



White Paper 2019-04

How Implementing and Owning a Strong Master Schedule is Essential for Owners

In our work for Owners driving large, complex projects we too often identify processes that have not the resilience and consistency that would be required. This may be due to several factors and dramatically impacts the success rate of the project. In this White Paper we investigate Schedule Management, in more detail with a specific focus on the overall Master Project Schedule. We describe possible reasons for oversight, consequences on the project and ways to implement a proper approach.

Applicability

This White Paper is applicable to Owners driving large, complex projects involving several Contractors and scopes. Even if a single EPC Contractor is contractor for most of the scope, a strong overall schedule management is generally still required when considering the full scope of the project from the Owner perspective, because of the following interfaces with activities from other parties:

- Works on existing Owner facilities and on third-party facilities,
- Manufacturing of Long Lead Items, or design and manufacturing of specific licensed parts of the facility,
- Preparedness activities of the future Operator and operating organisation,
- Activities required by regulatory processes and government agency relations
- Activities required by financing bodies

Therefore, for most projects, the Master Schedule needs to be properly managed at Owner level. The issue is more acute when several Contractors are involved on separate sections of the scope, because interfaces between the various Contractors' schedules multiply.

Consequences of lack of Master Schedule Management

When Owners do not maintain a properly developed, technically sound Master Schedule that reflects the full scope of the project (including those activities directly or indirectly under Owner responsibility), consequences on the overall project schedule (and hence cost) can be dire. The following symptoms appear:

- The critical path of the project is not clearly identified – different project contributors may have different opinions on the matter. This leads to inadequate prioritisation of effort, ineffective team discussions and unrealistic schedule expectations, and contributors performing work urgently which is then not needed for long time,
- Convergence points of deliverables between contributors are not identified clearly and anticipated, leading to substantial inefficiencies in the

form of Contractor / contributor workforce standby, loss of seasonal or facility slot, etc.

- Surprise discovery late in the project of the oversight of critical activities that actually drive the project schedule outcome and operability of the facility (e.g. feedstock finer characterisation, process details, preparedness for operation and maintenance etc.).

As can be inferred from those symptoms, lacking an overall view of the project schedule covering

the entire scope can have dramatic consequences for the project and for the Owner. Not maintaining a Master Schedule and trying to drive the project is akin to driving by night without lights and map – disaster awaits soon. How can a project be properly driven without a Master Schedule?

Objectives of Master Schedule Management

Having a proper overview of the overall project schedule allows to:

- understand what is driving the project and allocate resources on those critical activities, and protect (buffer) the critical chain by proper scheduling of non-critical activities,
- anticipate convergence points to minimise inefficiencies,
- properly control the project and initiate the timely start of the required activities to ensure its success.

To achieve this, the Master Schedule maintained by the Owner needs to be comprehensive and focus on the interfaces between contributors.

Reasons for Oversight

We often find that the schedules maintained by Owners are incomplete (they do not cover in a comprehensive manner all activities required for the project successful delivery), inaccurate, technically unsound or too complicated. This is often due to the following root causes:

- the Owner relies solely on the schedules provided by its Contractor(s) which do not include activities by Owner or third parties, although these activities may often be critical for the overall project (e.g. licensing, financing or operational preparedness),

Master Schedule management is indispensable – why is it too often overlooked by Owners?

- the Owner's Master Schedule is a compilation of the Contractors' schedules with the addition of some Owner activities. The schedules produced and maintained in that way are often excessively complicated (too many activities), tend to become inaccurate, and lack proper linkages between Contractors' and Owner's activities,
- The Owner's Master Schedule that was produced at the end of the definition phase for the purpose of authorising the project is not updated during execution, while the team focused on Contractors' schedules.
- Lack of attention to or capability to develop a technically sound schedule that clearly shows the critical path and impacts of changes to duration or sequence of tasks

When Owners do not maintain a properly developed, technically sound Master Schedule that reflects the full scope of the project, consequences can be dire.

We find surprisingly frequently instances where no Master Schedule is maintained at all. Excuses range from the lack of resources, associate workload and inability to produce and maintain such schedule.

Format of the Master Schedule maintained by the Owner

An important point is that the Master Schedule to be maintained by the Owner responds to specific Owner needs and therefore, requires a specific development. It needs to be developed early during the definition phase and updated regularly as progress information flows in from contributors and Contractors during the course of the project.

Development of the Master Schedule at the right level of detail to ensure its accuracy and usefulness is an intellectual effort which requires a seasoned scheduling lead.

The Owner's overall schedule does not need to be huge in terms of size and number of activities. It needs to cover the entire scope required for the delivery of the project, identify clearly what is the critical chain and focus on interface points between contributors and Contractors.

It can be in a traditional schedule format, although we often prefer the Convergence Plan format (refer to our White Papers [2012-04 'Convergence Management: the Key to Large, Complex Projects Success'](#) and [2015-17 'How to Produce and Update a Convergence Plan'](#)).

Large parts of contributors and Contractors' activities can be heavily summarised as long as they don't interface with other scopes.

A relatively simple Master Project Schedule is also a great asset for the project team when communicating with the Project Governance as it can be readily understood and read by Senior Management.

The Owner's overall schedule then needs to be updated as soon as new progress and associated schedule forecast information is available. This generally gets done on a monthly basis for large complex projects, consistently with the update frequency required from all contributors and Contractors for their master schedules. This activity needs to be performed in addition to the review and challenge of the schedules provided by contributors and Contractors. However, if the Master Schedule is not complicated, this update activity does not require additional resources.

Case for strong Master Schedule Management by the Owner

Master Schedule Management is essential, and only the Owner can have a comprehensive view of all aspects of the project. Therefore, we strongly recommend that developing and updating the Master Schedule be performed by the Owner team. This recommendation is also supported by the fact that developing and owning the schedule is a great benefit to understand the project as it unfolds; in addition, a properly developed Master Schedule as per our recommendations does not require much resources to update and will therefore not greatly impact the resources needed at Owner level.

Conclusion

Maintaining an accurate Master Project Schedule covering the full project scope in a comprehensive manner is indispensable for the Owner. It cannot be delegated. It is necessary to understand where lies the critical chain and where focus should be applied. Applying the right format for the Master Schedule allows to perform this activity in a fluid manner without great expenditure of resources and bringing great benefits to the team and its governance. Master Schedule management is indispensable – why is it too often overlooked by Owners?



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