# Optimize Controls to be in effect

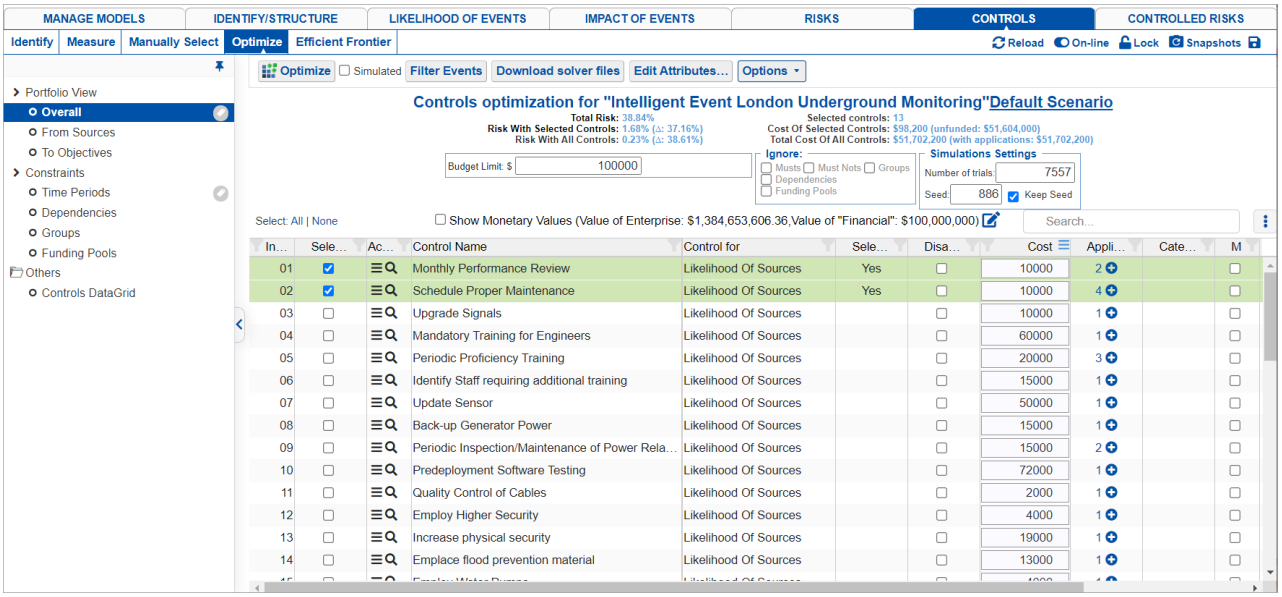
After identifying and measuring all the potential controls, you can now select which of these controls will be in effect either:

- manually, or
- by optimization

On this page, we will determine the controls to be funded by Optimization.

The Portfolio View displays a similar grid as with the manually select control grid.

On the Optimization page, we can define the **Budget Limit** and other **constraints** (Musts, Must Nots, Groups, Dependencies, Funding Pools) to be used or ignored in order to determine the controls to be in effect.




The **Must** and **Must Not** are defined from the controls grid by checking from the "Must" and "Must Not" columns.

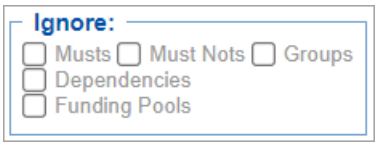
- **Must** - the control must be selected on the optimization. This setting is ignored when manually selecting a control.
- **Must Not** - the control must not be selected on the optimization. This setting is ignored when manually selecting a control.

Other constraints are defined from their specific pages ( Dependencies, Groups, Funding Pools)

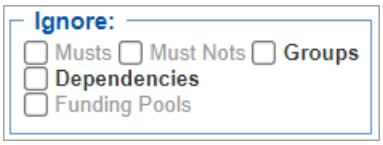
The budget limit is entered here:


This means that the solution should have total costs for the funded controls not exceeding the specified budget limit.

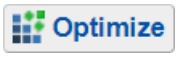
In our example above, we do not have any other constraints defined as determined from the Ignore options:



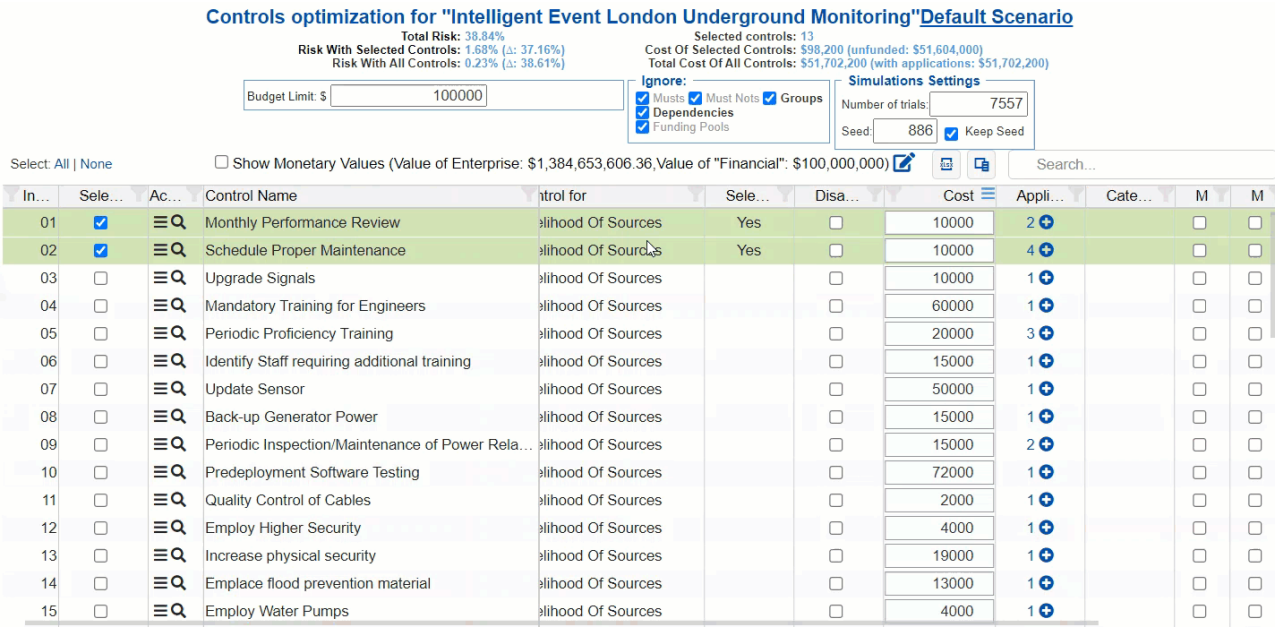
When a constraint is defined, the constraint name will be **bold**, see Groups and Dependencies.




You can check the constraints you want to ignore in the optimization.

Click  to solve.


The funded controls are selected and will have a green background color. If you have many controls, use the scroll to the right of the grid to view more controls.

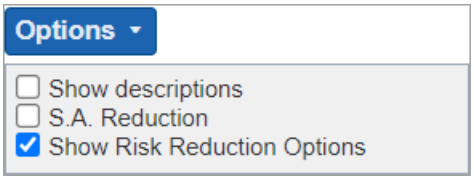



Additional information is also displayed at the top of the grid. The data are changing automatically whenever the selection of the controls is changed, as applicable


- **Total Risk** - the sum of all the risks without controls Σ(Likelihood*Impact)
- **Risk With Selected Controls** - Total risk when the selected controls are applied (delta = Total Risk - Risk with selected controls)
- **Risk With All Control**s - Total risk if All the Controls are applied, excluding the disabled control(s)
- **Selected controls** - Total number of the currently selected controls
- **Cost Of Selected Controls** - Sum of costs of the currently selected controls (Sum Costs of the unfunded controls)
- **Total Cost of All Controls** -- Total cost of all the controls, excluding the disabled control(s)

Other than the Budget Limit, you can also optimize by " **Risk**" and "**Risk Reduction**".

These two options can be enabled from Options > Show Risk Reduction Options:




By doing so, you will see two tabs to the right of Budget:


- **Risk** - instructs the optimizer that the resulting solution should have Risk with controls should not exceeding %risk you specified


- **Risk Reduction** - instructs the optimizer that the resulting solution's Risk (Total Risk - Risk with Selected Controls) should be reduced by X%.