FPEP Enterprise

TECHNICAL PAPER

Using Remaining Duration to Assess the Critical Path

A practical review of updated programmes

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Evidence connected.
Programme context preserved.
Professional judgement retained.

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What controls completion in an updated programme

Remaining duration is the estimated working time required to complete an activity. Whether it controls completion depends on its position in the remaining network and the conditions governing its successors. Remaining duration is the entry point to a broader validation of the remaining network, illustrated here for planners, project managers and delay analysts.

Executive position

A defensible critical-path assessment combines verified progress, credible remaining-duration estimates, valid dependencies, appropriate calendars and a defined completion milestone. Trace the driving sequence and test whether plausible changes alter it or the forecast. Ranking or adding unfinished activity durations cannot establish control. Software-generated critical colouring is an analytical indicator requiring validation, rather than conclusive proof.

The principal use is prospective: identifying the current controlling path and opportunities for intervention. Successive assessments can also inform a retrospective investigation, provided the analyst preserves what was known at each date and tests it against contemporaneous records.

Three different measures

Activity remaining duration is the estimated working time needed to finish an activity. Oracle defines the P6 field by reference to the activity's remaining start, remaining finish, and assigned calendar; it is zero once complete.[1] The reported remaining duration is an estimate, not a fact. Test it against the work remaining, access constraints, available resources and achievable productivity.

Remaining path duration describes the time required by a connected sequence of unfinished work. Simple addition is valid only where the sequence consists of serial finish-to-start relationships, uses compatible calendars, and contains no intervening waits. Overlap, lag, release dates and resource restrictions require a date-based calculation.

Remaining time to completion is the interval between the assessment date and the forecast milestone. It may include waiting and non-working time as well as activity execution. It is not the sum of all remaining activity durations.

Record whether each duration was estimated at the assessment date, carried forward or revised later. Identify later knowledge in retrospective reconstructions so that corrections are not presented as contemporaneous evidence.

[1] Oracle, P6 Help, Data Dictionary, Remaining Duration Activities.

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Working definition

The term “remaining-duration programme analysis” is used here to describe a structured review of the uncompleted portion of an updated programme. The process validates remaining-duration estimates, traces driving relationships and assesses competing paths to a selected milestone.

Terminology

“Driving path” means the relationship chain governing completion under the stated model. P6’s “Longest Path” is intended to identify the driving sequence to the project end date under the current schedule model and settings. Constraints and resource levelling can break its continuity. “Critical” may instead denote a float-threshold flag. Multiple-float-path analysis can examine a chosen endpoint. Validate these outputs against calendars, resource treatment and execution conditions.[2,3]

Establishing a reliable remaining network

Define the question and preserve the source

Identify the milestone under examination, the programme revision, its data date and the purpose of the analysis. Overall completion, sectional handover and an access milestone can have different controlling paths. Preserve the received native file and its scheduling settings, then work on a separately identified copy. Record the software version, calendars, external links, constraints, resource-levelling status and treatment of out-of-sequence progress.

Reproduce the result reported by the received programme before making corrections. If recalculation changes the reported dates, explain why. Separate corrections to defective data from changes in forecasting assumptions and from proposed mitigation. Otherwise, a reviewer cannot determine which alteration caused the result to move.

Validate progress and estimate the work left

Check actual starts, actual finishes and status against records at the data date. Investigate future-dated actuals, unfinished activities whose forecast dates remain in the past, missing relationships, unconnected completion milestones and completed activities with residual work. Preserve completed history wherever possible; indiscriminate removal of completed activities can destroy the network context needed to understand the remaining sequence.

[2] Oracle, P6 Help, About Critical Path Activities.
[3] Oracle, P6 Help, Working with Critical Activities.

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For significant unfinished activities, record the residual quantity or deliverable, achievable production rate, available crews, working calendar and outstanding prerequisites. Dividing the residual quantity by an achievable production rate may provide a starting estimate, but allowances for mobilisation, inspections, rework and acceptance must be explicit. Avoid counting the same allowance both in an activity duration and in a separate successor.

Physical progress is not necessarily proportional to elapsed time. Installation may be 90 per cent complete by quantity while testing and acceptance still require substantial time. Elapsed duration alone does not establish completed work.

Calculate and trace the driving sequence

Recalculate the updated network using documented settings. Trace backwards from the chosen milestone through the relationships that govern its forecast date. At each junction, identify why one predecessor controls and how close the alternatives are. Use total float as supporting information and state the reference finish date and calculation basis.

Oracle's multiple-float-path facilities support analysis towards a selected endpoint. Inspect the actual chain rather than treating the critical flag as the conclusion.[2,3] Equal driving paths can converge on the same milestone: delaying either may delay completion, while accelerating only one may yield no benefit. Near-critical paths retain some flexibility; shared-resource restrictions may create further controls requiring explicit modelling.

Challenge the result before reporting it

Test credible alternatives for uncertain durations, access dates and sequencing. Check whether a modest extension on a competing path changes the controlling path. On a zero-lag finish-to-start chain with a common calendar, extending a driving activity should delay the milestone by the same working time unless another model feature intervenes. In more complex networks, test the governing start or finish relationship directly. Record the reason for any unexpected response. This workflow applies the GAO principles of valid logic, a credible critical path, reasonable float and properly updated schedules.[4]

[4] US Government Accountability Office, Schedule Assessment Guide, GAO-16-89G, December 2015. See Best Practices 6, 7 and 9.

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A construction example of remaining criticality

Consider a building approaching handover. A switchboard delivery is late against the procurement plan. At the assessment date, delivery is forecast in eight working days; installation cannot start until it arrives. Integrated testing then waits for both equipment installation and the services installation. Documentation has ten days remaining but can proceed independently.

This is a hypothetical construction illustration using the network below. Assume a single common calendar, with durations expressed in working days, zero-lag finish-to-start links, no resource restrictions and no imposed finish constraints. The assessment date is working-time coordinate 0. H is a zero-duration completion milestone; all durations are remaining working days.

ID	Remaining activity	Days	Predecessor	Early finish
A	Release work area	4	None	4
B	Equipment delivery	8	None	8
C	Install services	6	A	10
D	Install equipment	3	B	11
E	Integrated testing	2	C and D	13
F	Complete documentation	10	None	10
H	Completion milestone	0	E and F	13

Table 1 Remaining network at working-time coordinate 0

The services path A–C–E–H requires 4 + 6 + 2 = 12 days. The equipment path B–D–E–H requires 8 + 3 + 2 = 13. Documentation F–H requires 10. Testing starts at day 11 after both installations finish; handover follows at day 13. Documentation is the longest individual activity yet has three days of float. A and C have one day; B, D and E have zero.

What the planner would investigate

Check the supplier's dispatch commitment against delivery records and correspondence, confirm that the installation crew and lifting arrangements will be available, and establish the testing and witness requirements. The eight-day delivery forecast and three-day installation allowance need evidence; a supplier's unconfirmed promise is not equivalent to an achievable programme.

Confirm also that the documentation can genuinely proceed in parallel. If final test results are needed to close the handover dossier, model that dependency instead of retaining the simplifying assumption. The construction sequence, not the apparent size of the documentation task, determines the result.

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Suppose the supplier proposes an earlier dispatch, but the required lifting slot cannot be advanced. The nominal delivery saving may then have no effect on installation. The planner should check transport, access and resource commitments together, record the accepted assumptions and rerun the programme before reporting a recovery benefit. This is an execution check, not simply an adjustment to the delivery duration.

The two sensitivity cases in Figure 2 are tested independently. Extending C by two days delays handover by one day. Expediting B by two days also improves completion by only one day, because the services path then becomes controlling.

Seeing the controlling path

The diagrams retain Table 1's assumptions. The network is schematic; the bars compare path-duration totals, rather than showing an executable activity Gantt chart.

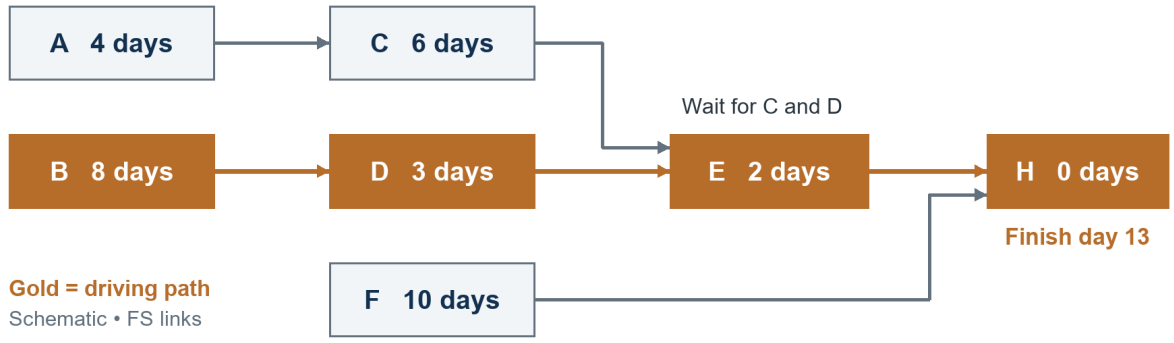


Figure 1 Remaining network at working-time coordinate 0. Gold arrows identify the current controlling path, B-D-E-H, which forecasts completion at day 13. E requires both C and D; H requires both E and F. Node values show remaining working days.

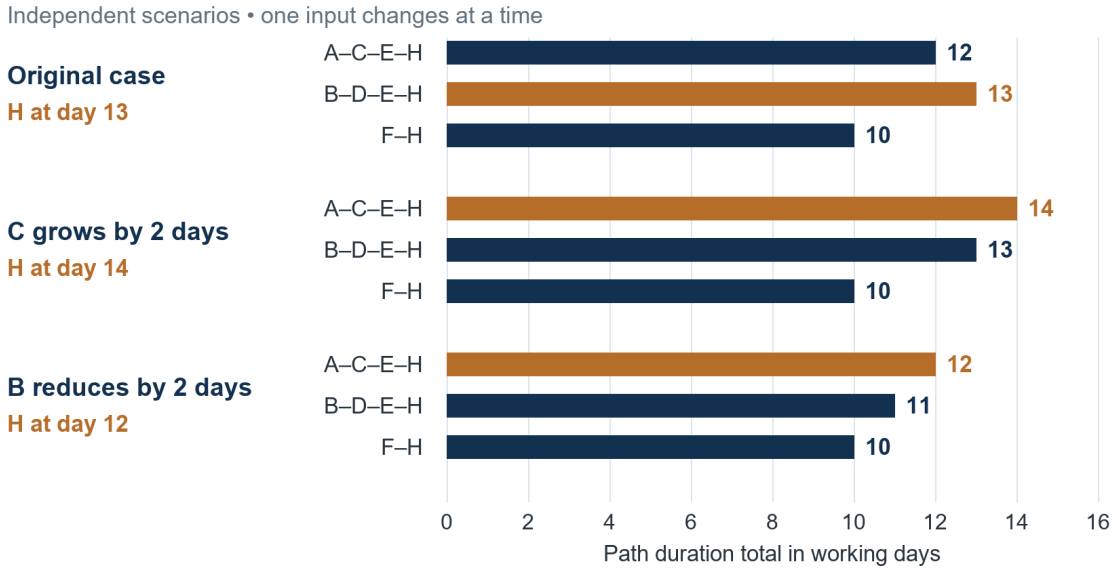


Figure 2 Base case and two independent sensitivity calculations at working-time coordinate 0. Each sensitivity case changes one input from the base case. Gold marks the longest path. Shared activity E is included in both A–C–E–H and B–D–E–H, although the work occurs only once.

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At working-time coordinate 5, A is complete, while D and E have not started. Retain the original logic and use contemporaneous records to substantiate any revised remaining-duration estimates:

1. B, C and F each have five days remaining: equipment controls, requiring ten more days; H moves to day 15.

2. C instead has nine days remaining: services control, requiring eleven more days; H moves to day 16.

The previous critical-path label is not a permanent characteristic of an activity or its work package.

Reading the completion forecast across updates

For a consistent milestone and working-time scale, the forecast finish coordinate equals the assessment date plus the remaining interval. Let t be the assessment date, R the remaining interval and F the forecast finish coordinate.

Then $F = t + R$, and $\Delta F = \Delta t + \Delta R$. This identity concerns the interval to completion, not the sum of individual activity durations.

In this separate hypothetical example, R starts at 20 days and is reassessed five working days later. Calendar, scope and milestone are unchanged. Lines join two assessment points; they do not imply daily observations.

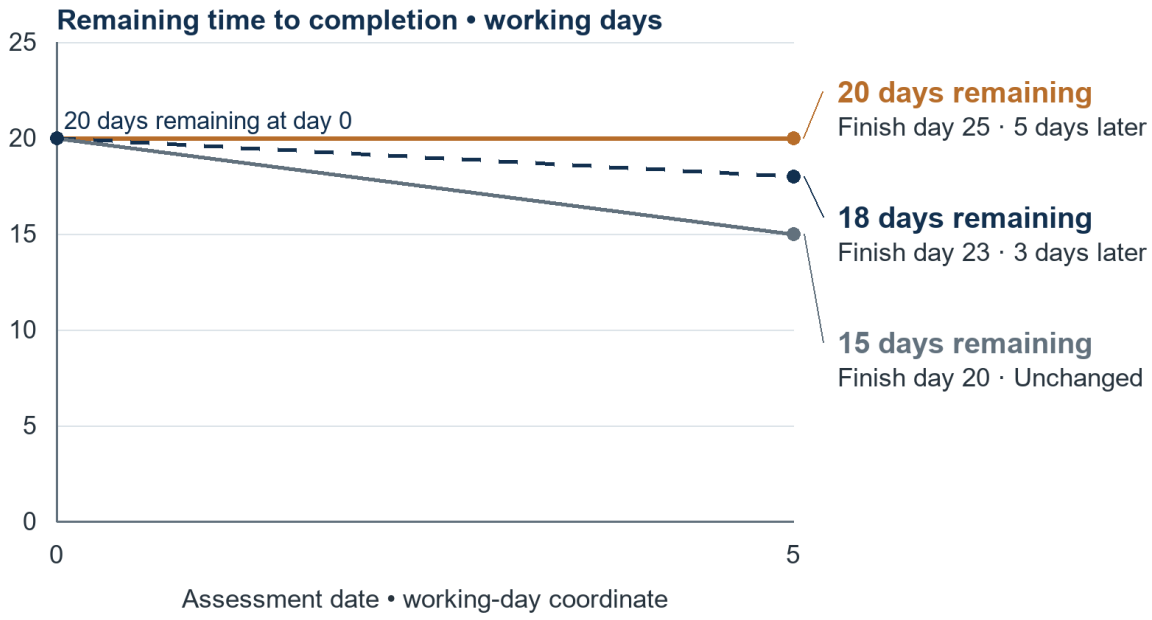


Figure 3 Remaining time to completion at two assessment dates. The unchanged-forecast case falls from 20 to 15. A slower fall to 18 still means a three-day deterioration in forecast completion. If the remaining interval stays flat while five working days elapse, the forecast completion moves five working days later.

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Check the arithmetic

If R falls to 15, F = 5 + 15 = 20: the forecast is unchanged. If R falls only to 18, F = 23: completion is three days later. If R stays at 20, F = 25: the forecast completion moves five working days later. Do not mix elapsed calendar days with durations on different working calendars.

Investigate the movement

Use stable activity identifiers and map splits, mergers and new scope explicitly. Reconcile progress separately from duration re-estimates, logic revisions and calendar changes. A falling duration may reflect progress, optimistic re-estimation or a scope change. Test uncertain assumptions in controlled copies; their effects may interact rather than add together.

FPEP comparisons and associated records can help investigate these changes. Figure 3 is an analytical illustration, not a demonstrated E1 TRACE report output. The trend indicates forecast movement; the network trace and evidence establish which work controls and why.

Conditions that can mislead the analysis

Constraints and calendar effects

An imposed target can produce negative float without changing the sequence that drives the unconstrained forecast. Conversely, an external release date can genuinely control when work proceeds. Distinguish contractual targets, modelling constraints and physical prerequisites. If needed, test the imposed target in a controlled copy, retaining the original and explaining the diagnostic purpose.

Calendar differences can make equal remaining durations end on different dates. Record working hours, holidays, shifts and the calendar used for relationship lag. Do not rank mixed-calendar paths by adding their displayed day values. Oracle also notes that constraints, resource levelling and interproject scheduling can affect the continuity or membership of a reported longest path.[2]

Out-of-sequence progress and overlapping work

When work starts out of sequence, establish whether its remainder still requires the predecessor or has been validly released in part. Preserve actual progress and resolve the residual dependency from records.

Oracle's scheduling options distinguish retained logic, progress override and actual-date treatment for progressed work.[5] The choice can change the remaining dates. It should represent the supported execution sequence, not be selected because it yields a preferred completion date. Record any logic correction and compare material alternatives where the evidence is uncertain.

[5] Oracle Primavera Cloud Help, Schedule a Project. This is Cloud documentation; confirm equivalent options in the installed P6 version before applying.

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Start-to-start and finish-to-finish relationships need particular care. Extending a predecessor's duration may not affect a successor driven only by its start. A duration-only test can then miss a controlling start condition. Trace the specific relationship and identify any missing finish dependency or unmodelled completion requirement.

Resources and uncertain forecasts

A logically connected programme can still be unachievable if concurrent activities rely on the same unavailable crew, crane or specialist. A longest path calculated without resource restrictions may differ from the controlling sequence in a resource-constrained execution plan. Represent restrictions through logic, resource levelling or another documented mechanism, and check the forecast against the executable sequence.

Remaining durations are estimates. A single deterministic path describes the selected assumptions; it is not a probability statement. Review paths close enough to become controlling under plausible variation. Where the decision warrants probabilistic analysis, account for shared risks and duration dependence rather than assume each activity varies independently.

Limits in retrospective delay analysis

An update is a dated forecast, not an as-built account. Distinguish any reconstruction using later knowledge from the contemporaneous view. Verify historical control against actual sequencing, access, instructions, production and completion records.

Analytical limitations

A forecast movement identifies a programme effect under stated assumptions. It does not, by itself, establish causation, contractual responsibility, concurrency or entitlement.

Assess those questions against the event-specific facts and contract, stating the model’s evidential limits.

How E1 TRACE supports the analysis

E1 TRACE by FPEP Enterprise supports comparisons, evidence review and reporting; critical-path validation requires recalculation in the source scheduler. The workflow below reflects Version 1.0 R73 RC7 code and documentation reviewed on 7 October 2026, not a live-project acceptance test.[6]

[6] E1 TRACE by FPEP Enterprise, Version 1.0 R73 RC7 local release package. Capability evidence: R72 identity release note (3 October 2026); app/gantt_report_generator_v47_1.py, load activities and generate programme comparison; app/programme_evidence_linker.py, build suggestions and decide; app/dcma_14_point_report.py, assess revision and _longest remaining path. Code and documentation reviewed 7 October 2026; no live-project operational validation claimed.

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Compare updates and identify the work to review

Select the relevant programme revisions and data dates. Programme Comparison highlights activity additions and deletions, forecast-date movement, float and recorded criticality changes; it also reports relationship and other changes where imported data supports them. Use these differences to identify unfinished work requiring investigation.

Activity exports include remaining duration. Compare that field explicitly across revisions: the general Duration comparison uses original duration where available, so its variance is not necessarily a remaining-duration change. A dedicated remaining-duration trend should therefore be prepared from the relevant activity records.

Check the programme and link the supporting records

Programme-quality diagnostics flag missing logic, long remaining durations, float exceptions and other data issues. These checks help prioritise review before accepting the forecast. They do not correct the network or establish the driving path.

The programme/evidence linker suggests records using activity references and matching terms. Users approve or reject suggestions; accepted links retain the programme revision, activity, reviewer and supporting context. Use these links to test delivery dates, quantities, access and production assumptions against the underlying records, rather than treating a match as proof.

Apply the workflow to the switchboard example

Compare the delivery, installation and testing activities between updates. Review the supplier correspondence, delivery records, lifting arrangements and testing requirements against B's eight-day and D's three-day allowances. Link the relevant records and record unresolved assumptions. Check that documentation F can proceed independently.

Test the proposed two-day delivery saving in the originating scheduling software. Under the example's assumptions, completion improves by only one day because the services path then controls. Use E1 TRACE's comparisons and linked evidence to explain that result and its practical conditions.

Scope and limitations

The reviewed build requires source-network recalculation for critical-path validation. Its accumulated duration path diagnostic does not reproduce a full scheduler's treatment of relationship types, lags, calendars, constraints or resource levelling. Treat it as a screening indicator. Evidence links require interpretation and do not themselves establish causation or entitlement.[6]

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Produce a reviewable assessment

Programme Comparison provides graphical summaries and Word, PDF, Excel and CSV outputs. Combine the relevant reports with the validated network result and evidence references. State the selected milestone, data date, controlling path, competing paths and assumptions; distinguish the received update, corrected analysis and mitigation scenario.

Reporting a conclusion that can be tested

The report should allow another analyst to reproduce the result. Identify the source programme and data date, selected milestone, verified progress, revised duration assumptions, scheduling settings, driving chain and competing paths. Link material corrections and assumptions to their evidence. Include the native analysis file, schedule log and a concise register of changes when issuing a project-specific assessment.

A conclusion should state the forecast and its basis together. For the worked example: “At working-time coordinate 0, milestone H is forecast at day 13. B–D–E–H is the driving path under the stated common calendar, finish-to-start assumptions. A–C–E–H has one working day of float. Increasing C by two days changes the controlling path and moves H to day 14.” This is more informative than “B is critical” because the endpoint, assumptions and sensitivity are visible.

A review record should also state what would change the conclusion: a revised delivery commitment, a newly identified dependency, an unverified actual date or a different calendar. Assign each unresolved assumption an owner and a review date so that the forecast can be updated when better evidence arrives.

Conclusion

Reliable remaining-duration estimates, verified sequencing, and evidence-supported updates allow an analyst to explain which path controls completion, how that path changes, and what limits the available recovery options. E1 TRACE by FPEP Enterprise supports this process by connecting recorded programme movements with the contemporaneous evidence needed to evaluate them.

The critical path is not necessarily the longest individual activity, the activity with the greatest remaining duration, or the sequence identified as critical in an earlier update. It is the path that governs the selected completion milestone under the programme logic, status, calendars, constraints, and evidence available at the assessment date.

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