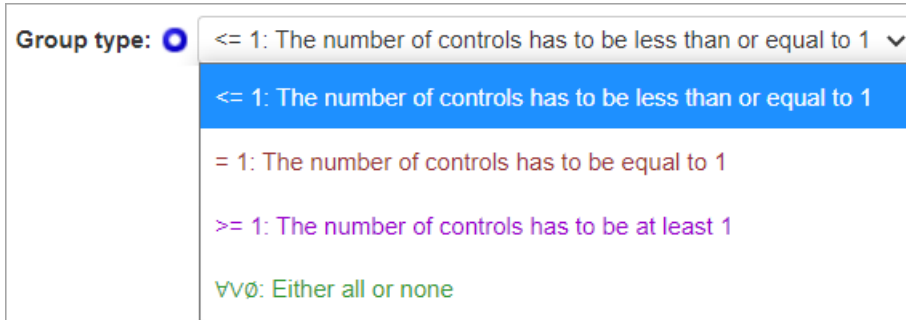


Groups Constraints


Groups are one of the constraints that can be defined when determining the controls to be selected in an [Optimization](#).

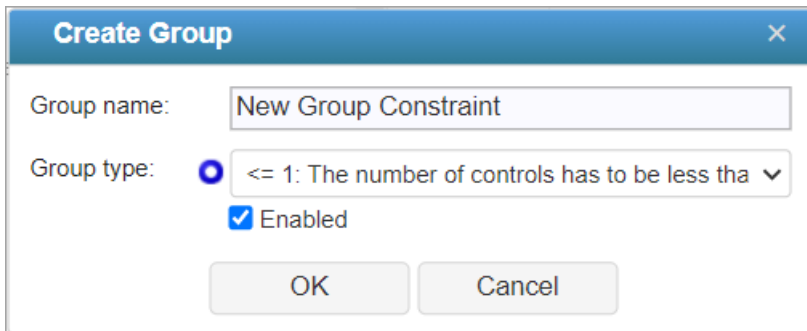
When optimizing, groups can be defined to assure that one of the following four relationships exist among the controls in a group:



A screenshot of a dropdown menu for selecting a group type. The menu is open, showing five options. The first option, '<= 1: The number of controls has to be less than or equal to 1', is highlighted in blue. The other options are: '= 1: The number of controls has to be equal to 1', '>= 1: The number of controls has to be at least 1', and '∀∅: Either all or none'.

- At most one control in the group will be selected (that is no control or one control in the group will be selected)
- Exactly one control in the group will be selected
- At least one control in the group will be selected
- Either all or none

Click  to add a new group constraint.



A screenshot of the 'Create Group' dialog box. The dialog has a title bar with 'Create Group' and a close button. It contains a text input field for 'Group name' with the value 'New Group Constraint'. Below it is a 'Group type' dropdown menu with the selected option '<= 1: The number of controls has to be less than or equal to 1'. There is a checked checkbox labeled 'Enabled'. At the bottom are 'OK' and 'Cancel' buttons.

Enter the group constraint name and select from the group type pull-down menu.

Click OK.

The added group will be displayed on the right:

All Controls: Search: All | None

- 1. Monthly Performance Review
- 2. Schedule Proper Maintenance
- 3. Upgrade Signals
- 4. Mandatory Training for Engineers
- 5. Periodic Proficiency Training
- 6. Identify Staff requiring additional training
- 7. Update Sensor
- 8. Back-up Generator Power
- 9. Periodic Inspection/Maintenance of Power Relay Station
- 10. Predeployment Software Testing
- 11. Quality Control of Cables
- 12. Employ Higher Security
- 13. Increase physical security
- 14. Emplace flood prevention material
- 15. Employ Water Pumps
- 16. Periodic System Functional Checks
- 17. Planned System Software Upgrades
- 18. Prevent External Network Attacks
- 19. Network Access Protocols
- 20. Monthly Software Control Board
- 21. Internal Emergency Communication System
- 22. Monitoring Gate System Approach
- 23. Reprimand
- 24. Frequent Monitoring and Replacement (Signals/Sensors/Cables)
- 25. Engineer Credentials
- 26. On the spot training

Show costs Total Cost: 1,857,200

Groups: All | None

#1 New Group Constraint

Select controls (if any) on the left and click **»** to add them into this group

Click **+** on top to add a new group

You can add controls to be a member of the group by selecting from the controls at the left and then clicking the



You can then remove controls from the group by selecting them from the right side list and then clicking the

All Controls: Search: All | None

- 1. Monthly Performance Review
- 2. Schedule Proper Maintenance
- 3. Upgrade Signals
- 4. Mandatory Training for Engineers
- 5. Periodic Proficiency Training
- 6. Identify Staff requiring additional training
- 7. Update Sensor
- 8. Back-up Generator Power
- 9. Periodic Inspection/Maintenance of Power Relay Station
- 10. Predeployment Software Testing
- 11. Quality Control of Cables
- 12. Employ Higher Security
- 13. Increase physical security
- 14. Emplace flood prevention material
- 15. Employ Water Pumps
- 16. Periodic System Functional Checks
- 17. Planned System Software Upgrades
- 18. Prevent External Network Attacks
- 19. Network Access Protocols
- 20. Monthly Software Control Board

Show costs Total Cost: 0

Groups: All | None

#1 New Group Constraint

Select controls (if any) on the left and click **»** to add them into this group

Click **+** on top to add a new group