list of model parameters

| Variable Type | Variable Names | Equation | Unit of Measure | Description | Exogenous/ Endogenous |
| --- | --- | --- | --- | --- | --- |
| Constant | Initial Planned Project Labor-hours | 7,200 | Labor-hour | Assume the initial project planned 7200 labor-hours | Exogenous |
| Constant | No. of Labor | 15 | Labor | Assume 15 labor work on this project | Exogenous |
| Constant | Labor Working-hours per Week | 40 | Labor-Hour/(Week×Labor) | Assume 40 hours per week for each labor | Exogenous |
| Constant | Seed | 1 | Dimensionless | Steam ID | Exogenous |
| Auxiliary | Performance Factor | RANDOM TRIANGULAR | Dimensionless | Performance Factor = Earned labor-hours/Actual labor-hours, without considering scope changes, RFIs, and rework. Generate random performance factor using a triangular distribution from the minimum performance factor to the maximum performance factor with a peak at the most likely performance factor. | Exogenous |
| Flow | Factored Labor Work Rate |  | Labor-hour/Week | Earned Labor-hours for each week without the impacts of rework, RFIs, and scope change. | Endogenous |
| Auxiliary | Stop Indicator |  | Dimensionless | Indicator for stopping the simulation when "Project Labor-hours to be Completed" is reaching " Labor Working-hours per Week " to ensure no negative hours will be generated. |  |
| Auxiliary | RFI Rate | RANDOM TRIANGULAR | Dimensionless | RFI rate = labor-hours require RFI/initially Planned project labor-hours. Generate random RFI rate using a triangular distribution from the minimum RFI rate to the maximum RFI rate with a peak at the most likely RFI rate. | Exogenous |
| Auxiliary | Scope Change Rate on the Initial Project Scope | RANDOM TRIANGULAR | Dimensionless | Scope Change Rate on the Initial Project Scope = scope change labor-hours/initially Planned project labor-hours. Generate random scope change rate on the initial project scope using a triangular distribution from the minimum scope change rate on the initial project scope to the maximum scope change rate on the initial project scope with a peak at the most likely scope change rate on the initial project scope. | Exogenous |
| Auxiliary | % of RFI for Scope Change | RANDOM TRIANGULAR | Dimensionless | % of RFI for Scope Change = scope change labor-hours/initially Planned project labor-hours. Generate random % of RFI for Scope Change using a triangular distribution from the minimum % of RFI for Scope Change to the maximum % of RFI for Scope Change with a peak at the most likely % of RFI for Scope Change. | Exogenous |
| Auxiliary | Meet Requirement Rate | RANDOM TRIANGULAR | Dimensionless | Meet Requirements rate = 1 - (rework labor-hours/initially Planned project labor-hours). Generate random performance factor using a triangular distribution from the minimum meet requirement rate to the maximum meet requirement rate with a peak at the most likely meet requirement rate. | Exogenous |
| Flow | Labor Work Rate for Initial Project Scope |  | Labor-hour/Week | Equal to Effective Labor Work Rate until all initial project scope is completed. | Endogenous |
| Stock | Initial Planned Project Labor-hours Completed | INTEGAL (Labor Work Rate for Initial Project Scope, 0) | Labor-hour | Labor-hours and duration are required to complete the initially planned project during the construction. The initial value is set up at 0. | Endogenous |
| Flow | RFI Generation Rate (Initial Scope) | Labor Work Rate for Initial Project Scope × RFI Rate | Labor-hour/Week | Labor-hours requires RFIs on the initial project scope for each week | Endogenous |
| Flow | RFI Generation Rate (Scope Change on Initial Scope) |  | Labor-hour/Week | Labor-hours requires RFIs on scope changes of the initial project scope for each week | Endogenous |
| Stock | Wasted Labor-hours Due to RFIs | INTEGAL (RFI Generation Rate (Initial Scope) + RFI Generation Rate (Scope Change on Initial Scope), 0) | Labor hour | Labor-hours lost due to waiting for RFI response; the initial value is 0. | Endogenous |
| Flow | Scope Change Generation Rate on Initial Scope |  | Labor-hour/Week | Labor-hours generated from the initial scope for scope change | Endogenous |
| Flow | Scope Change Generation Rate on RFI |  | Labor-hour/Week | Labor-hours generated from RFI responses for scope change | Endogenous |
| Flow | Effective Labor Work Rate |  | Labor-hour/Week | Labor-hours per week to complete tasks which meet requirements. Including the delay caused by RFI | Endogenous |
| Flow | Rework Generation Rate |  | Labor-hour/Week | Labor-hours per week to complete tasks which don’t meet requirements. | Endogenous |
| Constant | Time to Discover Rework | 3.05 | Week | The average time between the completion of a task and discovering it needs to be redone. The value is assumed. | Exogenous |
| Flow | Rework Discovery Rate |  | Labor-hour/Week | Labor-hours per week require rework. | Endogenous |
| Stock | Generated Rework | INTEGAL (Rework Generation Rate - Rework Discovery Rate, 0) | Labor-hour | Labor-hours are required to rework; the initial value is 0. | Endogenous |
| Stock | Project Labor-hours to be Completed | INTEGAL (Scope Change Generation Rate on Initial Scope + Scope Change Generation Rate on RFI + Rework Discovery Rate - Effective Labor Work Rate - Rework Generation Rate,7200) | Labor-hour | Labor-hours are required to complete the RR project; the initial value is 7,200 labor-hours | Endogenous |
| Stock | Work Completed Meet Requirement | INTEGAL (Effective Labor Work Rate,0) | Labor-hour | Labor-hours are used for work that meets requirements. the initial value is 0. | Endogenous |
| Stock | Project Total Factored Labor-hours | INTEGAL (Effective Labor Work Rate + Rework Generation Rate + RFI Generation Rate (Initial Scope) + RFI Generation Rate (Scope Change on Initial Scope), 0) | Labor-hour | Actual project duration is required to complete the project; the initial value is 0. Total labor-hours include effective labor hours, rework generation rate, and RFI Generation rate (on the initial scope and scope change). Total labor hours is based on Factored The labor work rate. | Endogenous |