



White Paper 2015-15

How to Relate Schedule Hierarchy Levels and Work Breakdown Structure

This White Paper completes White Paper [2015-14 'How to Build a Proper Project Schedule Hierarchy'](#) by relating the different schedule levels with the different levels of the Work Breakdown Structure. We intend in particular to highlight the need of a consistency between both structures when designing the finer grained schedule breakdown.

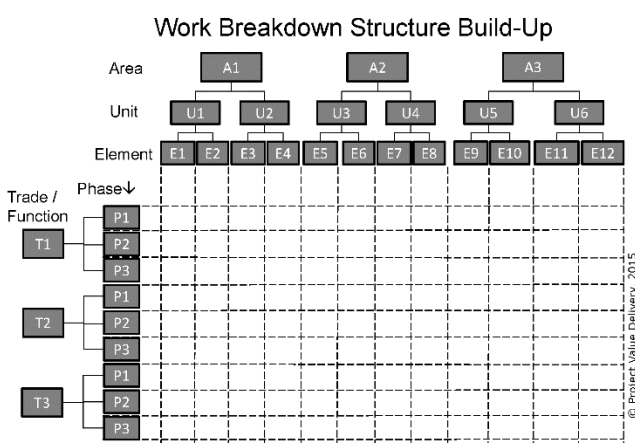
Fundamentals of Work Breakdown Structure (WBS) Build-up

A schedule is nothing but an arrangement of activities in a logic network. The part not to miss out is the arrangement, which shall allow to sort out the scope, ensure nothing is missed out or doubled and everything can be found naturally.

The Work Breakdown Structure (WBS) is the standard control tool for comprehensiveness. A proper WBS allows structuring hierarchically the Project activities in order to assign Budget Owners, and handle the Project in manageable human-size sub-parts. The basis for proper planning is structure, which will also allow to setup the various control tools according to the same approach (progress measurement, material control, responsibilities, etc.). It is too often forgotten.

An effective WBS is a matrix between subjects and objects:

- A subject accounts for a trade, calling on specific knowledge, cycles, deliverables and tasks,
- An object is a physical part of a project.



Practically speaking, subjects are usually organized in two levels:

- Trade (electricity, process, civil, systems, etc.),
- Phase (Milestones, Engineering, Procurement, Construction, Commissioning, etc.).

Objects follow three levels depending of the size of the project:

- Area (plant, storage, utilities, off-site facilities, etc.),
- Unit (platform, process unit, etc.),
- Element (module, building, road, etc.).

The important concept is the matrix organization of physical objects with subjects, which will allow the splitting of tasks and activities in sub-entities of the project. The names for the levels of objects and subjects, and their list may of course be customized for each project.

It is extremely important to allow this structure to be built at the start of the Project and followed thereafter for evolutions. It is central to the proper organization of activities and processes,

avoiding the threats of having too low or too much detail. When it comes to schedule, this structure will drive how the planning is built, and how the different schedule levels are articulated. It has also a significant influence in the organization of physical progress measurement.

Producing a Schedule Hierarchy Consistent with WBS levels

For levels 0 through 3, a rule of definition is that the level of the schedule is representative of the same number of WBS levels plus one, and an additional level of detail for the represented tasks:

Level (Schedule) + 1 = Level (WBS)

- The Level 1 is either by Phase and Area or by Phase and Trade,
- The level 2 is either Phase / Area / Unit or Phase / Trade / Area,
- The level 3 is commonly by Phase / Trade / Area / Unit.

The levels 4 and 5 are more specific as they are only representative of a subsection of the entire Project, as a detail of the level 3. Level 4 generally represent the cut-out of one trade covering all areas, units and elements for a particular phase. Level 5 schedules will consider finer detail in terms of areas and units.

Limiting the size of the level 3 schedule

If we want to keep the level 3 schedule within a limit of 2,000 to 3,000 activities, the number of activities per Phase/ Trade/ Area/ Unit needs to be limited drastically.

In a typical project there might be 3 phases, 5 trades, 20 areas/units. Then for each, only 5 activities are allowed on average. This shows the importance of more detailed level 4 and 5 schedules for driving the work of each trade.

One of the important and under-used tools are the cycles or fragnet, which are simply a stand-alone detailed schedule (level 4) of a repetitive task. It allows to set the logic and parameters of a sequence once, and then represent it simply at level 3 as a single task, with a duration proportional to its representative quantity. For example, cable laying is a sequence which detailing (cable tray installation, supporting, cable drums preparation, cable pulling, terminations) is of paramount importance and need to be detailed as a fragnet by a construction manager, to work with his subcontractors. Then it can be reduced at its simplest expression in a level 3 schedule: cable pulling of Unit A12, 10.112 linear meters, 26 days.

For levels 0 through 3, a rule of definition is that the level of the schedule is representative of the same number of WBS levels plus one, and an additional level of detail for the represented tasks:

Level (Schedule) + 1 = Level (WBS)

Conclusion

Notwithstanding the formal constraints on schedule hierarchy it is always possible to create a meaningful set of schedules. A key driver is to be consistent with the WBS when building that hierarchy, and keep the level 3 Integrated Project Schedule within a reasonable level of detail.

Find all these principles of Advanced Scheduling exposed in a comprehensive manner in our Handbook, Advanced Project Scheduling for Project Managers (2nd edition available in [Paperback](#) and [Kindle](#) versions!)



[all links to Amazon.com]



We Empower Organizations to be Reliably Successful in
Executing Large, Complex projects.

Discover more on
www.ProjectValueDelivery.com