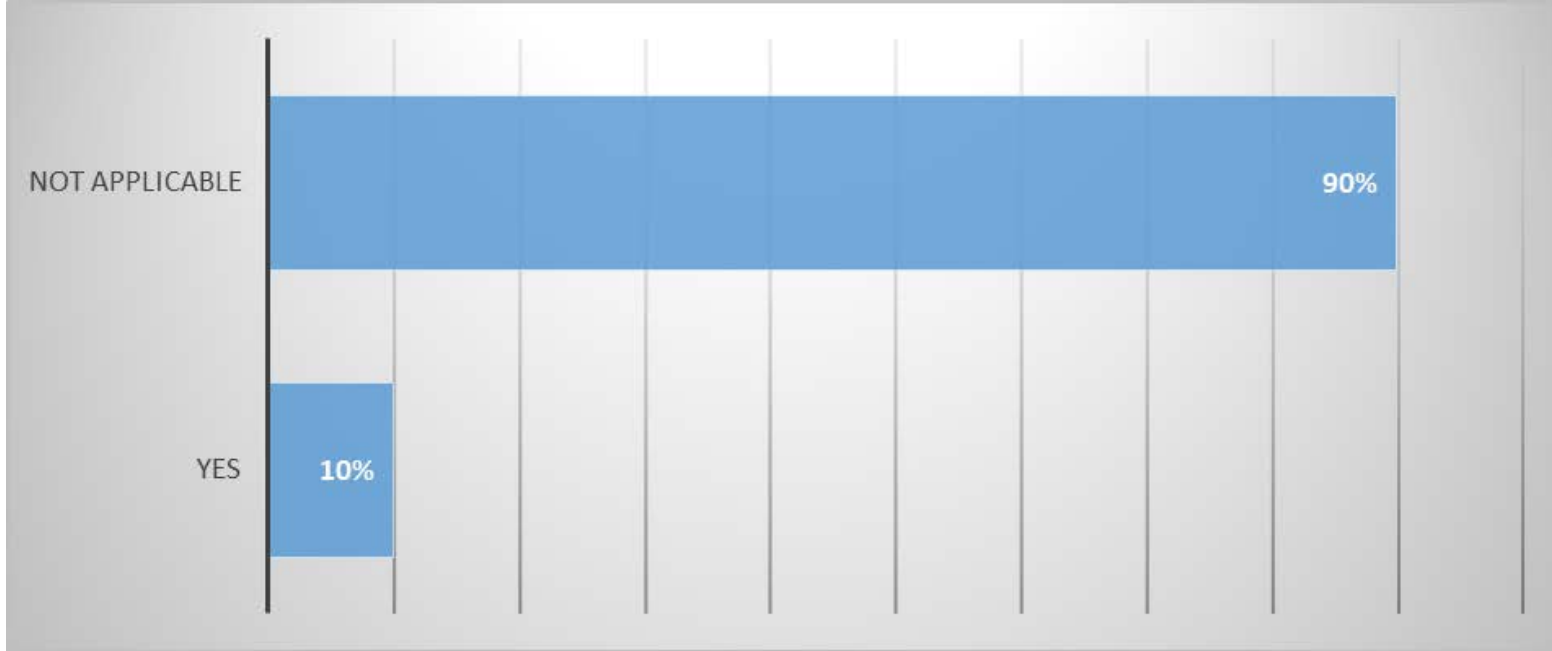


* Schedule Reserve vs. Schedule Margin



Survey Question #7

Is Schedule Contingency implemented in the baseline AND forecasted IMS for Non-Capital Asset Projects?

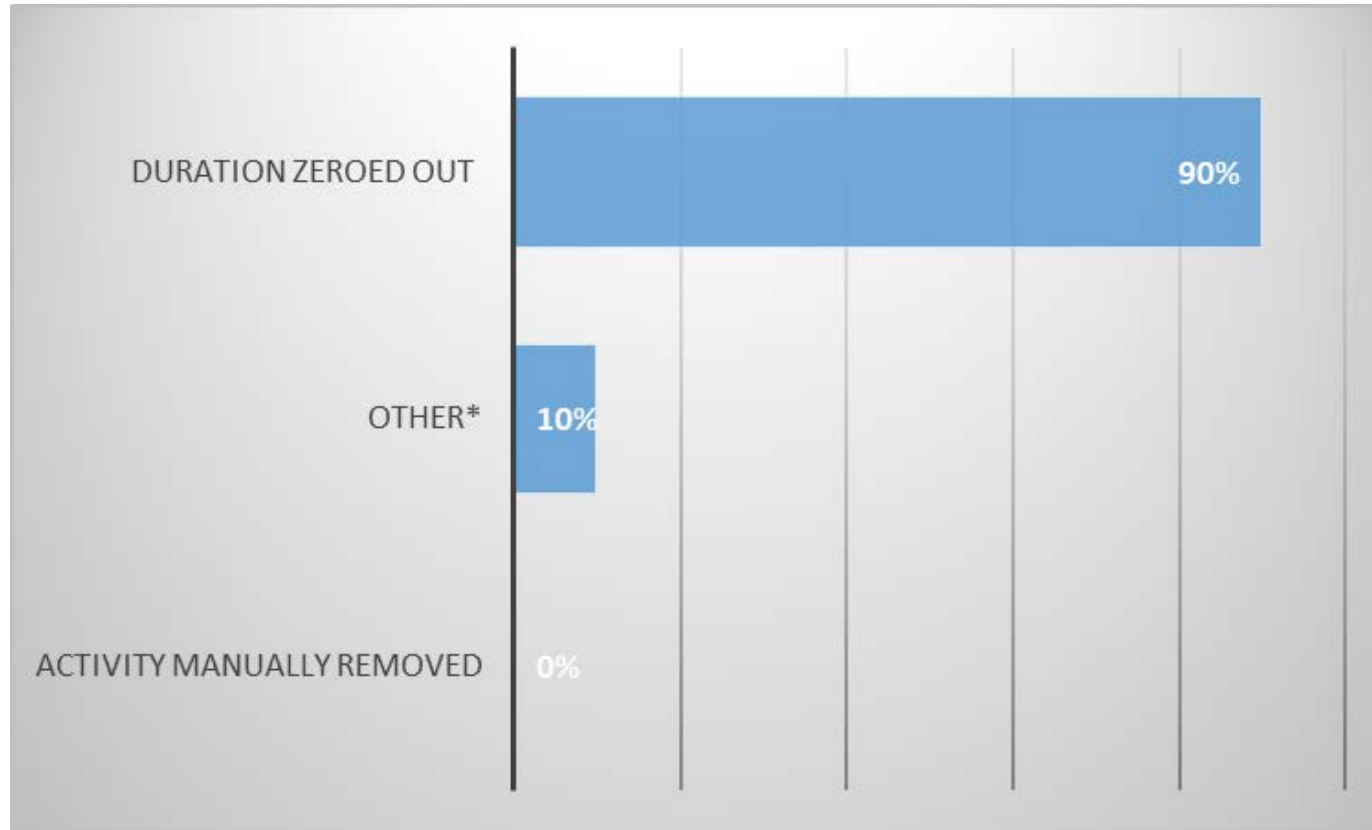


Survey Question #8

Does Schedule Reserve (Margin) have budget associated with it?



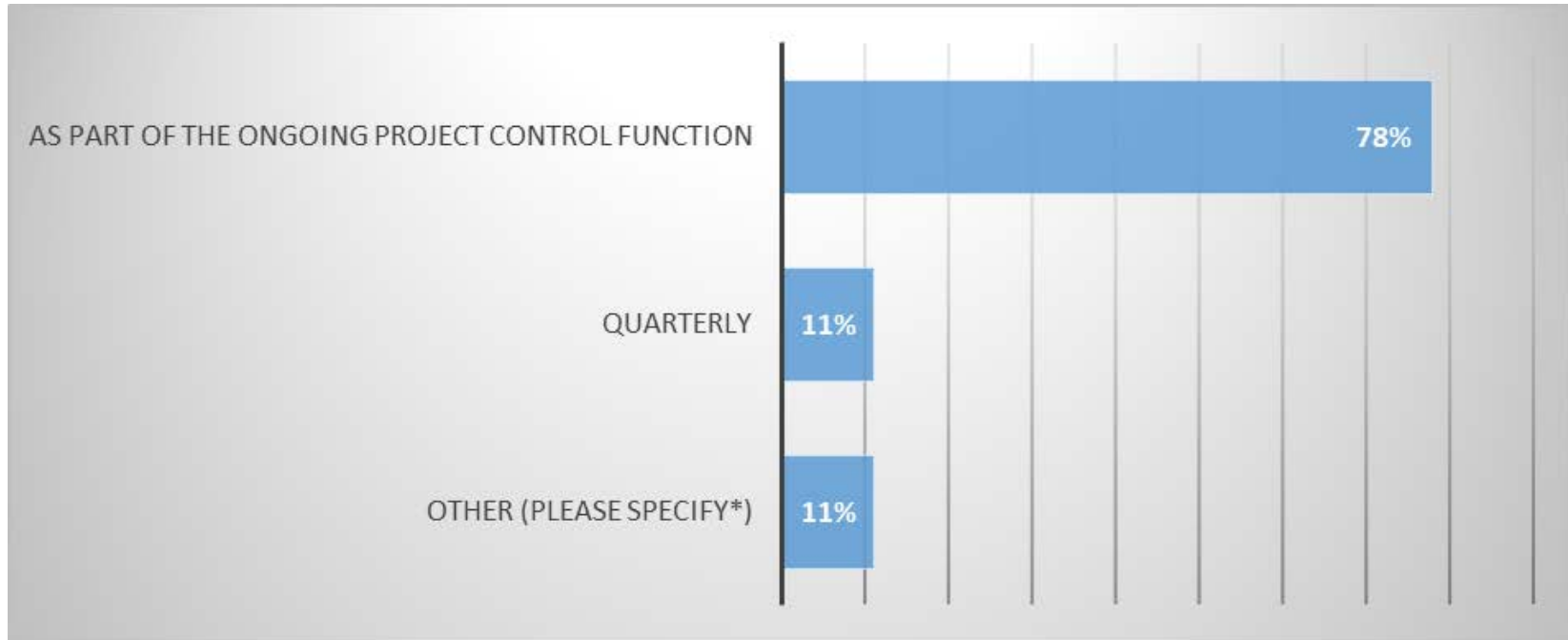
How is established Schedule Reserve (Margin) handled when running a risk analysis?



* SM task is changed to a 1-day duration as P6 can not have a task with zero duration.



How often is Schedule Reserve (Margin) evaluated?

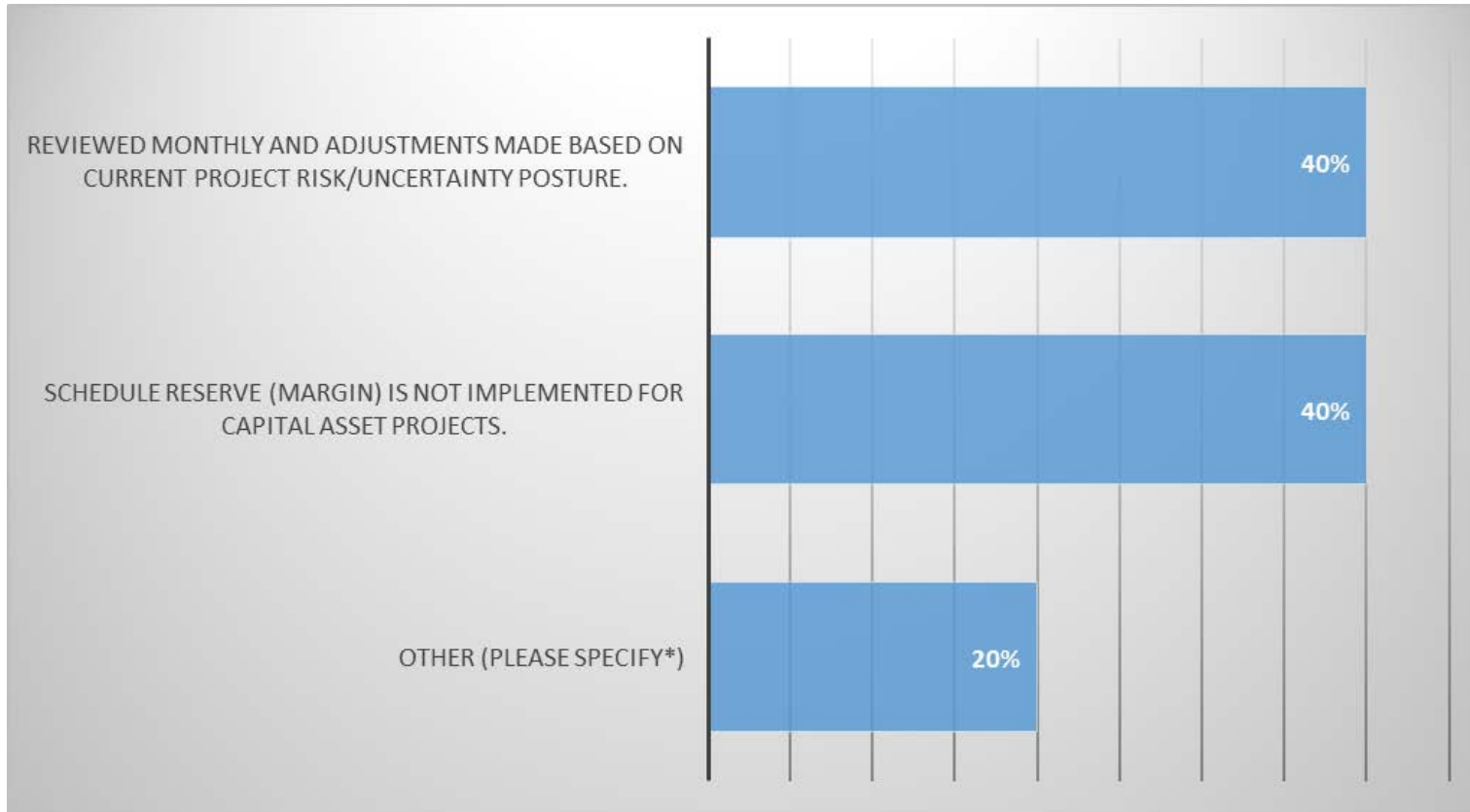


* Monthly for Capital Projects. Other frequency for non-Capital.



Survey Question #11

How is Schedule Reserve (Margin) utilized within the Forecasted Capital Asset Project IMS?

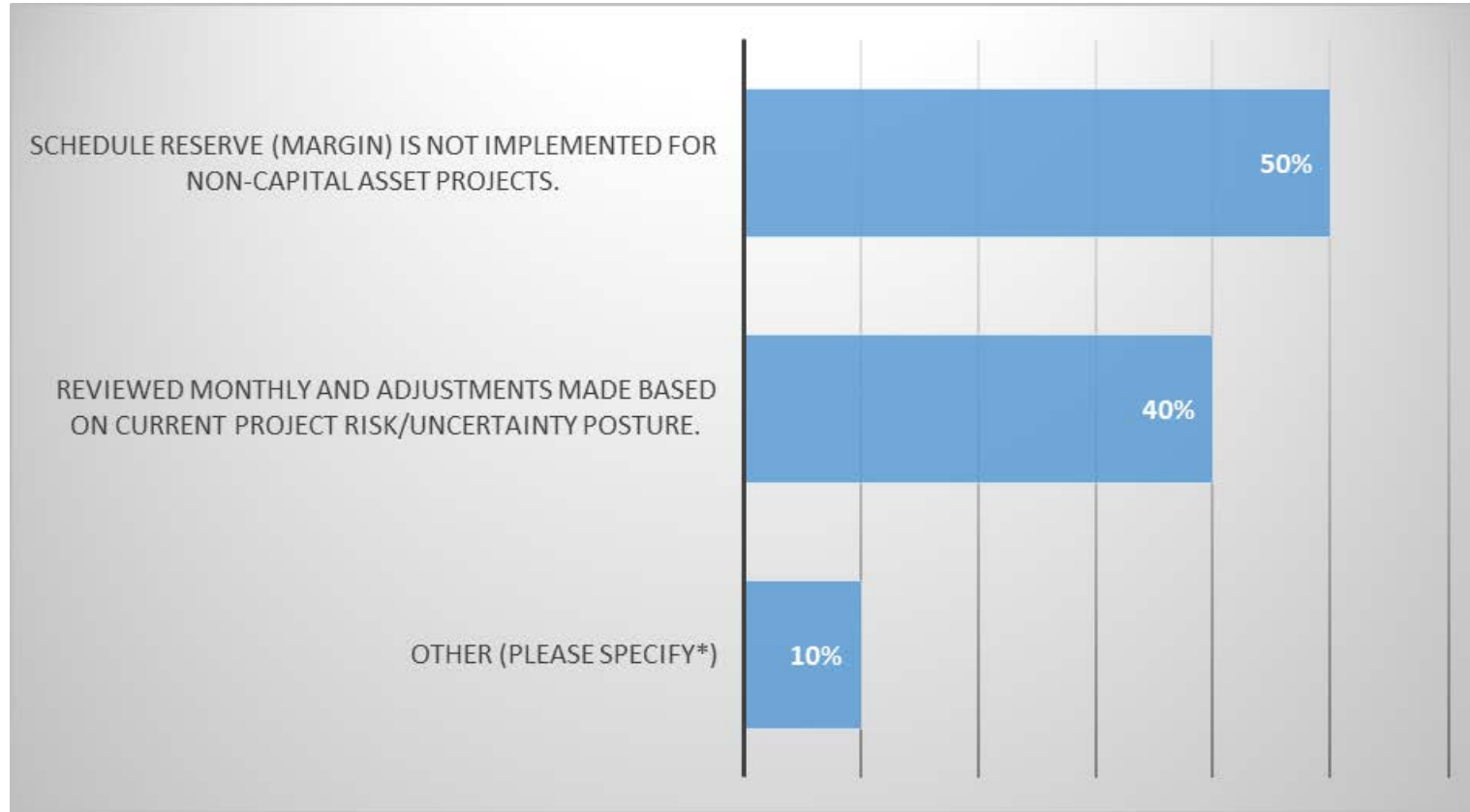


* No basis for schedule reserve reductions except to absorb the effect of schedule delays.

* SRA is run on a monthly basis, SM is adjusted in the forecast per the current SRA run.



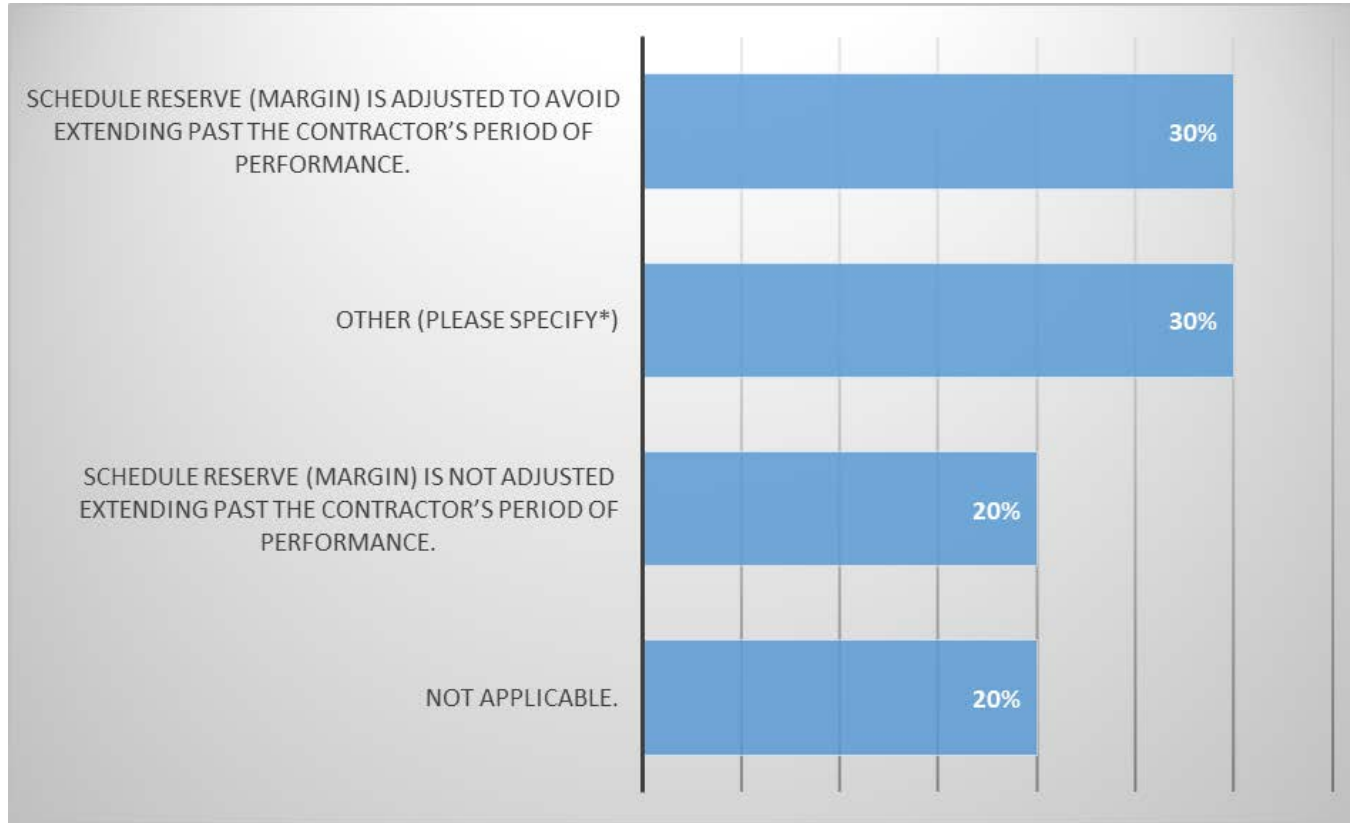
How is Schedule Reserve (Margin) utilized within the Forecasted IMS for Non-Capital Asset Projects?



* As required per contractor specific guidelines



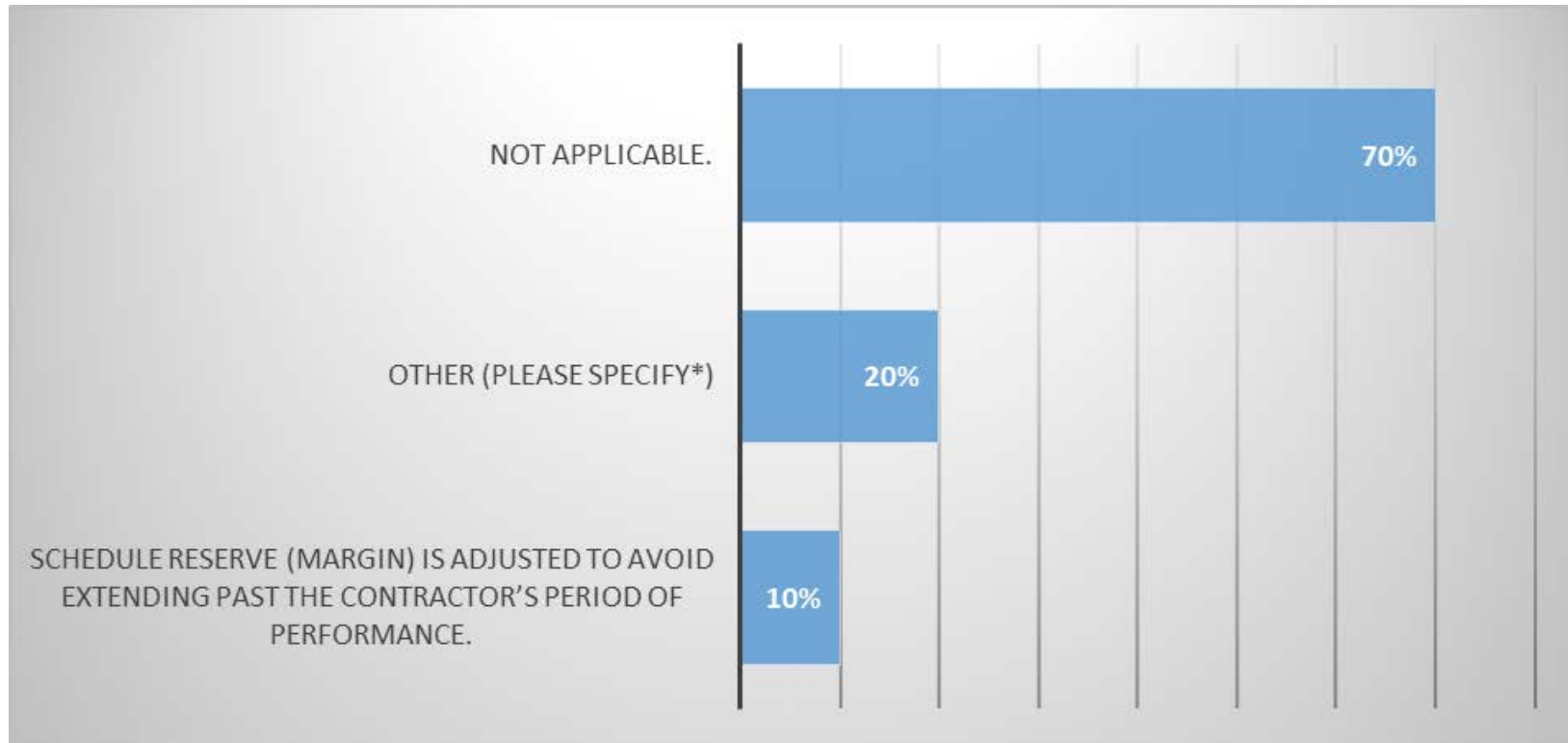
How is Schedule Reserve (Margin) managed for Capital Asset Projects when the quantitatively derived portion of the overall contract schedule extends past the contractor's period of performance when establishing the baseline?



* Negotiate with DOE to extend POP, establish a OTB, or re-plan to crash schedule with documented assumptions.



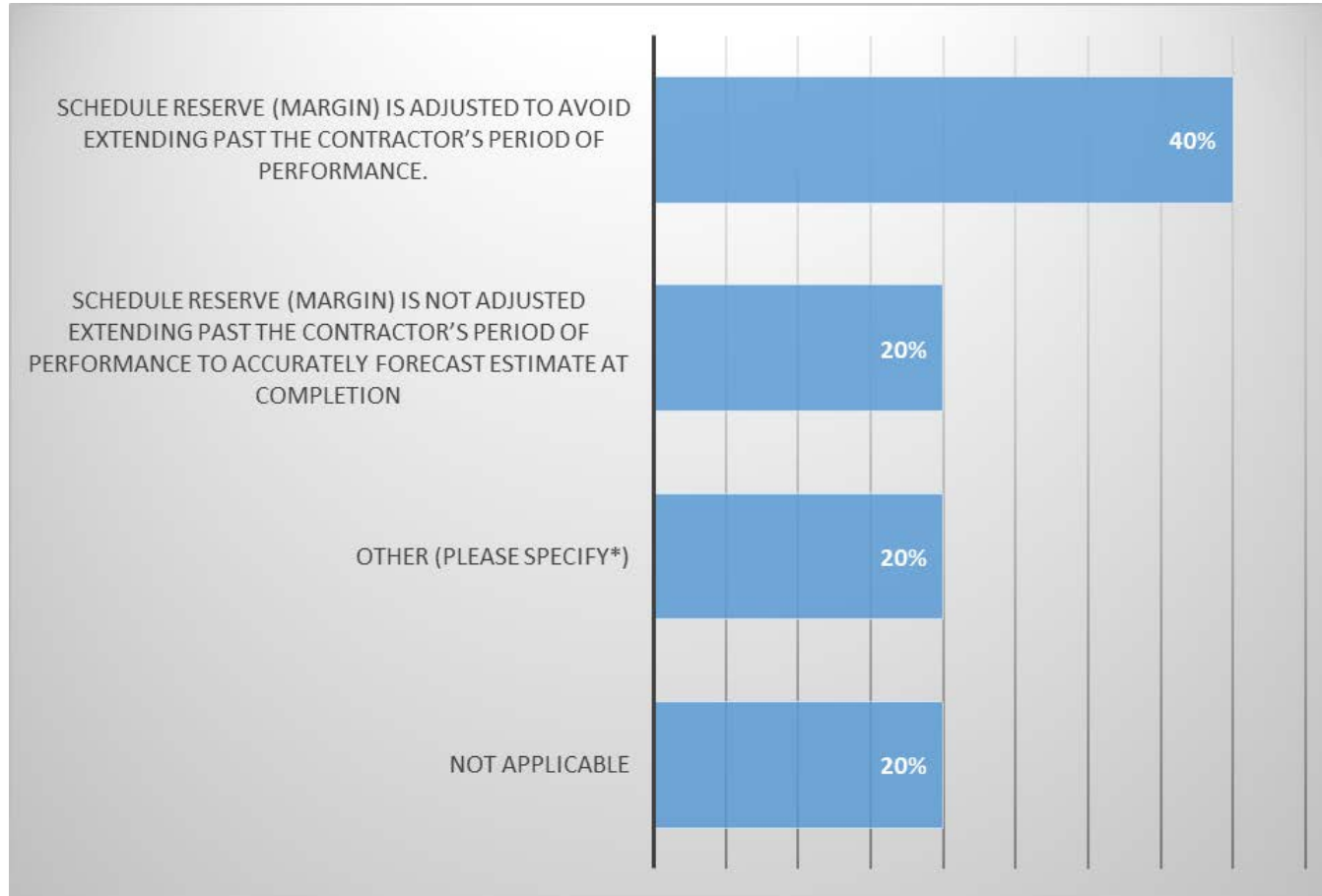
How is Schedule Reserve (Margin) managed for Non-Capital Asset Projects when the quantitatively derived portion of the overall contract schedule extends past the contractor's period of performance when establishing the baseline?



* Negotiate with DOE to extend POP, establish a OTB, or re-plan to crash schedule with documented assumptions.



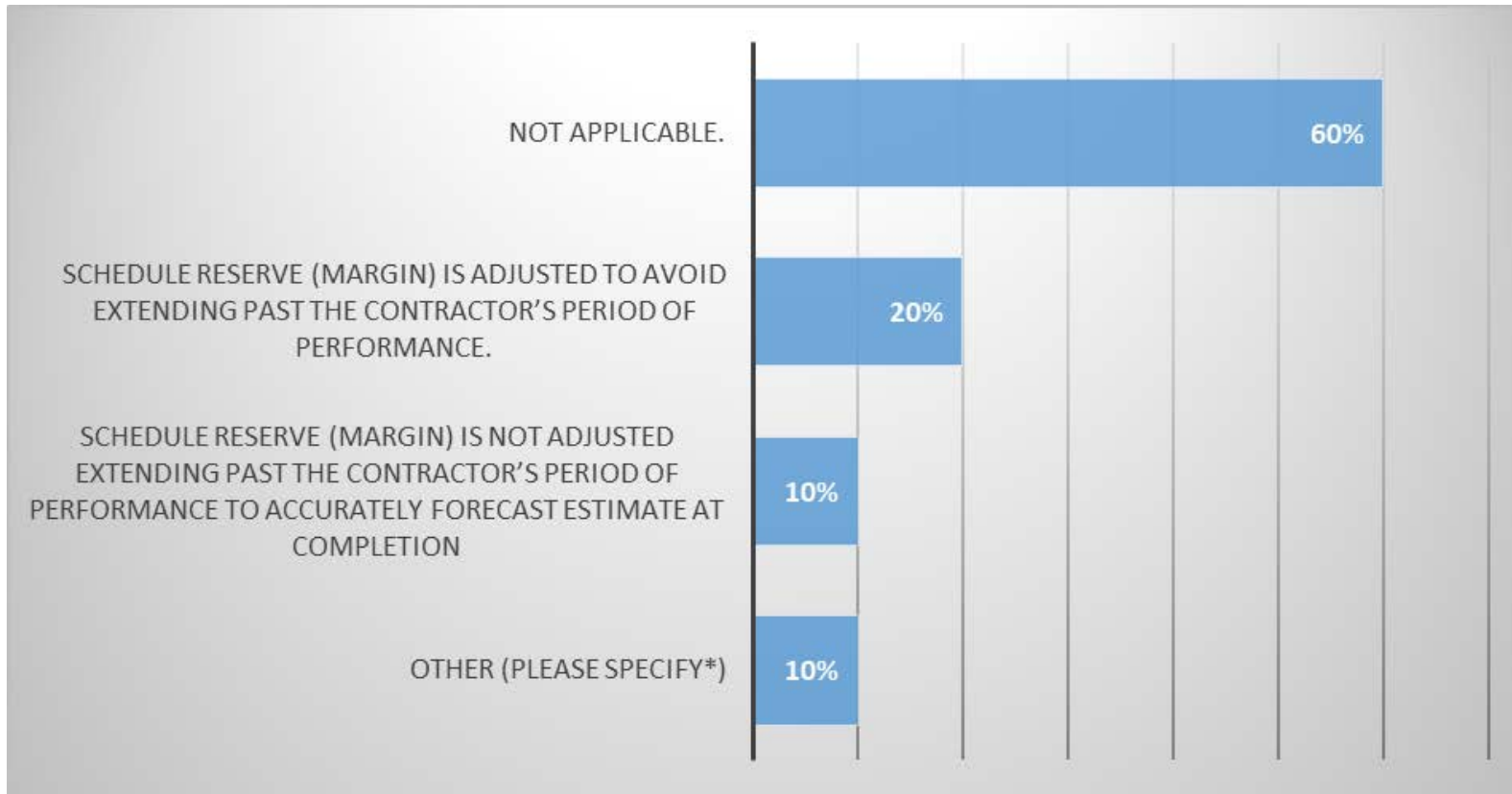
How is Schedule Reserve (Margin) managed for Capital Asset Projects when forecasted beyond the contractor's period of performance or enforceable/incentivized milestones?



* Negotiate with DOE to extend POP, establish a OTB, or re-plan to crash schedule with documented assumptions.



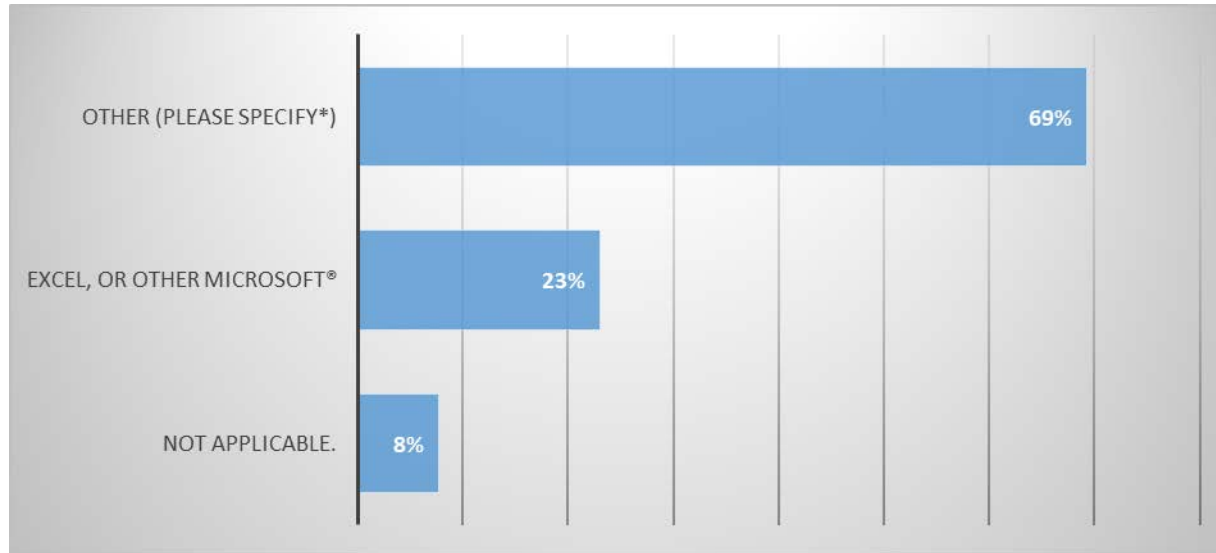
How is Schedule Reserve (Margin) managed for Non-Capital Asset Projects when forecasted beyond the contractor's period of performance or enforceable/incentivized milestones?



* Negotiate with DOE to extend POP, establish a OTB, or re-plan to crash schedule with documented assumptions.



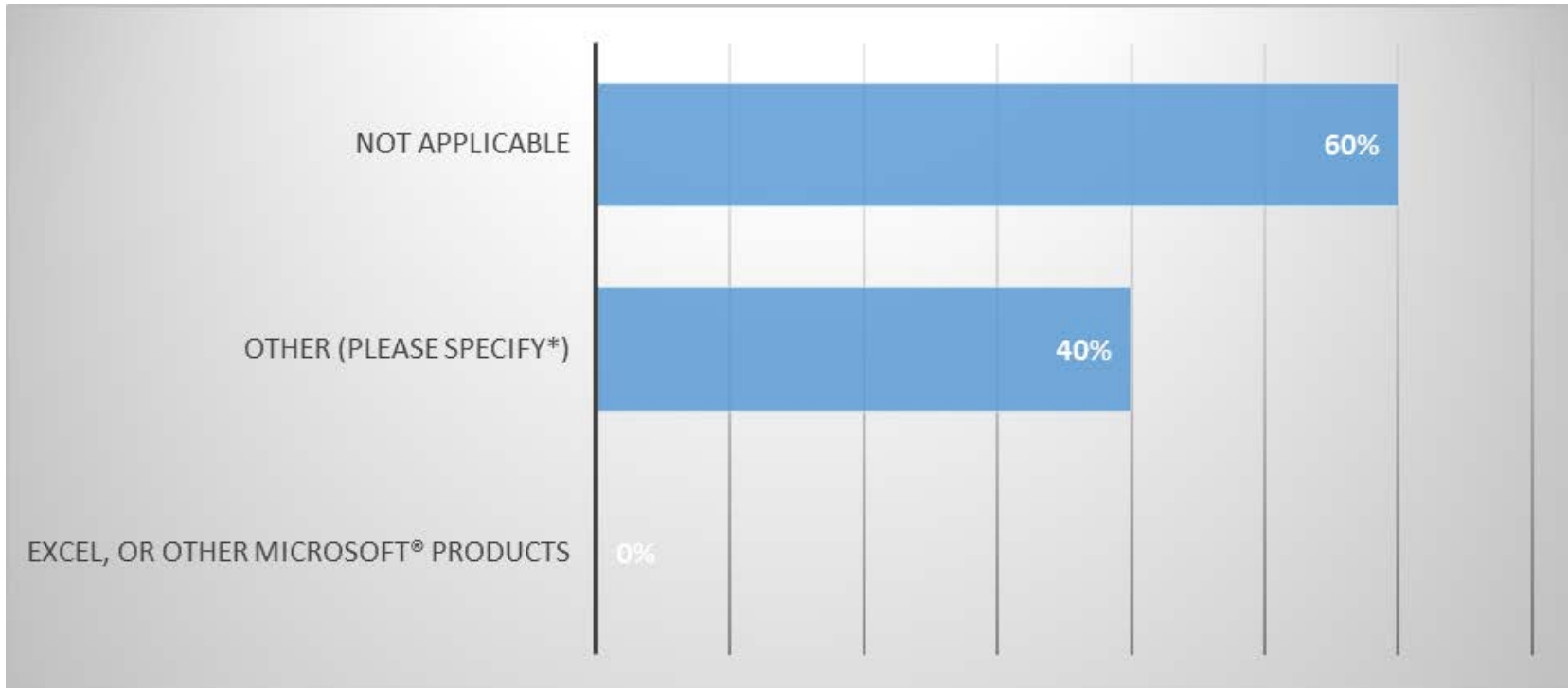
What tool is used to represent time-phased, AND utilization of Schedule Reserve (Margin) for Capital Asset Projects?



- * CONTRACT PERFORMANCE REPORT (CPR), Format 5. In addition, P6 represents the time-phased reserves needed over the project duration.
- * Primavera Risk Manager
- * Acumen Fuse



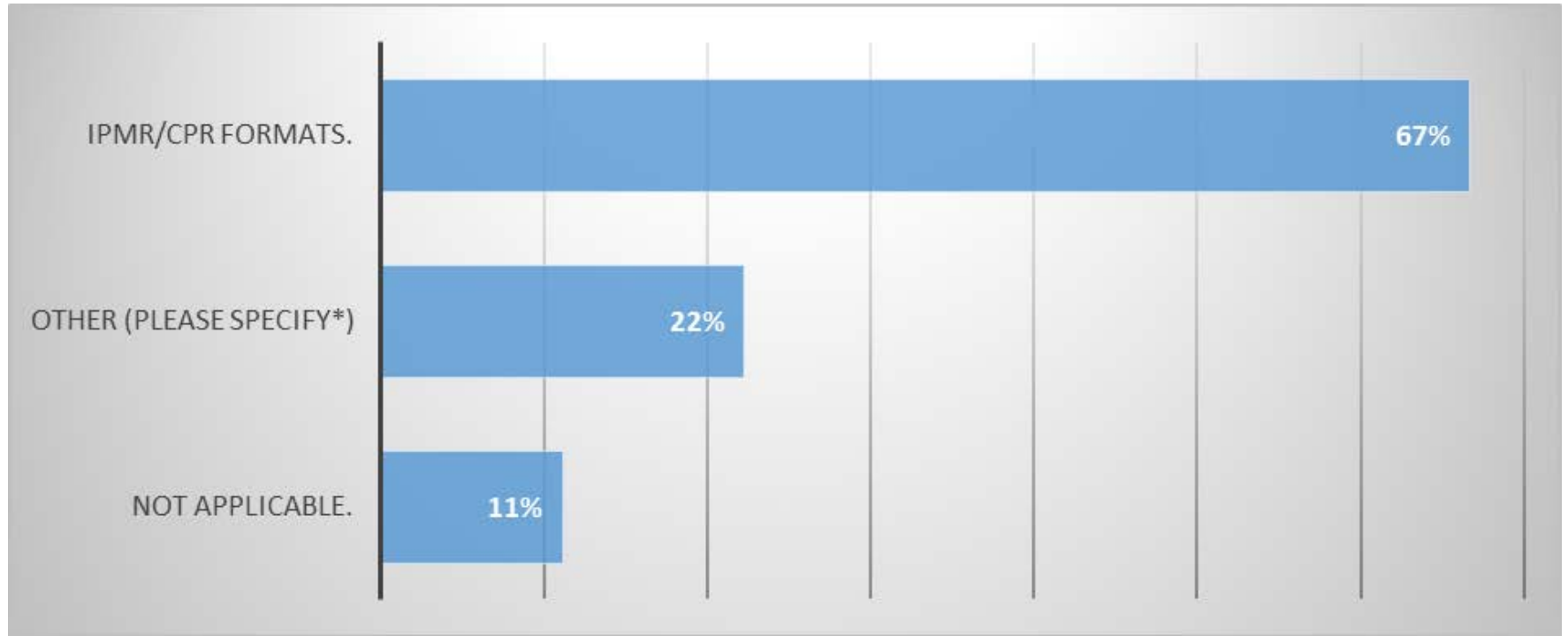
What tool is used to represent time-phased, AND utilization of Schedule Reserve (Margin) for Non-Capital Asset Projects?



* SM Is not currently utilized on non-capital projects, however if it were it would be performed in the same manner as capital.



How is Schedule Reserve (Margin) Reported for Capital Asset Projects?



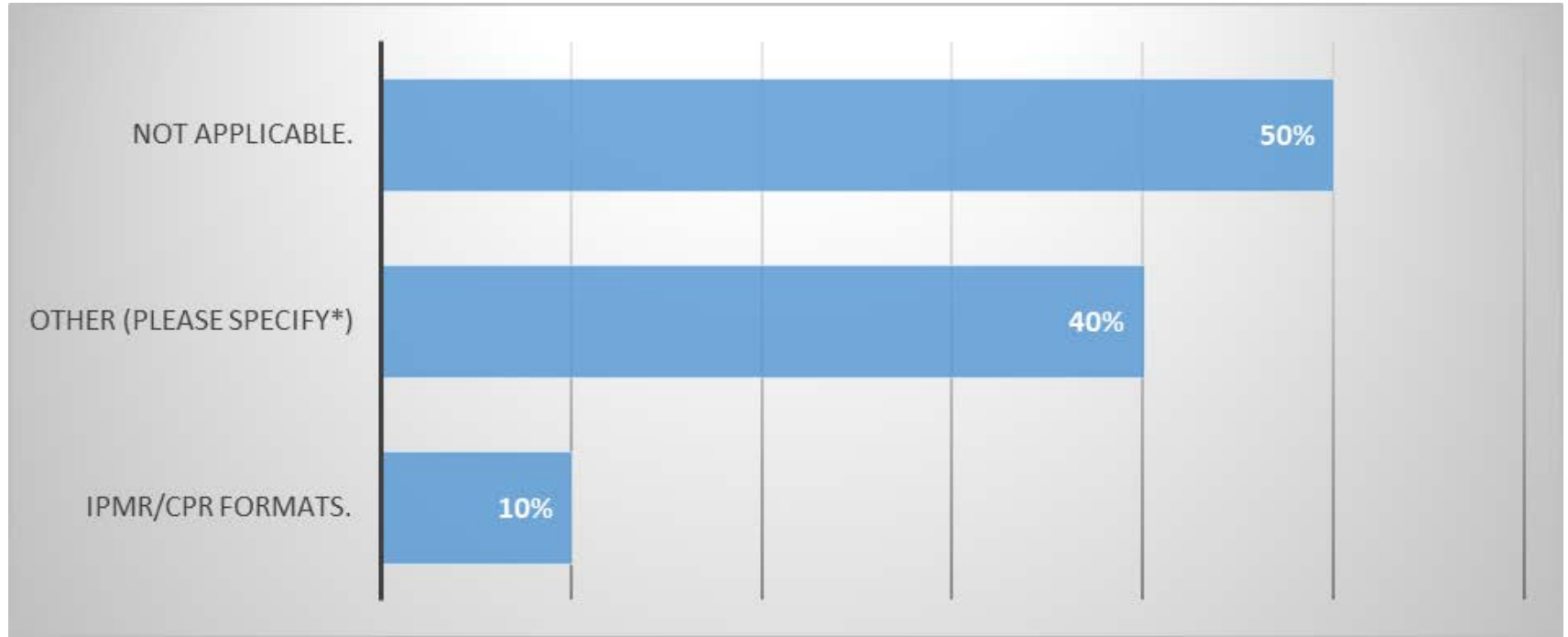
*Within the P6 schedule tool

* In the submitted IMS baseline and forecast schedules.



Survey Question #20

How is Schedule Reserve (Margin) Reported for Non-Capital Asset Projects?



* In the submitted IMS baseline and forecast schedules.



Survey Question #21



Thank you for your time



Questions?

