



The Department of Energy's Project Reporting and Assessment System (PARS)

PARS Empower Schedule Health Assessment, Module 3 PARS User Advanced Training

1

Welcome to the third of eight sessions which comprise the Department of Energy's Project Reporting and Assessment System advanced user training. The analysis and reporting capabilities of PARS provide decisions makers at all levels to best manage these projects over their lifecycle. In this course we will look at the Assessing Schedule Health in the Earned Value Management System and Project Analyst Standard Operating Procedure (EPASOP). Unlike the basic user course where the EPASOP and PARS were introduced, the focus here will be on looking at data in PARS and using this data for analysis.

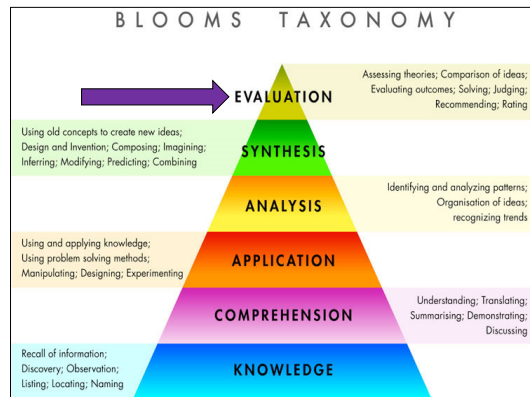


Training Objectives

- **Assess which Empower and PARS tools and capabilities to use in analyzing projects.**
- **Apply DOE EVMS and Project Analysis Standard Operation Procedure to projects**
- **Evaluate Projects using appropriate dashboards, views, charts, and reports information**
- Assess data provided to DOE through the use of EVMS metric tests and data quality reports
- **Building advanced pre-filters in Empower**

AT COMPLETION - EARN 8 CEU/PDUS

- Federal Employees – Will be added to CHRIS
- Contractor Employees – ???



This third session will continue to focus on the first three training objectives. The course looks at using the tools for data analysis, and project evaluation.

This course has a pre-requisite of the PARS User Basic Course along with the EVMS 24X7 course, the EVMS 24X7 course can be waived if a user has comparable knowledge ([PLACE link to a synopsis of each course here](#)).

I would like to thank the Federal Project Directors providing material for the is course, Pam Marks from Salt Waste Processing Facility, Janelle Armijo from Safety Significant Confinement Ventilation System, and Janet Diediker from Tank-Side Cesium Removal System Demonstration Subproject. You will see material from their projects throughout the course.



Assessing Schedule Health

- DOE Analysis Plan Step Two in the EPA SOP
- Schedule is a basic component of an integrated time-oriented plan to accomplish work scope requirements. If poorly done, it can generate problems which manifest as cost data concerns
- Concerns in this area not only apply to project performance but may also to systemic concerns with the contractor's EVMS
- Flags do not mean the data is invalid, but rather that further investigation is needed to be sure the cause and impact is understood

The project schedule and budget are an integrated time-oriented plan for accomplishment of work scope requirements on a project. Schedule planning and control, budget planning and control, work scope definition, and project risk handling are necessary prerequisites for basic and effective project management control. The second step of the analysis plan is to assess the health of the schedule. This step is also done in preparation for EVMS review, review of a major schedule restructure, and whenever schedule health is a concern.

Concerns in this area not only apply to Project performance but may also to systemic concerns with the contractor's EVMS. The following metrics provide the analyst with a framework for asking educated questions and performing follow-up research. The identification of a triggered metric is not in and of itself synonymous with failure but rather an indicator or a catalyst to dig deeper in the analysis for understanding the reason for the situation. Consequently, correction of that metric is not necessarily required but it should be understood.



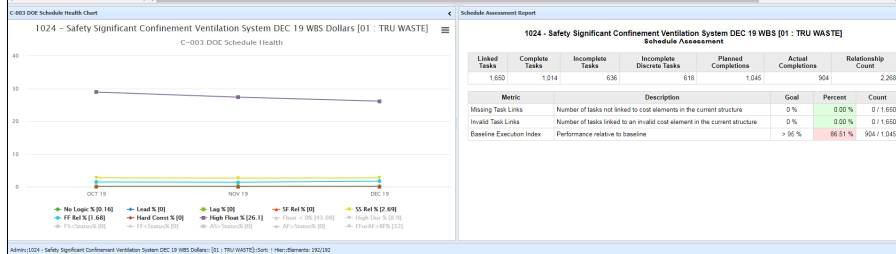
Assess Schedule Health

Four parts to the Assess Schedule Health Dashboard:

- DOE Schedule Health View
- DOE Schedule Health Chart
- Empower Schedule Assessment Report
- DOE Gantt Charts

| HIER | UID | WbsNum | Name | LinkVal | 2016 | | | | 2017 | | | | |
|--------|-----------|-------------------|-------------------------------|-------------------|------|---------|-------|------|---------|---------|-------|------|---------|
| | | | | | per | January | April | July | October | January | April | July | October |
| 111111 | NFBBL0100 | 01.08.01.01.01.01 | Provide M&O Support for Initi | 01.08.01.01.01.01 | | | | | | | | | |
| 111111 | NFBBL0140 | 01.08.01.01.01.01 | Prepare NFB NEPA Report FY | 01.08.01.01.01.01 | | | | | | | | | |
| 111111 | NFBBL0150 | 01.08.01.01.01.01 | Prepare NFB NEPA Report FY | 01.08.01.01.01.01 | | | | | | | | | |

| HIER | WBS | DESCRIPTION | LL | UL | % Complete | % Spent | Complete | Tasks | Incomplete Tasks | SL Item | Task | CM | Element Type | EV | WBS | No Logic | Lag | Start Finish Relationship | Start Start Relationship | Finish Finish Relationship | Hard Constraint | High Float | Post < 0 | Hgn Duration | Forecast Start < Start Date | |
|--------|-------------------|---------------------------|----|--------|------------|---------|----------|-------|------------------|---------|------|----|--------------|---------|-----|----------|-----|---------------------------|--------------------------|----------------------------|-----------------|------------|----------|--------------|-----------------------------|--|
| 1 | 01 | TRU WASTE | 3 | 38.21 | 41.01 | 0 | 1050 | 636 | 436 | | | | WBS | 41 | 45 | | | | | | | | | | | |
| 11 | 01.08 | New Underground ventila | 3 | 39.72 | 42.63 | 0 | 1621 | 622 | 622 | | | | WBS | 41 | 45 | | | | | | | | | | | |
| 111 | 01.08.01 | Safety Signficant Confin | 3 | 39.72 | 42.63 | 0 | 1602 | 622 | 622 | | | | WBS | 41 | 45 | | | | | | | | | | | |
| 1111 | 01.08.01.01 | New Filter Building (NFB) | 4 | 35.24 | 36.90 | 0 | 1018 | 382 | 382 | | | | WBS | 41 | 45 | | | | | | | | | | | |
| 11111 | 01.08.01.01.01 | NFB OTHER PROJECT CD | 5 | 100.00 | 100.00 | 1 | 39 | 0 | 0 | | | | CA | 41 | 45 | | | | | | | | | | | |
| 111111 | 01.08.01.01.01.01 | NFB Support OPC P108 | x | 6 | 300.00 | 100.00 | 1 | 11 | 0 | | | | WP | Percent | 41 | 45 | | | | | | | | | | |
| 111111 | 01.08.01.01.01.01 | NFB Support OPC P108 | x | 6 | 100.00 | 100.00 | 1 | 3 | 0 | | | | WP | LDE | 41 | 45 | | | | | | | | | | |



The Schedule Health Dashboard is made up of three items, the DOE Schedule Health View, DOE Schedule Health Chart, and The Schedule Assessment Report. This is also a good place for users with two or more monitors to open up the Gantt Chart in a separate window holding the control key when you select it. This can be a new dashboard you may want to save for future use. We will now take a look at each of the tri-pane items in more detail as well as the Gantt Chart.

Pre-filter benefit to not load all activities, but only those in pre-filter.

The Gantt is not the chart with this view, to preserve load time.



Project Analysis Plan

Producing
trustworthy
data and
knowledge
for
management

- **Current** - As agreed to or directed, such as time now, end of reporting period, or a predetermined specific period of time.
- **Accurate** - Without error, mistake, miscalculations, or anomalies.
- **Complete** - Comprehensive, all inclusive, total, or entire.
- **Repeatable** - Ability to reproduce current, accurate, complete, and auditable results.
- **Auditable** - Ability to trace the source through the entire system/process to validate the results.
- **Compliant** - Demonstrated as meeting the above characteristics and applicable policies, requirements, and procedures

5

Again - DOE, in working with the Energy Facilities Contractors Operating Group or EFCOG Project Control Workgroup have a goal for data, both used by a contractor and provided to the government, in this case PARS, to meet the following standards:

Be Current
Be Accurate
Be Complete
Be Repeatable
Be Auditable
and be Compliant

The Schedule is a primary driver into most of the systems in the EVMS and we want to make sure as PARS users that we have confidence in the schedule and as such it gets its own set of checks in the Empower tool. We will now delve further in to the Project Analysis Plan.



The Project Analysis Plan

| DASHBOARD | CHART | REPORT | VIEW |
|-------------------|---|--|---|
| Data Validity | DOE Data Validity | Validity | DOE Data Validity |
| Schedule Health | DOE Schedule Health | Schedule Assessment | DOE Schedule Health |
| Variance Analysis | DOE Variance Analysis | Six Period Summary | DOE Variance Analysis |
| Trend Analysis | 1. DOE Trend Analysis 2. Schedule Execution Indexes 3. MR-UB Trends | 1. Earned Schedule 2. BCWS Volatility | 1. DOE Trend Analysis 2. Earned Schedule |
| Forecast | DOE Forecast (EAC to IEACs) | 1. Six Period Summary 2. AI Narrative Report (EAC Analysis) | 1. DOE Forecast 2. CPI vs TCPI EAC |

6

As you remember, the project analysis plan is setup to follow five steps. The goal remains to understand the variance, trends, and forecasts to inform management and leadership decisions. The table identifies the five steps aligned with the 5 dashboards set up in Empower. The steps include reviewing the data validity, which looks at the cost data, then schedule health, variances, trends and forecasts. Similar to cost data validity, the schedule health check provides a monthly look at the schedule data quality and to identify or track areas of concern. It is easier to find anomalies and to know which items you have already researched and accepted versus areas you are looking for improvements over time. This is the second of two steps which help identify if the user puts trust in the data towards the EFCOG goal of data that is current, accurate, complete, repeatable, auditable, and compliant. We will focus on Schedule Health for the rest of this session.





Schedule Health

- Many of the metrics described in this EPASOP are designed to provide insight into the performance of a project, based on belief in the data provided.
- If a contractor's data has one or more flags on the conditions being tested for by these metrics, the analyst should investigate further.
- The schedule health dashboard has three tools, a report, chart and view. The sort view to the right of standard columns is below.

| HIER | WBS | DESC | LL | LVL | % Complete | % Spent | Complete | Tasks | Incomplete Tasks | Discrete Tasks | B/L Inchip Tasks | CAM | Element Type | EVM | DQT | VAR | No Logic | Lead | Lag | Start Finish Relationship | Start Start Relationship | Finish Finish Relationship | Hard Constraint | High Float | Float < 0 | High Duration | Forecast Start < Status Date | Forecast Finish < Status Date | Actual Start > Status Date | Actual Finish > Status Date | Finish Finish Relationship with Actual Finish > Baseline Finish |
|------|---------|--------|----|-----|------------|---------|----------|-------|------------------|----------------|------------------|-----|--------------|-----|------|------|----------|------|-----|---------------------------|--------------------------|----------------------------|-----------------|------------|-----------|---------------|------------------------------|-------------------------------|----------------------------|-----------------------------|---|
| 1 | 01 | TRU IA | | 1 | 46.85 | 48.63 | 0 | 1661 | 511 | 496 | 511 | | WBS | NA | EPDQ | scSV | 2 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 450 | 27 | 0 | 0 | 0 | 0 | 684 |
| 11 | 01.08 | New U | | 2 | 48.65 | 50.51 | 0 | 1632 | 497 | 482 | 497 | | WBS | NA | EPDQ | scSV | 1 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 437 | 26 | 0 | 0 | 0 | 0 | 680 |
| 111 | 01.08.0 | Safety | | 3 | 48.65 | 50.51 | 0 | 1613 | 497 | 482 | 497 | | WBS | NA | EPDQ | scSV | 1 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 437 | 26 | 0 | 0 | 0 | 0 | 679 |

Screen Capture next few slides

Schedule Health indicators are metrics designed to provide confidence in the quality of the data being provided from the contractor's EVM System, specifically the schedule system, typically Primavera P6 at DOE. When there are schedule flags, an analyst should investigate further. The schedule health dashboard has three tools which appear in the tri-pane as a start point to look at key indicators of data quality and also include a look at data via the Gantt Chart option as well. First we will take a look at the Sort View

Schedule Health

| DQI | VAR | No Logic | Lead | Lag | Start Finish Relationship | Start Start Relationship | Finish Finish Relationship | Hard Constraint | High Float | Float < 0 | High Duration | Forecast Start < Status Date | Forecast Finish < Status Date | Actual Start > Status Date | Actual Finish > Status Date | Finish Finish Relationship with Actual Finish > Baseline Finish |
|------|------|----------|------|-----|---------------------------|--------------------------|----------------------------|-----------------|------------|-----------|---------------|------------------------------|-------------------------------|----------------------------|-----------------------------|---|
| | | | | | | | | | | | | | | | | |
| EFSI | scSV | 2 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 450 | 27 | 0 | 0 | 0 | 0 | 684 |
| EFSI | scSV | 1 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 437 | 26 | 0 | 0 | 0 | 0 | 680 |
| EFSI | scSV | 1 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 437 | 26 | 0 | 0 | 0 | 0 | 679 |
| EFSI | scSV | 1 | 0 | 0 | 0 | 33 | 39 | 0 | 8 | 291 | 19 | 0 | 0 | 0 | 0 | 362 |

The metrics listed are :

- No Logic
- Float < 0 (negative float)
- Leads
- High Duration
- Lags
- Forecast Start < Status Date
- Start Finish (SF) Relationship
- Forecast Finish < Status Date
- Start Start (SS) Relationship
- Actual Start > Status Date
- Finish Finish (FF) Relationship
- Actual Finish > Status Date
- Hard Constraint
- FF Relationship with Actual Finish > Baseline Finish
- High Float

8

Emphasize EPASOP as a reference, content below from EPASOP
 Discuss Empower DQI nomenclature EFSI (EVMS, Forecast, Schedule, Integration)
 Discuss Empower VAR nomenclature csCSV
 - Standard 10%, except incremental Schedule = 1%; may have more restrictive thresholds in EVMSD

Data integrity indicators are metrics designed to provide confidence in the quality of the data being provided from the contractor’s EVM System. In the last session, we looked at cost system metrics. For this session the focus is on schedule metrics In looking at the sort view for schedule health, the

The Data Quality Indicator Column has up to four flags. E (Earned Value Data), S (Schedule Data), I (Integration Data), and F (Forecast Data). “S” means that one or more Schedule DQI flags is tripped. In this case you can see that three of the metrics indicate flags. One key to note, a flag is not a fail, it means the user should take a closer look. It may be ok or it may indicate an area in the EVMS that needs attention.

The VAR or Variance column indicates that a variance report may be needed. As PARS is used across many systems, the VAR column is set to a percent threshold and

does not include a dollar threshold at this time (it may in the future). A letter in this column mean that there is a likelihood that a Control Account Manager (CAM) should have a Variance report in the Format 5 report placed in the DMS area of PARS. A capital S means the Cumulative Schedule threshold is tripped and a little s means a current period schedule threshold is tripped. It is recommended that the user read the IPMR / CPR format 5 report to gain further insight from the CAM and project manager.

There are 14 schedule metric categories on this view.

- LOGIC - Logic, used in the scheduling sense, is the relationship tasks have to each other. The objective of this metric is to ensure each task has at least one predecessor and successor link, i.e. logic links. Discrete tasks must be linked (have predecessors and successors) in order to properly calculate the Total Float in the project. If the logic is missing, the true critical path for the project is unknown. Even if links exist, the logic still needs to be verified to ensure that the links make sense. Incomplete tasks missing predecessors and/or successors are included in this metric. If this metric yields the result of greater than 5%, it should be considered a flag and justifies further investigation of contractor's schedule to understand why missing logic-ties exist in the schedule. Normally there is only one activity without a predecessor – start project and one activity without a successor – finish project. To get the percentage, you can look in the Audit Metrics.

LEADS - A lead, also called a negative lag, refers to a relationship whereby the successor activity is scheduled to begin before the predecessor activity has completed. For example, say Task 1 and Task 2 have a Finish-Start relationship, so when Task 1 finishes, Task 2 can start. If when Task 2 is planned, a Lag of -1 is added to the predecessor relationship between Task 1 and Task 2, the schedule would then show that Task 2 must start 1 day prior to the last day Task 1 finished. The negative lag is called a lead. When tasks are logically linked, it is important to determine if any leads exist because the critical path and any subsequent analysis can be adversely affected by using leads. The use of leads distorts the total float in the schedule and may cause resource conflicts. In some cases, these leads are used to artificially compress the schedule which results in distorted total float values which is discussed later in this section. The reason for using leads should be documented and have proper justification (preferably in a "notes" column of the schedule). Generally at DOE you should not see a Lead used.

LAG - Lag refers to a relationship whereby the successor activity cannot start right after the end of its predecessor. The objective of this metric is to ensure that lags are not being used to artificially constrain the schedule. The critical path and any subsequent analysis can be adversely affected by using lags. In many cases, these lag

values are appropriately used by the CAMs to represent wait times for government review, waiting for “paint to dry”, etc.

The critical path and any subsequent analysis can be adversely affected by using lags. Lags should not be used to manipulate float/slack or to restrain the schedule. If lags are used to force a task to start/finish on a certain date, the schedule is being artificially restrained and this should be considered an instance of non-compliance during surveillance. The reason for using a lag should be documented and have proper justification (preferably in a “notes” column of the schedule) to discern whether the lag is being used in an appropriate manner.

RELATIONSHIP TYPES - The metric provides a count of incomplete tasks containing each type of logic link. The Finish-to-Start (FS) relationship type (“once the predecessor is finished, the successor can start”) provides a logical path through the project and should account for at least 90% of the relationship types being used. The Start-to-Finish (SF) relationship type is counter-intuitive (“the successor can’t finish until the predecessor starts”) and should very rarely be used, and only with detailed justification. By counting the number of Start-to-Start (SS), Finish-to-Finish (FF), and Start-to-Finish (SF) relationship types, the % of Finish-to-Start (FS) relationship types can be calculated. In the task columns you see the number of incomplete tasks to compare these values with. Again a good target is about 90% FS relationship. Also note that an activity can have both a SS and FF relationship.

- **HARD CONSTRAINTS**

Schedule constraints inflict a restriction on either the start or end date of a discrete task and/or milestone. Hard constraints anchor a schedule or task in time to a specific date regardless of predecessor logic, i.e. dependencies. Soft constraints anchor a task’s start or finish date, but they respect predecessor logic, thus allowing the schedule end date to move to the right should a slip occur. Because hard constraints restrict the schedule, they must be minimized to allow the network schedule to update properly and reflect current status. The calculation used to determine schedule health regarding the use of hard constraints is based on a count of incomplete tasks with hard constraints in use. Hard constraints include: Must-Finish-On (MFO), Must-End-On (MEO), Must-Start-On (MSO), Start-No-Later-Than (SNLT), & Finish-No-Later-Than (FNLT). Soft constraints include As-Late-As-Possible (ALAP), Start-No-Earlier-Than (SNET), and Finish-No-Earlier-Than (FNET). Divide the total number of hard constraints by the number of incomplete tasks. The number of tasks with hard constraints should not exceed 5% and less than 1% is better yet. There should be a justification for each and every hard constraint.

FLOAT – Float is the amount of time a predecessor activity can be delayed without impacting its successor. Total Float is the amount of time an activity can be delayed or

extended before it impacts the project end date. The highest risk to schedule completion includes those activities with the lowest float values. Conversely, activities with unreasonably high amounts of total float indicate missing activities, missing or incomplete logic, and date constraints. When these things occur, the high total float gives a false sense of a cushion toward meeting the project completion date. The schedule should identify reasonable float, sometimes called slack, so that the schedule's flexibility can be determined and monitored.

When evaluating float values is it important to understand:

- Float/total float should always be greater than or equal to zero.
- Negative float indicates a problem with the schedule's achievability.
- Excessive float usually indicates there is a problem with the logic connections.

The two key metrics to focus on when conducting schedule analysis are discussed in the next two paragraphs, i.e. High Total Float and Negative Float.

High Total Float - An incomplete task with total float greater than 44 working days (2 months) is counted in this metric. A task with total float over 44 working days may be a result of missing predecessors and/or successors. If the percentage of tasks with excessive total float exceeds 5%, the network may be unstable and may not be logic driven.

Negative Float - An incomplete task with total float less than 0 working days is included in this metric. It helps identify tasks that are delaying completion of one or more milestones. Negative float also may be an indicator of a constrained activity completion date or activities completed out of sequence. Tasks with negative float should have an explanation and a corrective action plan to mitigate the negative float. Divide the total number of tasks with negative float by the number of incomplete tasks. Ideally, there should not be any negative float in the schedule

Empower has additional tools to look at float slips and latest finish. Under Options, make sure under "Set Gantt Options" that "Show Late Finish" and "Show Slips" are turned on. What this does in a Gantt view is add the light grey to black marks which show what the schedule recorded for finish over the past four reporting periods and the red mark which show the late finish, or the point to which if the activity slips, it will be out of float. These values also are available by hovering over the status bar in the Gantt and shows information on the activity to include the current period Finish date, and Finish 1, 2, and 3 which are what the status schedule reported as finish for the past three period prior. The slips in an activity are apparent and shows if an activity is getting close to the late finish. This will be further explored shortly.

HIGH DURATION - Duration is the estimated amount of time to complete a task. The

purpose of monitoring durations is to ensure that baseline durations are realistic and manageable. The rationale behind this metric is that a task with baseline duration greater than 44 working days should be analyzed to determine whether it can be broken into two or more discrete tasks rather than one. By breaking down the tasks into smaller pieces, it is likely that the tasks will be more manageable and provide better insight into cost and schedule performance. However, care should be taken not to break larger tasks into smaller tasks simply to meet a threshold.

INVALID FORECAST DATES - The objective of this metric is to ensure that forecast start and forecast finish dates are being updated for incomplete tasks. A task should have forecast start and forecast finish dates that are in the future relative to the status date (sometimes called the data date) of the IMS. Tasks that have forecast start and/or finish dates that do not meet the criteria are invalid and indicate that the IMS has not been properly statused. Accurate and updated forecast dates are necessary for good project management, for calculating a valid critical path, and for EVMS compliance in general.

There should be zero tasks with invalid forecast start and/or finish dates

INVALID ACTUAL DATES - The objective of this metric is to ensure that actual start and actual finish dates are valid. These are show on the dashboard as Actual Start > Status Date and Actual Finish > Start Date. A task should not have actual start and actual finish dates that are in the future relative to the status date of the IMS. Tasks that have actual start and/or actual finish dates that meet the criteria are invalid and indicate that the IMS has not been properly statused. Accurate and updated actual start and actual finish dates are necessary for good project management and for calculating a valid critical path. Additionally, invalid actual dates adversely affect “out of sequence tasks” and ultimately affect meeting the correct forecasting required to be EVMS compliant. There should be zero tasks with invalid actual start and/or actual finish dates.



Schedule Health

| DQI | VAR | No Logic | Lead | Lag | Start Finish Relationship | Start Start Relationship | Finish Finish Relationship | Hard Constraint | High Float | Float < 0 | High Duration | Forecast Start < Status Date | Forecast Finish < Status Date | Actual Start > Status Date | Actual Finish > Status Date | Finish Finish Relationship with Actual Finish > Baseline Finish |
|------|------|----------|------|-----|---------------------------|--------------------------|----------------------------|-----------------|------------|-----------|---------------|------------------------------|-------------------------------|----------------------------|-----------------------------|---|
| | | | | | | | | | | | | | | | | |
| EFSE | scSV | 2 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 450 | 27 | 0 | 0 | 0 | 0 | 684 |
| EFSE | scSV | 1 | 0 | 0 | 0 | 52 | 46 | 0 | 27 | 437 | 26 | 0 | 0 | 0 | 0 | 680 |

For this data shown here:

- No Logic – 2 flagged element – appropriate once checked.
- Start Start (SS) Relationship
- Finish Finish (FF) Relationship } 19.1% such that FS is 80.9%
- High Float – Look at DQI Report and the Gantt for the activities
- Float < 0 (negative float) – Understand the negative float and impact
- High Duration – Is there QBD or does this make it hard to track
- FF Relationship with Actual Finish > Baseline Finish – Schedule impact
- VAR – Look at Format 5 Report in DMS

9

- LOGIC – Logic is 2 flag rolled up at the top level, which when looked into, it is acceptable as they are the two which should not have a predecessor or successor

RELATIONSHIP TYPES - The Finish-to-Start (FS) relationship type (“once the predecessor is finished, the successor can start”) provides a logical path through the project and should account for at least 90% of the relationship types being used. Here is it 80.9% of incomplete activities. The goal is 90% or better, but this may be acceptable if a clear understanding of the SS and FF relationships is known. There are no SF which is good. As you check the activities, you may see there are some with both a SS and FF relationship, which is acceptable.

FLOAT –

When evaluating float values is it important to understand:

- Float/total float should always be greater than or equal to zero.
- Negative float indicates a problem with the schedule’s achievability.
- Excessive float usually indicates there is a problem with the logic connections.

The two key metrics to focus on when conducting schedule analysis are discussed in the next two paragraphs, i.e. High Total Float and Negative Float.

High Total Float - An incomplete task with total float greater than 44 working days (2 months) is counted in this metric. A task with total float over 44 working days may be a result of missing predecessors and/or successors. If the percentage of tasks with excessive total float exceeds 5%, the network may be unstable and may not be logic driven. Here the high float is 26%. This is a good time to use the DQI report at lowest level and take a look at the summary line to see what activities have high float, how many days it is, and work to see if it a concern.

Negative Float - An incomplete task with total float less than 0 working days is included in this metric. It helps identify tasks that are delaying completion of one or more milestones. Negative float also may be an indicator of a constrained activity completion date or activities completed out of sequence. Tasks with negative float should have an explanation and a corrective action plan to mitigate the negative float. Divide the total number of tasks with negative float by the number of incomplete tasks. Ideally, there should not be any negative float in the schedule. In this case the negative float is 43% of the incomplete work packages. This is a high amount. For this project they are working on a Baseline Change Proposal as it is too much to recover from.

HIGH DURATION - Duration is the estimated amount of time to complete a task. The purpose of monitoring durations is to ensure that baseline durations are realistic and manageable. The rationale behind this metric is that a task with baseline duration greater than 44 working days should be analyzed to determine whether it can be broken into two or more discrete tasks rather than one. By breaking down the tasks into smaller pieces, it is likely that the tasks will be more manageable and provide better insight into cost and schedule performance. However, care should be taken not to break larger tasks into smaller tasks simply to meet a threshold and you can use quantifiable backup data to help take credit. Using the DQI Report again, you can see the duration days and work to see if this is acceptable in terms of how the activities take credit or if the activities are too big to manage.

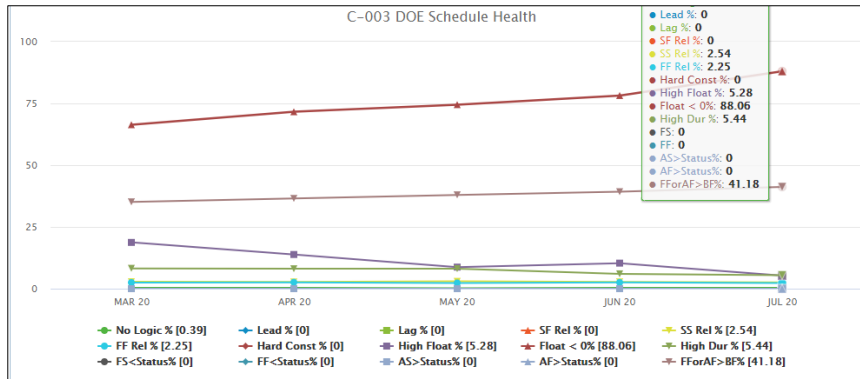
INVALID FORECAST DATES – An activity with a FF relationship, means that a dependent relationship can not end until it does. If this is the case and the AF date is greater than the Baseline Finish date, what else was impacted. A user should check to see if the impacts are correctly shown.

For this project, the schedule health should be considered in terms of whether it will provide you with accurate data and what impact this has on forecasting. If the schedule has a lot of issues, it is likely the integration with the cost system may as

well. If Costs are off or not reflected well for BCWS, BCWP, or ACWP, this ability to have realistic knowledge for decision makers is reduced. After doing the upfront analysis for the project, then using the chart to consider this metrics over time lets the user determine if it is getting worse or better.



DOE Schedule Health Chart



- The DOE Schedule Health Chart, as part of the dashboard, reflects flags over time to let the user look at data quality trends over time.
- Remember that you can turn on and off each item in legend as needed to view the data.

10

The DOE Schedule Health chart packaged with the dashboard, lets the user take a look at the number of flags for each metric over time to the user see what the changes from period to period. The user would target to understand each of the flags and look for both increase and decrease in the number of flags as they prepared to assess the project performance.



Schedule Health – Schedule Assessment Report

Schedule Assessment

| Linked Tasks | Complete Tasks | Incomplete Tasks | Incomplete Discrete Tasks | Planned Completions | Actual Completions | Relationship Count |
|--------------|----------------|------------------|---------------------------|---------------------|--------------------|--------------------|
| 1,661 | 1,150 | 511 | 496 | 1,233 | 1,032 | 2,046 |

| Metric | Description | Goal | Percent | Count |
|--------------------------|---|---------|---------|---------------|
| Logic | Missing predecessors, successors or both | <= 5 % | 0.39 % | 2 |
| Leads | Number of leads | 0 % | 0.00 % | 0 |
| Lags | Number of lags | 0 % | 0.00 % | 0 |
| Relationship Type | Finish-To-Start | > 90 % | 95.21 % | 1,948 |
| | Finish-To-Finish | <= 10 % | 4.79 % | 46 |
| | Start-To-Start | | | 52 |
| | Start-To-Finish | 0 % | 0.00 % | 0 |
| Hard Constraints | MSON, MFON, SNLT, FNLT | <= 5 % | 0.00 % | 0 |
| High Float | Total Float > 44 Days | <= 5 % | 5.28 % | 27 |
| Negative Float | Total Float < 0 Days | 0 % | 88.06 % | 450 |
| High Duration | Baseline Duration > 44 Days | <= 5 % | 5.44 % | 27 |
| Invalid Dates | Invalid Forecast Start/Finish Dates | 0 % | 0.00 % | 0 |
| | Invalid Actual Start/Finish Dates | 0 % | 0.00 % | 0 |
| Missed Tasks | Tasks not performing to baseline plan | <= 5 % | 55.47 % | 684 |
| Baseline Execution Index | Performance relative to baseline | > 95 % | 83.70 % | 1,032 / 1,233 |
| Inconsistent Status | No Actual Finish but Percent Complete = 100 % | 0 % | 0.00 % | 0 |
| | Actual Finish with Percent Complete < 100 % | 0 % | 0.00 % | 0 |
| | Out of sequence status | 0 % | 4.03 % | 67 |

- The schedule assessment report provides a good snapshot
- Use with lowest level and select the summary element.
- Linked Tasks means there is a link observed between both the cost and schedule tools.

The Schedule Assessment Report, provides a good snapshot of the schedule and many of the related metrics. Like the DQI report, it is best to use at the lowest level on a summary element. You can also look at specific control account with all of the lowest level summed or other ways. Looking at it at the lowest level and establishing a summary makes sure the bad performance on one control account does not get overshadowed by good performance on another at a higher level. This report can help you identify areas of concern for further investigation, focusing on the red highlighted under the “Percent” column of the report. For the high float – you can look at the DQI report to see which activities are listed and then check them out on the Gantt chart. The negative float is a big deal and again use the DQI or a pre-filter to see which activities are providing this problem as well as some of the other charts. Consider the missed tasks and BEI as others which are a problem to look at.



Schedule Health – DQI Report

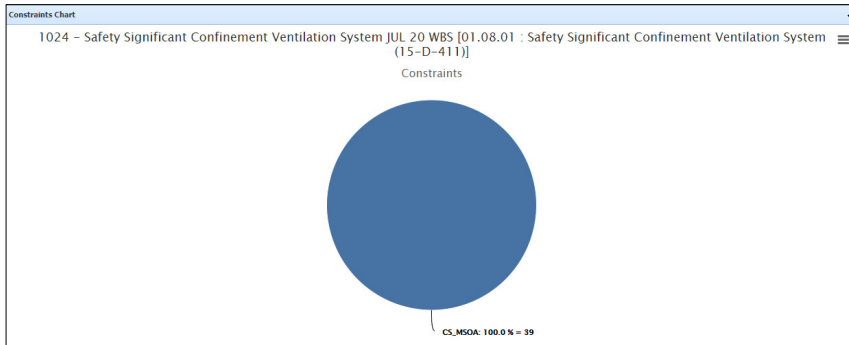
| Data Quality Indicators Report | | | |
|---|---|--|-------------|
| No successor (2) UIDs MSCD4BL3000, NFBBL19750a | S | | PASEG, 10.1 |
| SS relationship (52) UIDs AHBL22250 AHBL22246, AHBL22261 AHBL22267, AHBL22269 AHBL22274, AHBL22271 AHBL22263, AHBL22280 AHBL22207, FABBL221 FABBL110, FH71005 FH71010, FH71015 FH71005, FH71201 FH71101, FH72001 FH71901, FH72101 FH72001, FH72105 FH71510, FH72201 FH72101, NFBBL01125 NFBBL1082, NFBBL1039 NFBBL1036a, NFBBL1043 NFBBL1039, NFBBL1049a NFBBL1014a, NFBBL1100a NFBBL1248, NFBBL1101 NFBBL1998, NFBBL1106 NFBBL1068a, NFBBL1115 NFBBL1105a, NFBBL1127 NFBBL1082, NFBBL1135 NFBBL1125, NFBBL1165 NFBBL1455, NFBBL1170 NFBBL1165, NFBBL1180a NFBBL1172a, NFBBL1182 NFBBL1172a, NFBBL1187 NFBBL1248, NFBBL1180 NFBBL1182, NFBBL1190 NFBBL1260, NFBBL1480 NFBBL1440, NFBBL0SL005 NFBBL0SL002, NFBBLMP105 NFBBLMP105, NFBBLWSW408 NFBBLWSW409, NFBBLWSW550 NFBBLWSW522, SRBBL0434 SRBBL5999, SRBBL0436 SRBBL0489, SRBBL0437 SRBBL479, SRBBL0438 SRBBL0489, SRBBL0489 SRBBL479, SRBBL1000a SRBBL6060, SRBBL5999 SRBBL4001, SRBBL6029 SRBBL5999, SRBBLMP109a SRBBLMP109a, SRBBLMP110a SRBBLMP109a, SRBBLMP111a SRBBLMP110a, SRBBLMP112a SRBBLMP111a, SRBBL0230 SRBBL0240, SUBL1400 NFBBL0287, SUBL2200 SUBL150, SUBL2250 SUBL2200. | S | | PAP. 4.4 |
| FF relationship (46) UIDs AHBL22284 AHBL22288, AHBL22287 AHBL22274, AHBL22301 AHBL22424b, AHBL6200a AHBL22297, AHBL6300a AHBL2201, FABBL281 FABBL286, FH7120 FH70115, FH71220 FH70315, FH71505 FH70515, FH71515 FH70415, FH70520 FH70515, FH71520 FH70515, FH71020 FH71015, FH71115 FH71105, FH71120 FH71115, FH71205 FH70705, FH71220 FH71215, FH71315 FH71305, FH71320 FH71315, FH71515 FH71505, FH71520 FH71515, FH71720 FH71715, FH71915 FH71905, FH72015 FH72005, NFBBL1014a NFBBLMP105, NFBBL1014a NFBBLMP105, NFBBL1067 FH70425, NFBBL1067 FH70825, NFBBL1077 FH71425, NFBBL1077 FH71625, NFBBL1077 FH71825, NFBBL1125 NFBBL1115, NFBBL1165 NFBBL1180a, NFBBL1180b NFBBL6369, NFBBL1180b NFBBL6369, NFBBL1235 NFBBL1024a, NFBBL1235 NFBBL1155, NFBBL1140 NFBBL1120, NFBBL1150 NFBBL1140, NFBBL0SL002 NFBBL0SL001, NFBBLWSW590 NFBBL1400, SRBBL479 SRBBL0470, SRBBL0228 SRBBL0214, SRBBL0228 SRBBL0214, SRBBL0228 SRBBL0223, SRBBL0228 SRBBL0223, SRBBL0228 SRBBL0223. | S | | PAP. 4.4 |
| High float (27) UIDs FABBL3395 (117d), FHBL6486 (63d), FHBL6487 (63d), FHBL6488 (63d), NFBBL01656a (66d), NFBBL01656a (66d), NFBBL01650a (66d), NFBBL0166 (66d), NFBBL0345650a (66d), NFBBL0370FB (74d), NFBBL0401 (66d), NFBBL0403 (66d), NFBBL0411 (66d), NFBBL1100 (66d), NFBBL1150 (66d), NFBBL1200a (66d), NFBBL153 (127d), NFBBL19700 (66d), NFBBL3196 (137d), NFBBL0SL001 (31d), NFBBL0SL002 (63d), NFBBL0SL002 (63d), NFBBL0SL000 (264d), NFBBL0SL005 (264d), SRBBL6029 (212d), SRBBL6050 (212d), SRBBL0208 (157d). | S | | PAP. 4.6 |
| Negative float (450) UIDs AHBL22152 (-22d), AHBL22197 (-103d), AHBL22195 (-35d), AHBL22202 (-17d), AHBL22210a (-35d), AHBL22231 (-13d), AHBL22234 (-85d), AHBL22239 (-47d), AHBL22246 (-36d), AHBL22250 (-49d), AHBL22251 (-87d), AHBL22255 (-97d), AHBL22258 (-97d), AHBL22261 (-197d), AHBL22263 (-167d), AHBL22266 (-197d), AHBL22267 (-195d), AHBL22269 (-175d), AHBL22271 (-162d), AHBL22274 (-175d), AHBL22277 (-227d), AHBL22279 (-197d), AHBL22282 (-237d), AHBL22285 (-217d), AHBL22297 (-175d), AHBL22299 (-227d), AHBL22294 (-97d), AHBL22295 (-97d), AHBL22297 (-156d), AHBL22298 (-156d), AHBL23300 (-237d), AHBL23301 (-237d), AHBL23302 (-237d), AHBL22424b (-245d), AHBL6200a (-141d), AHBL6300a (-212d), CAMBL0350 (-39d), CAMBL0361 (-116d), CAMBL0400 (-116d), DEMOBL150 (-308d), DEMOBL1400 (-263d), DEMOBL1450 (-308d), DEMOBL1500 (-308d), DEMOBL150 (-308d), DEMOBL1600 (-308d), FH70115 (-161d), FH70120 (-161d), ... | | | |

- Those items with an “S” for schedule in the DQI report help you see the magnitude as well as which activities to look at to identify impact for items that are flagged.
- Use with lowest level and select the summary element.
- Use in conjunction with the Schedule Health Assessment Report

The DQI report helps provide “S” flagged items and displays with the unique identifier and the impact. For example – there is a section for High Float you saw in the schedule assessment report. Here they are listed by activity and how many days of float each have. You can look at these on the Gantt to see where and how they impact. Also note the list of activities with negative float.



Schedule Health Charts



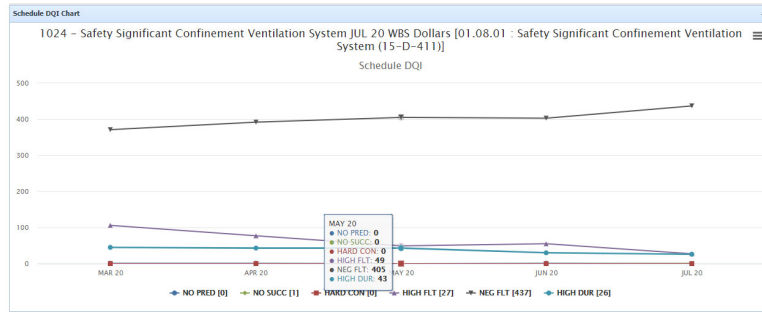
- There is a chart to show what constraints are on the schedule. This chart is under the Schedule Analysis part of the chart menu.
- The other charts under Schedule Analysis will be discussed later.

13

There is a pie chart in Empower to let the user quickly see the types and number of constraints in a schedule. This is part of data quality. There are many other charts for schedule, but these will be discussed later as part of performance, rather than schedule health / data quality.



Schedule Health Charts



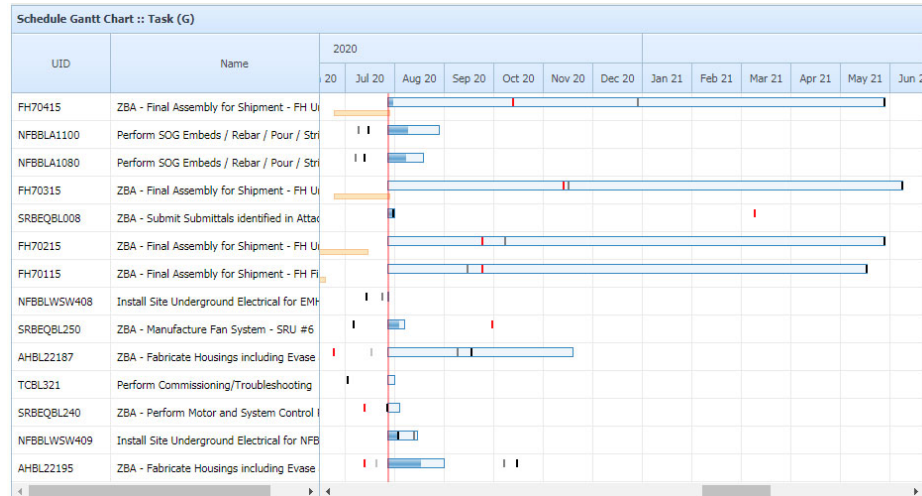
- There are two other Schedule DQI charts with less items than the DOE Schedule Health Chart – one with numbers and one with percent.
- These are also under Charts - Schedule Analysis

14

This chart is one of the two other Data Quality Indicator charts for Schedule. This does breakout the logic to no pred or no successor. Again this can help with looking at issues over time.



Schedule Health Charts



The Gantt Chart provide a way to look at the items which have data quality / schedule health concerns. You will use this to look at performance also with trends and variances later, but it can help see what the quality of the schedule looks like by scanning it.

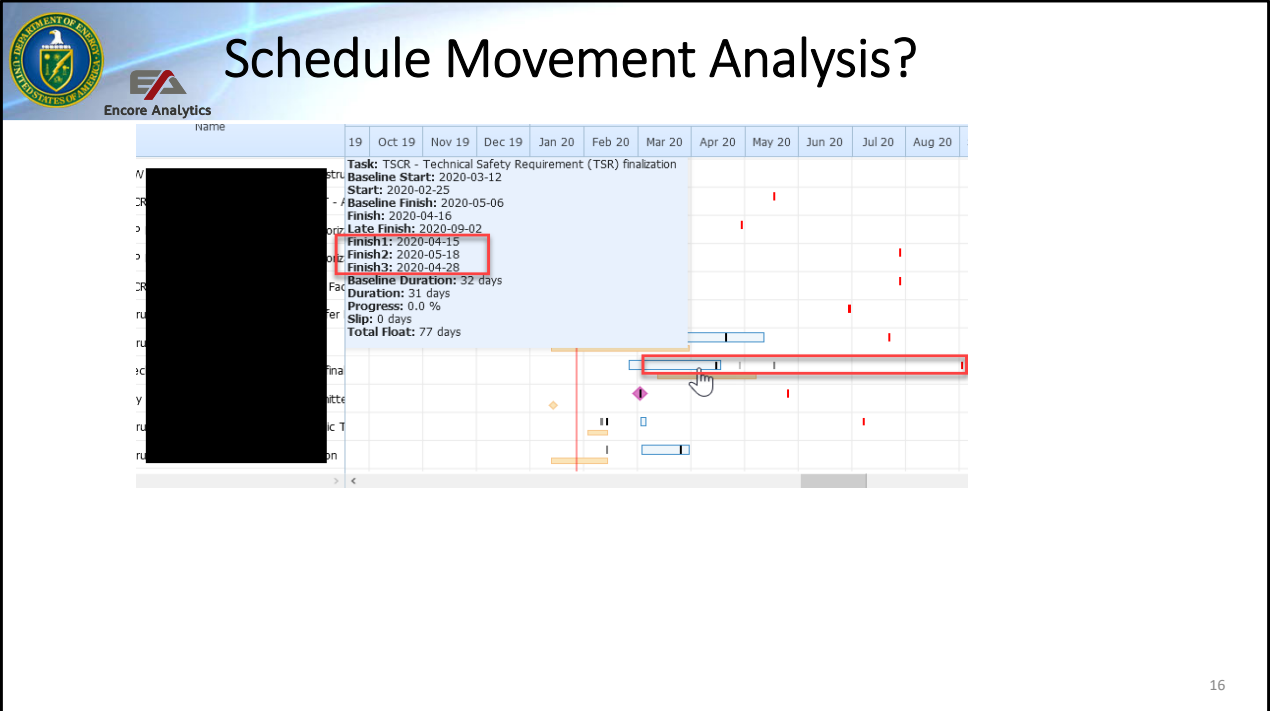
15

The Gantt Chart, helps the user look at the quality of the schedule both for performance and for schedule health. You can see that the project is slipping each month (performance issue) and that the status schedule is not performing with the with the baseline plan. The Gantt can be used to check on logic – look at the activity without a predecessor or successor. Take a look at high float and see why. Check what the CAMs and PM list in the Format 5 report.

Explain red, grey, yellow, blue

- red: when is late finish and no more float available. When red line in the middle of status have negative float or are on critical path
- black, grey: black is last month reported forecast finish, each grey successive color is month prior, live view of slippage in time. Current plus three prior periods of forecast finish.
- yellow bar: baseline
- blue bar: forecast with dark blue for status

Is this how you would like your Gantt to look?
Take a look at your Gantt, what do you see?



Another indicator of Baseline Volatility is the constant movement of schedule activities. In this case Empower can provide drill down Baseline Volatility Report to see the BCWS changes or ETC changes down to the lowest level data. If the schedule is present, that can be show by going to the Gantt chart and select the desire element for analysis.

When looking at the Gantt Chart, you must have the Gantt Options set to show slips and they will be shown in Gantt as vertical pipe symbols ‘|’. A Black pipe will represent the Finish1 which is last months, dark grey will represent Finish2, two months ago and light grey is Finish3, three months ago. If your Gantt has all three showing that means Empower detected that during the last quarter of data, there are changes in the Finish data provided for each month. The Volatility report should correspond to the changes in the schedule. In this case, you can identify the Activities that change and inquire as to:

- Are they moving right, left or all over the place? Why?
- What cause this Finish slip; What constraint or issue was encountered.
- During your assessment , what can be learned to provide more stability to future planned events?
- Was this a rolling wave event or poor planning causing a slip?
- Is this systemic?



Schedule Health

Audit Metrics Report

| B.06. | 01 | Number of incomplete non-LOE BL IMS activities (excludes milestones, summaries, SMs, SVTs, ZBAs and PPs) with duration > 44 days | | 65 | 398 | 16.3 % | <= 10% | |
|-------|----|--|---|----|-----|--------|--------|--|
| | 01 | FC IMS push test result is not consistent with change | * | * | * | * | = 0% | |
| | 02 | FC IMS pull test result is not consistent with change | * | * | * | * | = 0% | |
| | 03 | Number of incomplete activities (excluding LOE) that are on the BL IMS critical path (8) | | 58 | 544 | 10.7 % | <= 40% | |
| | 04 | Number of incomplete activities (excluding LOE) that are on the FC IMS critical path (8) | | 48 | 544 | 8.8 % | <= 40% | |
| | 05 | Number of incomplete LOE BL IMS activities on the critical path | | 0 | 17 | 0.0 % | = 0% | |
| | 06 | Number of incomplete LOE FC IMS activities on the critical path | | 0 | 17 | 0.0 % | = 0% | |
| | 07 | Number of incomplete BL IMS discrete activities (excludes summaries, SMs, SVTs, ZBAs) with >15 predecessor activities | | 9 | 511 | 1.8 % | <= 5% | |
| B.07. | 08 | Number of incomplete FC IMS discrete activities (excludes summaries, SMs, SVTs, ZBAs) with >15 predecessor activities | | 9 | 511 | 1.8 % | <= 5% | |
| | 09 | Number of activities on the BL IMS longest (critical) path that does not follow a logical sequence of work | + | ? | 86 | * | = 0% | |
| | 10 | Number of activities on the FC IMS longest (critical) path that does not follow a logical sequence of work | + | ? | 855 | * | = 0% | |
| | 11 | Number of incomplete discrete activities in BL IMS where total float >=10% of the number of work days from CPP date to planned completion date | * | * | * | * | <= 10% | |

For further analysis into compliance, the Audit Metrics report and export are used. This will have a full session to discuss.

17

Empower has incorporated a metrics report which captures all of the DOE compliance metrics for an EVMS. Of these – about 50% are automated and the balance are a hybrid or manual test. Many of the Guideline 6 or scheduled metrics are automated.

This will be discussed in detail in the final session of this course.

- means manual
- + to left of ? means automated Y and manual entry X
- ? means able to enter an X value, hybrid metric (auto/manual) – work with PARS team to enter X values such as notes to investigate a metric, hybrid (auto/manual) entry, or manuals

Anyone who wants to work with manual entry of X,



Checks on Learning – Schedule Health

1178 - Tank Side Caesium Removal System Demonstration Subproject - 20 WBS Dollars - 0-803 DCE Schedule Health - 5-803 DCE Schedule Health

| HIER | WBS | DESCRIPTION | LL | LVL | % Complete | % Spent | Complete | Tasks | Incomplete Tasks | Concrete Tasks | BL Dump Tasks | CAN | Element Type | EVM | DQI | VAR | No Logic | Lead | Lag | Start Finish Relationship | Start-Start Relationship | Finish-Finish Relationship | Hard Constraint | High Float | Float < 0 | High Duration | Forecast Start < Status Date | Forecast Finish < Status Date | Actual Start > Status Date | Actual Finish > Status Date | Finish Finish Relationship with Actual Finish > Baseline Finish |
|------|------------|---------------------------|----|-----|------------|---------|----------|-------|------------------|----------------|---------------|-----|--------------|-----|------|-----|----------|------|-----|---------------------------|--------------------------|----------------------------|-----------------|------------|-----------|---------------|------------------------------|-------------------------------|----------------------------|-----------------------------|---|
| 1 | 5 | River Protection Project | | 1 | 55.68 | 54.89 | 0 | 751 | 264 | 259 | 264 | | WBS | NA | EFSE | 3 | 0 | 0 | 0 | 26 | 67 | 0 | 81 | 10 | 42 | 0 | 0 | 0 | 0 | 0 | 397 |
| 11 | 5.05 | Treat Waste | | 2 | 60.38 | 59.52 | 0 | 751 | 264 | 259 | 264 | | WBS | NA | ESI | 3 | 0 | 0 | 0 | 26 | 67 | 0 | 81 | 10 | 42 | 0 | 0 | 0 | 0 | 0 | 397 |
| 111 | 5.05.40 | LAWPS - Caesium Removal | | 3 | 60.38 | 59.52 | 0 | 751 | 264 | 259 | 264 | | WBS | NA | ESI | 3 | 0 | 0 | 0 | 26 | 67 | 0 | 81 | 10 | 42 | 0 | 0 | 0 | 0 | 0 | 397 |
| 1111 | 5.05.40.01 | Tank Side Caesium Removal | | 4 | 85.72 | 92.87 | 0 | 207 | 36 | 35 | 36 | | WBS | NA | EFSE | 0 | 0 | 0 | 0 | 7 | 12 | 0 | 5 | 10 | 5 | 0 | 0 | 0 | 0 | 146 | |

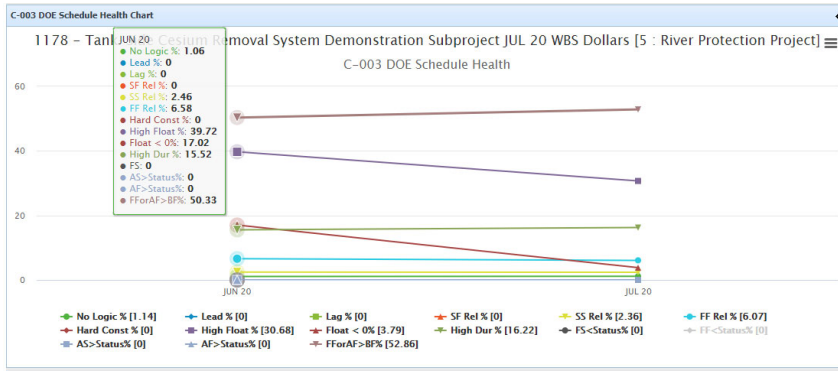
- In looking at the Schedule Health Sort View what does the DQI for 5.05.40 indicate?
 - There is a flag for Cost and Schedule Integration Only
 - ESI means that the data is not acceptable as an upload
 - There is a flag for further investigation for cost, schedule, and integration
 - The project will not be able to complete on budget or schedule
 - Answers C and D are correct

- High Float means
 - If there are more than about 5% with high float, the schedule may have missing logic and could be unstable
 - Should have further investigation as to why
 - Means the project cannot recover
 - All are correct
 - A and B are correct

- Negative Float means
 - There are activities which are delaying milestones
 - There may be constrained activity completion dates to look into
 - Activities may be getting completed out-of-sequence
 - Both A and B are correct
- Variance (VAR) with s means
 - There is a likely requirement for a VAR narrative to be written and submitted in Format 5 report in DMS
 - A threshold in Empower was triggered based on percentage to highlight the need for a VAR for current period schedule.
 - No VAR is needed
 - Answers A and B are correct
 - Answer B and C are correct



Checks on Learning – Schedule Health



- What does Float dropping from 17 days to 3.7 days mean?
 - The project used up float with activities slipping between the two periods
 - User should look at what schedule items are slipping and their impact
 - You can not tell with only two periods.
 - All of the Above
 - A and B only
- What does Lead and Lag at 0% mean?
 - There should not be lead – so this is good.
 - There should not be lag – so this is good
 - Not able to tell from this chart
 - A and B are correct
- Is SF Rel % = 0 good?
 - Yes.
 - No



Checks on Learning – Schedule Health

| Schedule Assessment Report | | | | | | |
|---|---|------------------|---------------------------|---------------------|--------------------|--------------------|
| 1178 - Tank-Side Cesium Removal System Demonstration Subproject JUL 20 WBS [SUMMARY : LL=x] | | | | | | |
| Schedule Assessment | | | | | | |
| Linked Tasks | Complete Tasks | Incomplete Tasks | Incomplete Discrete Tasks | Planned Completions | Actual Completions | Relationship Count |
| 751 | 487 | 264 | 259 | 455 | 400 | 1,103 |
| Metric | Description | Goal | Percent | Count | | |
| Logic | Missing predecessors, successors or both | <= 5 % | 1.14 % | 3 | | |
| Leads | Number of leads | 0 % | 0.00 % | 0 | | |
| Lags | Number of lags | 0 % | 0.00 % | 0 | | |
| Relationship Type | Finish-To-Start | > 90 % | 91.57 % | 1,010 | | |
| | Finish-To-Finish | | | 67 | | |
| | Start-To-Start | <= 10 % | 8.43 % | 26 | | |
| | Start-To-Finish | 0 % | 0.00 % | 0 | | |
| Hard Constraints | MSON, MFON, SNLT, FNLT | <= 5 % | 0.00 % | 0 | | |
| High Float | Total Float > 44 Days | <= 5 % | 30.65 % | 81 | | |
| Negative Float | Total Float < 0 Days | 0 % | 3.79 % | 10 | | |
| High Duration | Baseline Duration > 44 Days | <= 5 % | 16.22 % | 42 | | |
| Invalid Dates | Invalid Forecast Start/Finish Dates | 0 % | 0.00 % | 0 | | |
| | Invalid Actual Start/Finish Dates | 0 % | 0.00 % | 0 | | |
| Missed Tasks | Tasks not performing to baseline plan | <= 5 % | 87.25 % | 397 | | |
| Baseline Execution Index | Performance relative to baseline | > 95 % | 87.91 % | 400 / 455 | | |
| Inconsistent Status | No Actual Finish but Percent Complete = 100 % | 0 % | 0.27 % | 2 | | |
| | Actual Finish with Percent Complete < 100 % | 0 % | 0.00 % | 0 | | |
| | Out of sequence status | 0 % | 3.46 % | 26 | | |

8. In looking at the Schedule Assessment Report, the user
 - A. Should review and understand the high float.
 - B. Should review and understand the negative float.
 - C. Should ensure there is a good reason for the high duration activities.
 - D. Look at what tasks are moved to the right due to a BEI less than 0.95
 - E. Use the DQI report to see what activities are driving these indicators.
 - F. All are correct

9. The high float percentage are based on 81 activities with float over 44 days / 264 incomplete task.
 - A. True
 - B. False

10. The high float percentage are based on 81 activities with float over 44 days / 751 tasks
 - A. True
 - B. False



Checks on Learning – Schedule Health

Data Quality Indicators Report

| | | |
|---|---|----------|
| FF relationship (67): UIDs LAWPSFY20F, LAWPSFY20LOEF, LAWPSFY20F-PBI-61.0.1, LAWPSFY20F-PBI-61.0.12, LAWPSFY20F-PBI-61.0.3, LAWPSFY20F-PBI-61.0.5, LAWPSFY20F-PBI-61.0.6, LAWPSFY20F-PBI-61.0.7, LAWPSFY20F-PBI-61.0.8, LAWPSFY20F-PBI-61.0.9, LAWPSFY20F-Z-C500-00, LAWPSFY20F-Z-C501-00, LAWPSFY20F-Z-C546-00, LAWPSFY20F-Z-C921-06, LAWPSFY20F-Z-C921-07, LAWPSFY20LOEF-Z-C217-00, LAWPSFY20LOEF-Z-C220-00, LAWPSFY20LOEF-Z-C222-00, LAWPSFY20LOEF-Z-C900-00, OY-C145-00, OY-C002-10, OY-C212-00, OY-C250-00, OY-C219-00, OY-C189-00, OY-C220-00, OY-C129-00, OY-C234-00, ZT-C126-00, OY-C298-00, OY-C126-00, OY-C297-00, OY-C194-00, OY-C274-10, OY-C276-00, OY-C275-00, OY-C274-10, OY-C370-00, OY-C380-00, PBI-61.0.10, PBI-61.0.10SVT, PBI-61.0.3, PBI-61.0.3SVT, PBI-61.0.3FF, ZT-C124-15, PBI-61.0.4, PBI-61.0.4SVT, PBI-61.0.5, PBI-61.0.5SVT, PBI-61.0.5FF, ZT-C129-45, PBI-61.0.6, PBI-61.0.6SVT, Y7-5345-00, Y7-5345-00, Y7-5645-00, Y7-5650-00, Y7-5670-00, ZT-C919-00, ZT-C129-30, ZT-C129-55, ZT-C129-30, ZT-C129-25, ZT-C204-00, ZT-C806-10, ZT-C239-00, Y7-3500-00, ZT-C513-00, ZT-C512-00, ZT-C519-00, ZT-C516-00, ZT-C521-00, ZT-C585-00, ZT-C523-00, Y7-1346-00, ZT-C525-00, ZT-C146-00, ZT-C943-00, ZT-C523-00, ZT-C550-00, ZT-C533-00, ZT-C550-10, ZT-C533-00, ZT-C550-10, ZT-C589-00, ZT-C581-00, ZT-C589-00, ZT-C581-00, ZT-C589-00, ZT-C562-00, ZT-C560-00, ZT-C565-00, Y640-4110-36, ZT-C800-00, ZT-C813-00, ZT-C806-10, ZT-C806-05, ZT-C806-20, ZT-C806-15, ZT-C806-30, ZT-C806-25, ZT-C806-45, ZT-C806-50, ZT-C806-45, ZT-C806-50, ZT-C806-55, ZT-C809-00, ZT-C809-10, ZT-C815-00, ZT-C811-00, ZT-C828-00, ZT-C814-00, ZT-C921-06, ZT-C921-05, ZT-C921-07, ZT-C921-01. | S | PAP. 4.4 |
| High float (81): UIDs COV-19P2 (46d), LAWPSFY20F (261d), LAWPSFY20LOEF (367d), M-062-54B (186d), M-090-14 (171d), OY-C127-00 (68d), OY-C161-00 (140d), OY-C223-00 (144d), OY-C236-00 (124d), OY-C269-00 (66d), OY-C270-00 (127d), OY-C271-00 (79d), OY-C272-00 (127d), OY-C273-00 (127d), OY-C350-00 (46d), OY-C360-00 (53d), OY-C370-00 (46d), OY-C380-00 (63d), OY-C390-00 (46d), OY-C400-00 (46d), Y640-4110-04 (67d), Y640-4110-04 (100d), Y7-1500-00 (61d), Y7-1530-00 (61d), Y7-5481-00 (77d), Y7-5505-00 (145d), Y7-5510-00 (130d), Y7-5515-00 (130d), Y7-5710-00 (158d), ZT-C028-10 (53d), ZT-C032-00 (62d), ZT-C035-00 (59d), ZT-C096-00 (130d), ZT-C098-00 (82d), ZT-C102-10 (120d), ZT-C104-00 (150d), ZT-C109-00 (130d), ZT-C131-10 (53d), ZT-C133-00 (84d), ZT-C135-00 (84d), ZT-C189-00 (70d), ZT-C201-00 (56d), ZT-C223-00 (144d), ZT-C239-00 (115d), ZT-C248-00 (64d), ZT-C260-10 (54d), ZT-C264-00 (64d), ZT-C265-00 (72d), ZT-C266-00 (49d), ZT-C270-00 (56d), ZT-C280-00 (46d), ZT-C290-00 (46d), ZT-C300-00 (66d), ZT-C310-00 (66d), ZT-C330-00 (56d), ZT-C340-00 (46d), ZT-C500-00 (57d), ZT-C501-00 (96d), ZT-C518-00 (91d), ZT-C519-00 (91d), ZT-C521-00 (48d), ZT-C527-00 (48d), ZT-C534-00 (80d), ZT-C548-00 (75d), ZT-C565-00 (48d), ZT-C802-15 (142d), ZT-C802-20 (142d), ZT-C805-00 (132d), ZT-C806-25 (59d), ZT-C806-30 (59d), ZT-C806-35 (47d), ZT-C806-40 (47d), ZT-C806-45 (59d), ZT-C806-50 (59d), ZT-C806-55 (59d), ZT-C807-05 (53d), ZT-C824-00 (56d), ZT-C826-10 (58d), ZT-C828-00 (52d), ZT-C900-00 (367d). | S | PAP. 4.6 |
| Negative float (10): UIDs PBI-61.0.10 (-47d), PBI-61.0.10SVT (-47d), PBI-61.0.10SVT (-78d), ZT-C531-00 (-47d), ZT-C533-00 (-47d), ZT-C560-00 (-32d), ZT-C561-00 (-36d), ZT-C562-00 (-44d), ZT-C563-00 (-44d), ZT-C564-00 (-47d). | S | PAP. 4.7 |
| High duration (42): UIDs OY-C147-00 (118d), OY-C182-00 (82d), OY-C216-00 (136d), OY-C217-00 (144d), OY-C221-00 (152d), OY-C222-00 (187d), OY-C223-00 (136d), OY-C235-00 (144d), OY-C240-00 (157d), OY-C241-00 (125d), OY-C330-00 (100d), OY-C370-00 (50d), Y640-4110-02 (100d), Y640-4110-04 (100d), Y7-1520-00 (71d), C189-00 (201d), ZT-C215-00 (201d), ZT-C216-00 (201d), ZT-C223-00 (201d), ZT-C224-00 (201d), ZT-C239-00 (117d), ZT-C290-00 (47d), ZT-C500-00 (45d), ZT-C501-00 (45d), ZT-C525-00 (56d), ZT-C527-00 (163d), ZT-C548-00 (167d), ZT-C550-00 (201d), ZT-C550-10 (112d), ZT-C565-00 (157d), ZT-C800-00 (111d), ZT-C801-00 (115d), ZT-C805-00 (116d), ZT-C806-05 (49d), ZT-C806-15 (61d), ZT-C806-25 (61d), ZT-C806-45 (61d), ZT-C806-55 (61d), ZT-C807-05 (61d), ZT-C807-20 (64d), ZT-C815-00 (75d), ZT-C828-00 (100d). | S | PAP. 4.8 |
| Missed target finish date (397): UIDs COV-19P2, COV-19P3, LAWPS-S-TM1225, LAWPS-S-TM1235, LAWPS-S-TM1245, LAWPS-S-TM1255, LAWPS-S-TM1265, LAWPS-S-TM1285, LAWPS-S-TM1295, LAWPS-S-TM1305, LAWPS-S-TM1315, LAWPS-S-TM1325, LAWPS-S-TM1335, LAWPS-S-TM1345, LAWPS-S-TM1345, LAWPS-S-TM1345, LS-W211-0010, LS-W211-0020, LS-W211-0030, M- | | |

11. The data quality report is used to
 - A. take a deeper dive into data quality.
 - B. Provides data quality indicators based on Department of Defense and Department of Energy metrics.
 - C. Provides the activity ID and value for each item flagged.
 - D. Provides the Negative Float and how many days each activity have negative.
 - E. List the activities with high duration
 - F. Shows the FF relationships
 - G. All are correct



Schedule Health – DQI Report

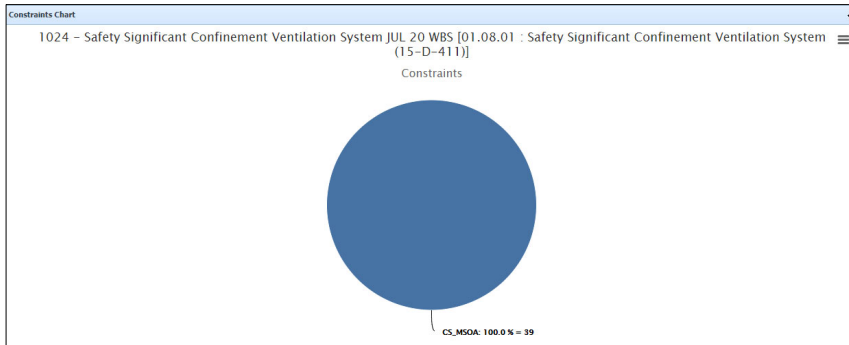
| Data Quality Indicators Report | | | |
|--|---|--|-------------|
| No successor (2) UIDs MSCD4BL3000, NFBBL19750a | S | | PASEG, 10.1 |
| SS relationship (52) UIDs AHBL22250 AHBL22246, AHBL22261 AHBL22267, AHBL22269 AHBL22274, AHBL22271 AHBL22263, AHBL22280 AHBL22207, FABBL251 FABBL1116, FH71005 FH71010, FH71015 FH71005, FH71201 FH71101, FH72001 FH71901, FH72101 FH72001, FH72105 FH71510, FH72201 FH72101, NFBBL01125 NFBBL1082, NFBBL1039 NFBBL1036a, NFBBL1043 NFBBL1039, NFBBL1049a NFBBL1014a, NFBBL1100a NFBBL1248, NFBBL1101 NFBBL1988, NFBBL1106 NFBBL1068a, NFBBL1115 NFBBL1105a, NFBBL1127 NFBBL1082, NFBBL1135 NFBBL1125, NFBBL1165 NFBBL1455, NFBBL1170 NFBBL1165, NFBBL1180a NFBBL1172a, NFBBL1182 NFBBL1172a, NFBBL1187 NFBBL1248, NFBBL1180 NFBBL1182, NFBBL1190 NFBBL1260, NFBBL1480 NFBBL1440, NFBBL03L005 NFBBL03L002, NFBBLMP105 NFBBLMP105, NFBBLWSV408 NFBBLWSV409, NFBBLWSV550 NFBBLWSV522, SRBBL0434 SRBBL599, SRBBL0436 SRBBL0489, SRBBL0437 SRBBL479, SRBBL0439 SRBBL0489, SRBBL0489 SRBBL479, SRBBL1600a SRBBL0600, SRBBL599 SRBBL4001, SRBBL6029 SRBBL599, SRBBLMP109a SRBBLMP109a, SRBBLMP110a SRBBLMP109a, SRBBLMP111a SRBBLMP110a, SRBBLMP112a SRBBLMP111a, SRBBL03L200 SRBBL03L200, SUBL1400 NFBBL01267, SUBL2200 SUBL1500, SUBL2350 SUBL2200 | S | | PAP. 4.4 |
| FF relationship (46) UIDs AHBL22284 AHBL22258, AHBL22287 AHBL22274, AHBL22301 AHBL22424b, AHBL2200a AHBL22297, AHBL6300a AHBL2201, FABBL281 FABBL268, FH70120 FH70115, FH70320 FH70315, FH70506 FH70515, FH70515 FH70415, FH70520 FH70515, FH70620 FH70615, FH71020 FH71015, FH71115 FH71105, FH71120 FH71115, FH71205 FH70705, FH71220 FH71215, FH71315 FH71305, FH71320 FH71315, FH71515 FH71505, FH71520 FH71515, FH71720 FH71715, FH71915 FH71905, FH72015 FH72005, NFBBL1014a NFBBLMP105, NFBBL1014a NFBBLMP105, NFBBL1067 FH70425, NFBBL1067 FH70825, NFBBL1077 FH71425, NFBBL1077 FH71625, NFBBL1077 FH71825, NFBBL1125 NFBBL1115, NFBBL1165 NFBBL1180a, NFBBL1180b NFBBL335, NFBBL1180b NFBBL369, NFBBL1235 NFBBL1024a, NFBBL1235 NFBBL1155, NFBBL1140 NFBBL1120, NFBBL1150 NFBBL1140, NFBBL03L002 NFBBL03L001, NFBBLWSV590 NFBBL1400, SRBBL479 SRBBL0470, SRBBL03L228 SRBBL03L214, SRBBL03L228 SRBBL03L223, SRBBL03L235 SRBBL03L035a, SRBBL03L235 SRBBL03L235 | S | | PAP. 4.4 |
| High float (27) UIDs FABBL3395 (117d), FHBL6486 (63d), FHBL6487 (63d), FHBL6488 (63d), NFBBL01655a (66d), NFBBL0165Ca (66d), NFBBL0165Da (66d), NFBBL0166 (66d), NFBBL0345B50a (66d), NFBBL0370FB (74d), NFBBL0401 (66d), NFBBL0403 (66d), NFBBL0411 (66d), NFBBL1100 (66d), NFBBL1150 (66d), NFBBL1200a (66d), NFBBL153 (127d), NFBBL1970D (66d), NFBBL3196 (137d), NFBBL03L001 (31d), NFBBL03L002 (63d), NFBBL03L002 (63d), NFBBL03L000 (264d), NFBBL03C005 (264d), SRBBL6029 (212d), SRBBL6050 (212d), SRBBL03L008 (157d) | S | | PAP. 4.6 |
| Negative float (450) UIDs AHBL22152 (-22d), AHBL22197 (-103d), AHBL22195 (-36d), AHBL22202 (-17d), AHBL22210a (-35d), AHBL22231 (-13d), AHBL22254 (-86d), AHBL22239 (-47d), AHBL22246 (-36d), AHBL22250 (-49d), AHBL22251 (-87d), AHBL22255 (-97d), AHBL22258 (-97d), AHBL22261 (-197d), AHBL22263 (-167d), AHBL22266 (-197d), AHBL22267 (-198d), AHBL22289 (-175d), AHBL22271 (-162d), AHBL22274 (-175d), AHBL22277 (-227d), AHBL22279 (-197d), AHBL22282 (-237d), AHBL22286 (-217d), AHBL22287 (-175d), AHBL22289 (-227d), AHBL22294 (-97d), AHBL22295 (-97d), AHBL22297 (-156d), AHBL22298 (-156d), AHBL22300 (-237d), AHBL22301 (-237d), AHBL22302 (-237d), AHBL22424b (-245d), AHBL6200a (-141d), AHBL6300a (-212d), CAMBL0350 (-39d), CAMBL0361 (-116d), CAMBL0400 (-116d), DEMOBL1350 (-308d), DEMOBL1400 (-263d), DEMOBL1450 (-308d), DEMOBL1500 (-308d), DEMOBL1550 (-308d), DEMOBL1600 (-308d), FH70115 (-161d), FH70120 (-161d), DEMOBL1650 (-308d), DEMOBL1700 (-308d), DEMOBL1750 (-308d), DEMOBL1800 (-308d), DEMOBL1850 (-308d), DEMOBL1900 (-308d), DEMOBL1950 (-308d) | | | |

- Those items with an “S” for schedule in the DQI report help you see the magnitude as well as which activities to look at to identify impact for items that are flagged.
- Use with lowest level and select the summary element.
- Use in conjunction with the Schedule Health Assessment Report

The DQI report helps provide “S” flagged items and displays with the unique identifier and the impact. For example – there is a section for High Float you saw in the schedule assessment report. Here they are listed by activity and how many days of float each have. You can look at these on the Gantt to see where and how they impact. Also note the list of activities with negative float.



Schedule Health Charts



- There is a chart to show what constraints are on the schedule. This chart is under the Schedule Analysis part of the chart menu.
- The other charts under Schedule Analysis will be discussed later.

23

There is a pie chart in Empower to let the user quickly see the types and number of constraints in a schedule. This is part of data quality. There are many other charts for schedule, but these will be discussed later as part of performance, rather than schedule health / data quality.

Adding IMS to Sort View

Encore Analytics

Dataset | Layout | Clear | Lowest | Sum | Group | Chart | Zoom | eNotebook | Pin | Children | Drill | Filter | Scale | TRB | Links | Critical | Milestone | Detail

832 - Sample Preparation Laboratory (SPL) DEC 23 WBS Dollars :: D-003 DOE Schedule Health :: S-010 DOE Default (G)

| LINK | HIER | Activity ID | Name | Start | Finish | Duration | % Cmp | BL Start | BL Finish | BL Duration | BL % Cmp | Actual Start | Actual Finish | Total Float | Slip | CP | RYG | Predecessors | Successors |
|----------|---------|-------------|---------------------|------------|------------|----------|-------|------------|------------|-------------|----------|--------------|---------------|-------------|------|----|-----|--------------------------------|-------------------------------|
| C.2.20.1 | 111161A | SFP-381.15 | RFI-389 Commissi | 2024-04-15 | 2024-04-16 | 3d | 0 | 2024-01-23 | 2024-01-24 | 3d | 0 | | | 0d | 0d | T | G | CxA-1010.2;FS;SFP-381.14;FS;SF | CLO-1020;FS |
| C.2.20.1 | 1111681 | CxA-1010.2 | Startup Tes ting C | 2024-04-01 | 2024-04-11 | 10d | 0 | 2024-01-09 | 2024-01-22 | 10d | 0 | | | 0d | 0d | T | G | CxA-1010.1;FS;ELC-1920;FS | SFP-381.15;FS;SPL9497;FS |
| C.2.20.1 | 1111682 | CLO-1020 | Pre-Punchlist Insp | 2024-04-17 | 2024-04-25 | 8d | 0 | 2024-02-15 | 2024-02-27 | 8d | 0 | | | 0d | 0d | T | G | A1960;FS;ACH-1190.01;FS;ACH-1 | CLO-1030;FS |
| C.2.20.1 | 1111682 | CLO-1030 | Pre-Punchlist Corr | 2024-04-29 | 2024-05-14 | 13d | 0 | 2024-02-27 | 2024-03-14 | 13d | 0 | | | 0d | 0d | T | G | ACH-L1-1010;FS;ACH-L1-1080;FS | CLO-1110;FS |
| C.2.20.1 | 1111682 | CLO-1040 | Final Punchlist Ins | 2024-05-15 | 2024-05-16 | 3d | 0 | 2024-03-14 | 2024-03-19 | 3d | 0 | | | 0d | 0d | T | G | ACH-L2-1180;FS;CLO-1110;FS;SF | CLO-1050;FS;SPL9577;FS;SPL958 |
| C.2.20.1 | 1111682 | CLO-1050 | Final Punchlist Co | 2024-05-20 | 2024-06-06 | 14d | 0 | 2024-03-19 | 2024-04-08 | 14d | 0 | | | 0d | 0d | T | G | CLO-1040;FS | CLO-1060;FS;CLO-1070;FS |
| C.2.20.1 | 1111682 | CLO-1110 | Complete - 95% C | 2024-05-14 | 2024-05-14 | 0d | 0 | 2024-03-14 | 2024-03-14 | 0d | | | | | | | | | |

Task Detail Report

832 2023-12-17 [CxA-1010.2 : Startup Tes ting Commissioning (Hot Cell Gallery)]

Task Detail

| General Information | | | | | |
|---------------------|--------------------|--------------|-------------|--------------------------|-------|
| Item | Value | Item | Value | Item | Value |
| Unique ID | CxA-1010.2 | Summary Task | F | IMP | |
| WBS | C.2.20.10.40.90.10 | Milestone | F | SubType | |
| OBS | | BCWS | 0.00000 | PlanLineCode | A |
| CA | C.2.20.10.40.90 | BCWP | 0.00000 | HDV | N |
| WP | C.2.20.10.40.90.10 | ACWP | 0.00000 | Baseline Only | No |
| EVM | PCT | BAC | 97556.00000 | Forecast Only | No |
| Contract Milestone | | EAC | 0.00000 | Resource Mitigation Task | |

| Item | Baseline | Forecast |
|--------------|------------|------------|
| Start | 2024-01-09 | 2024-04-01 |
| Finish | 2024-01-22 | 2024-04-11 |
| Early Start | | 2024-04-01 |
| Early Finish | | 2024-04-11 |
| Late Start | | 2024-04-01 |

- Can filter on activities
- Task detail report provides information on the task selected in the sort view

Here filtered for incomplete tasks baselined to start within the next 3 months that are on the critical path