

AACE International Recommended Practice No. 23R-02

**IDENTIFICATION OF ACTIVITIES**  
TCM Framework: 7.2 – Schedule Planning and Development

Acknowledgments: (May 3, 2007 Revision)

Lee J. Hobb, (Author)  
Ronald M. Winter, PSP  
Timothy T. Calvey, PE PSP  
Edward E. Douglas, III CCC PSP  
Earl T. Glenwright, Jr. PE PSP  
James G. Zack, Jr.

Acknowledgments: (March 26, 2004 Revision)

Jennifer Bates, CCE  
Steven G. J. Boeschoten  
Larry R. Dysert, CCC  
H. Ernest Hani  
H. Christian Heller  
John K. Hollmann, PE CCE  
Katrina D. Knight  
Philip D. Larson, CCE  
Wesley R. Querns, CCE  
Dr. Randy R. Rapp, PE CCE  
Richard A. Selg CCE  
Kul B. Uppal, PE

## **PURPOSE**

This recommended practice for identification of activities is intended to provide a guideline, not establish a standard. This guideline covers a key step in the schedule planning process of the total cost management (TCM) schedule planning and development process <sup>[1]</sup>.

This recommended practice is for use by the project team members involved in the schedule planning process for any project type and in any industry. Many individuals contribute in the identification of activities, and having an experienced planner coordinate the process improves final quality and adds value to the planning process.

As a recommended practice of AACE International, identification of activities in schedule planning and development provides guidelines for the conversion of scope definition to specific activities and tasks required to complete a program or project. Identification of activities is a key planning step that takes place early in the schedule planning and development process which also includes estimating durations, determining and defining resources, and identifying external project constraints.

The scope definition of a program or project is generally described in various planning and technical documents, databases, or other deliverables. To begin the planning process, information in the scope documents must first be translated into manageable activities. For example, the scope may include the installation of a length of pipeline. Installing that pipeline may require designing, procuring, cutting, welding, erecting, and inspection activities. This process of expanding the high level scope or functional definition into the detailed work required for completion is the practice of “identification of activities”.

## **RECOMMENDED PRACTICE**

The recommended practice for the identification of activities and schedule planning in general is to involve all the key team members under the leadership of the project manager with support from the planner/scheduler. For example, on a construction project, key team members might include the construction manager, engineering manager, quality assurance manager, safety representative, estimator, procurement representative and of course the planner/scheduler. For contractor schedules, an owner representative should attend the planning sessions when appropriate. Likewise, appropriate government agency representatives, key vendors and equipment suppliers, should participate as needed.

A team meeting and/or workshop are excellent forums to identify activities for the project schedule. Prior to the meeting, all scope documents and other supporting documents should be provided to the participants for review. Scope documents and supporting information may include the following:

- Statement of work
- Functional requirements
- Project concept documentation (including all appropriate contract drawings and technical specifications)
- Work breakdown structure (WBS)
- Significant project milestones and constraints
- Project estimate (including preliminary schedule of values)
- Risk analysis information including appropriate regulatory considerations that may affect the schedule
- Project procurement/contracting plan (long lead items)
- Lessons learned from previously completed similar projects

The work breakdown structure (WBS) is a work categorization tool used for planning, managing, executing and reporting for the project. Therefore, the WBS should be a major reference source during the planning process, especially for identifying activities. Each activity must have only one WBS designation.

For short duration or complex projects, it is good practice to identify and include in the planning process and workshops as appropriate, the specific project team member who will be responsible for the execution of each activity and will be accountable for its completion. This assignment approach may be difficult for long duration projects. Therefore, it is also a recommended practice to fully define and document the activity basis to ensure that the person responsible for its future performance understands the scope of the activity.

An activity is composed of the following essential attributes that are derived from the WBS and supporting sources listed above.

- A unique alpha/numeric identifier. Should be capable of “smart” or “intelligent” activity identification in which unique activity identifiers are systematically organized to relate to various groupings of schedule activities. Such intelligence allows for enhanced sorting and reporting abilities.
- An initial duration work period. This should reflect the intended scope described in the activity title.
- A calendar assignment. A decision should be made whether an activity should be scheduled on a given work calendar. The need for multiple calendars for the project should be reviewed because the use of multiple calendars may affect the float calculation of each activity (e.g., discontinuous float path); the team should be in agreement on the calendar choice.
- A descriptive title of the intended scope of work. It should be clear and succinct without being vague and/or ambiguous.
- The preliminary sequence of logic ties to a predecessor and successor activity in accordance with the project execution plan. It is important that the initial logic reflect a prudent, practical sequence for work performance. Starting with such an initial sequence will facilitate later determination of alternate sequences that can shorten completion time and cost.

The activity description and initial activity duration should unambiguously communicate the scope of the work. This reduces confusion among stakeholders and facilitates logic reviews, activity progress measurement for payment, forecasting and other tasks. Including a deliverable or quantifier in the activity description such as a dimension, quantity or a physical demarcation is generally a good way to communicate the activity scope (percentages are not a good quantifier). The intent of a quantifier is not to duplicate the budgeted quantities that are elsewhere in control tools, but to make the activity scope as self-evident as possible.

Not all activity descriptions are amenable to the use of quantifiers; the following points should be considered:

- 1) This practice usually involves lengths or other dimensional or boundary demarcations, not volumetric quantities,
- 2) Dividing a continuous effort into separate activities based upon a portion of the work is an unusual occurrence,
- 3) In the odd case where a continuous process can only be described using quantities, then quantities are used, and
- 4) When quantities are used, it is never the estimate total, but some fraction of the estimate that is to be measured. The last section of the activity chain using a quantity description is usually, "Remaining Quantity of xxx", so the actual estimate quantity is never included in the activity description (i.e., thus avoiding discrepancies that might arise with design changes).

The following is an example of an ambiguously titled activity using a percentage (“half”):

**“Pave West Half of 5<sup>th</sup> Street”**

The following quantified version provides much more clarity with few extra words:

**“Pave West 40 LF/ 5<sup>th</sup> Street (1320 LF)”**

Activity descriptions should also be consistent with the level of effort and duration required for activity completion. In that regard, static terms such as “begin”; “start”; “end”; “finish”; “complete” or other terms that indicate “point-in-time” events should only be used with activities of zero duration because they are events. The following is an example of an activity that may be substantial in scope, but reads like an event:

**“Begin Base Course – 5<sup>th</sup> Street”**

The following improved version provides much more clarity:

**“Place/Grade 9 Base, Lane 1, 1320 LF/5<sup>th</sup> Street”**

Other schedule design activities attributes may also be included in activity coding as shown in the following (however some project owners now require these attributes be shown by detailing these in the contract scheduling specification):

- Activity code designation for sorting and grouping
- Activity ID coding designation as part of smart numbering system. For example using the Construction Specifications Institute (CSI) code as the initial designator
- Resource assignment code designation as a identification of craft or subcontractors

The additional attribute coding is intended to assist in the sorting and reporting functions. However, the level of complexity of the project may increase due to the added attributes. Therefore it is important to resolve these “schedule design” issues early before beginning the detailed activity planning.

An early decision that should be made by the team during the planning process is determining the level of detail and general number of activities appropriate for managing the project. Short duration, low complexity projects will generally not need the same level of detailed activity identification as long duration complex projects. Some considerations in determining appropriate levels of detail include:

- **Duration of Project** – Shorter duration projects typically require less level of detail than a longer duration project. As a general guideline, activity durations should be approximately the same length as the project’s planned frequency of progress status reporting.
- **Project Complexity** – Complex projects may have short durations, such as maintenance outages measured in hours, but may still require a greater level of detail in activity identification.
- **Execution Methodology** – Projects with a high level of sub-contracting generally require less detail than self-performed projects.
- **Phase of Project** – The level of detail in activity identification should match the type of work being performed, and the information available, for that phase. For instance, during the conceptual phase, start-up may be planned with summary level activities, whereas design engineering may be planned in greater detail.
- **Cost of Project** – Generally, the higher the cost of the project, the greater level of detail in activity identification.
- **Cost and Ability to Adequately Review the Schedule** – The owner of a project should not require the submission of a schedule that is more detailed and complex than the owner is able to properly review. As a required submission, the schedule becomes a formal notice of the contractor’s plan and the owner is responsible for a reasonable understanding of the contents.

- **Cost of Maintaining Schedule** – A higher level of detail in activity identification typically results in increased cost of maintaining and statusing the schedule. This is an important tradeoff that the project team needs to consider in their planning.
- **Client Expectations** – The client/owner may have specific schedule requirements that may determine the level of detail required in activity identification.
- **Project Risk** – Typically high risk projects are planned in detail to assist in risk mitigation.
- **Measurable** – When identifying activities, the team should ensure that every activity can be easily measured and uniquely controlled.

“Rolling wave” is a schedule planning and development method in which near-term activities are planned in more detail than later term activities. It is particularly useful for long duration fiscally funded programs and is not generally recommended for projects. As the near term work or program is executed, the team will identify the subsequent detailed activities that are required and replace the corresponding summary activity “place holders”. Rolling wave planning is an activity planning technique reserved for experienced schedulers working on long-term/complex ventures. The inexperienced scheduler should seek guidance from the project management team before employing this technique.

Milestones are unique events with no duration that mark significant points in project execution. As part of the planning process, milestones should be identified by the project team, and included in the activity list.

Summary activities are a special grouping of activities that acquire the duration of the period of time between the predecessor and successor activity of the summary activity. They should be used only for summarizing a linked series of activities that occur between the span of the first predecessor and last successor activities. Summary activities are useful for presenting higher level graphics and tabular reports of discrete data.

During the activity planning process, it is critical that all work performance assumptions are clearly documented. Also, project scope interpretations, inclusions and exclusions, and other basis information should be documented. This documentation will help reduce the risk of error or misapplication in subsequent schedule development. Eventually, these assumptions will become a part of the written schedule basis document.

At the conclusion of the schedule planning sessions, the list of activities should be reviewed for completeness. That review should include:

- Does the list of schedule activities include the entire project scope?
- Have all major and long lead time procurements been included?
- Is the level of detail appropriate for the project phase, complexity, and risk?
- Can all activities be summarized according to the WBS?
- Does each activity have a single responsible and accountable individual?
- Have specialists been consulted for unique requirements?
- Have past project history and lessons learned been considered?
- Is each activity capable of being measured and uniquely identified?
- Have all significant project milestones been included?
- Have all activity assumptions been documented?
- Have external constraints and drivers been considered?

## REFERENCES

1. Hollmann, John K., Editor. *Total Cost Management Framework: A Process for Applying the Skills and Knowledge of Cost Engineering*, Morgantown, WV: AACE International, 2006.

**CONTRIBUTORS**

(May 3, 2007 Revision)

Lee J. Hobb, (Author)  
Ronald M. Winter, PSP  
Timothy T. Calvey, PE PSP  
Edward E. Douglas, III CCC PSP  
Earl T. Glenwright, Jr. PE PSP  
James G. Zack, Jr.

(March 26, 2004 Revision)

Jennifer Bates, CCE  
Steven G. J. Boeschoten  
Larry R. Dysert, CCC  
H. Ernest Hani  
H. Christian Heller  
John K. Hollmann, PE CCE  
Katrina D. Knight  
Philip D. Larson, CCE  
Wesley R. Querns, CCE  
Dr. Randy R. Rapp, PE CCE  
Richard A. Selg CCE  
Kul B. Uppal, PE