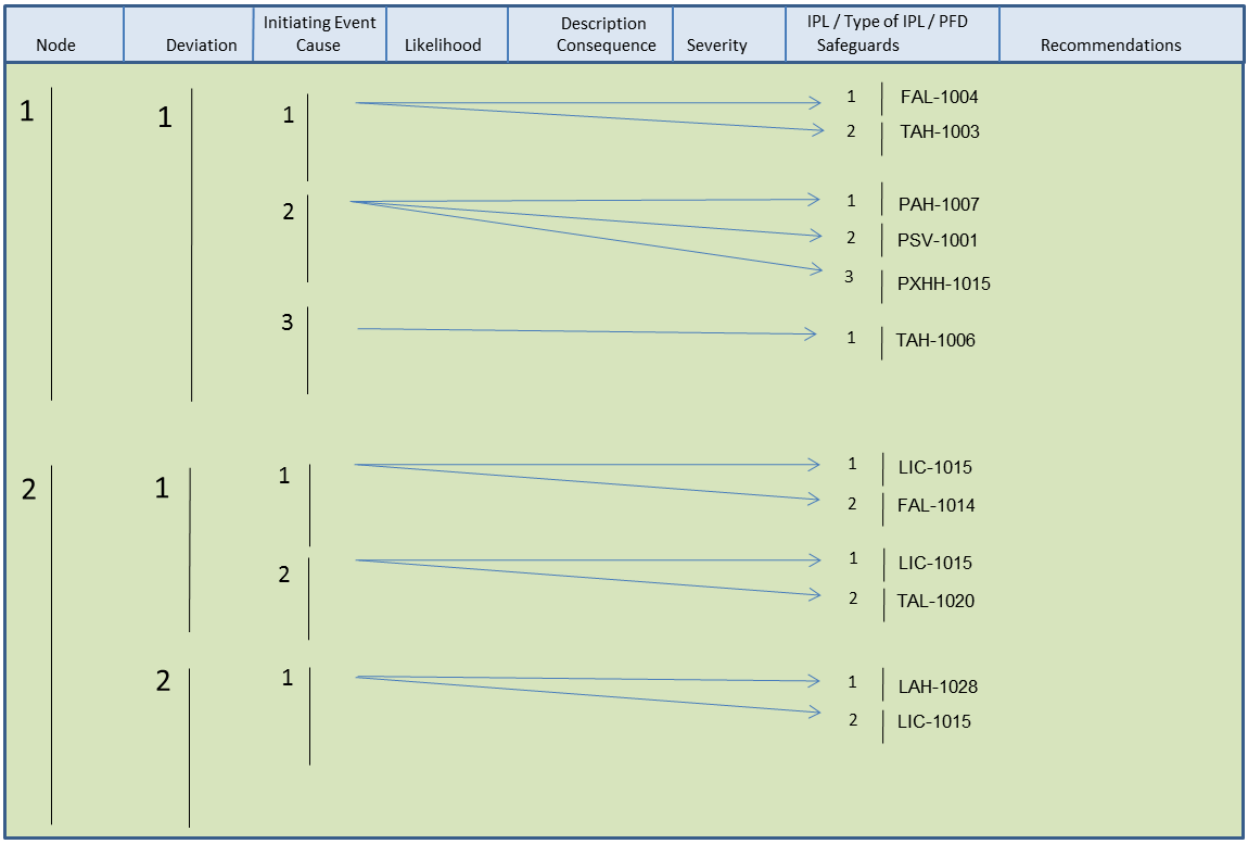
1. Importing a HAZOP

SafeGuard Profiler™ lets you import a HAZOP for use as input for performing a LOPA. Export the completed HAZOP as a CSV (comma-separated value) file from a HAZOP application.

1.1. HAZOP CSV Format

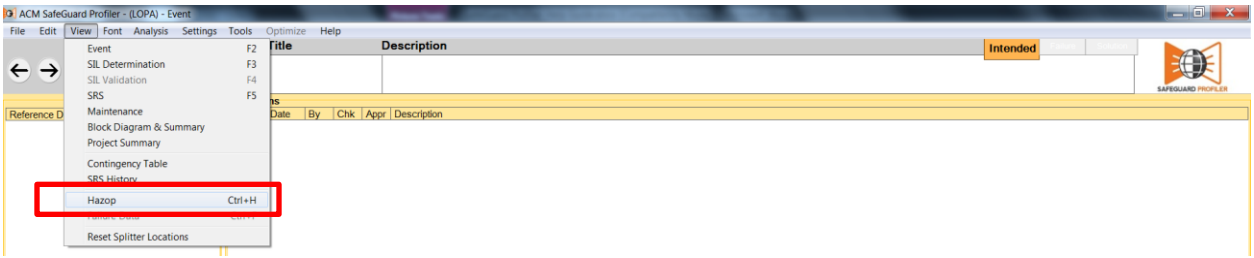
Ensure the HAZOP CSV file you wish to import has the following structure (column header text is suggested only):



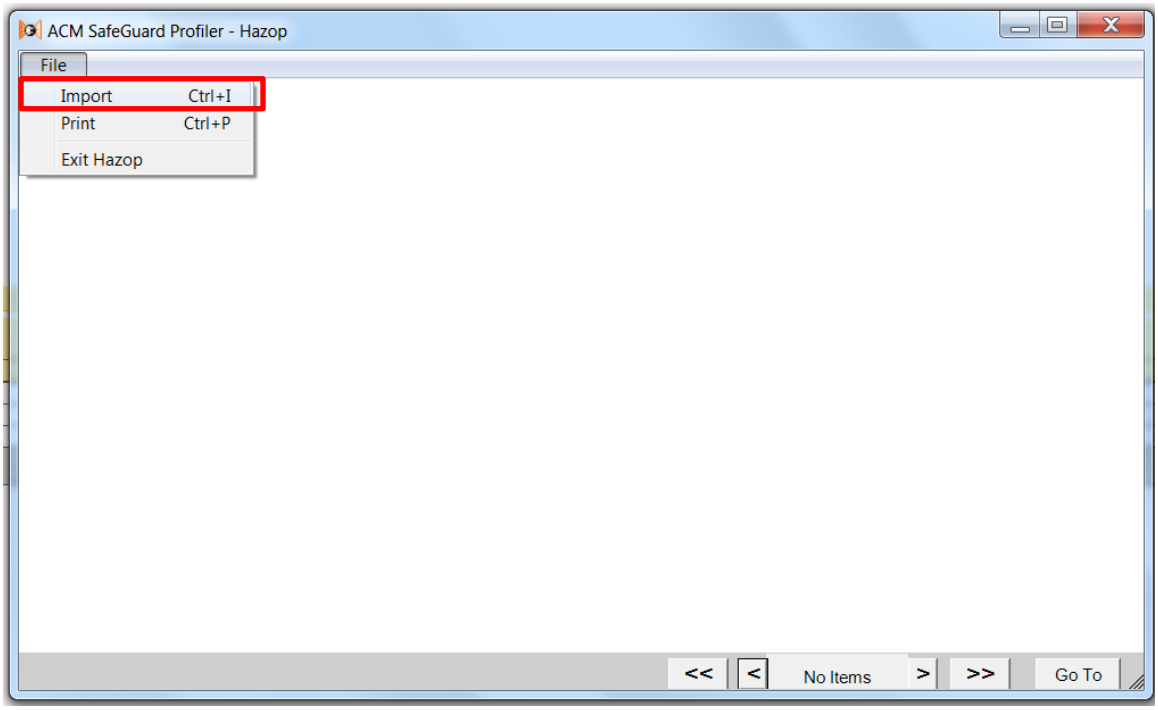
Node	Deviation	Initiating Event Cause	Likelihood	Safeguards / MOD IPL / Type of IPL / PFD
1. LPG Splitter	1. no/low LPG flow (Loss of supply)	1. process upstream upset, loss of supply	0.125	1. FAL-1004
1. LPG Splitter	1. no/low LPG flow (Loss of supply)	1. process upstream upset, loss of supply	0.125	2. TAH-1003
1. LPG Splitter	1. no/low LPG flow (Loss of supply)	2. High pressure	0.25	1. PAH-1007
1. LPG Splitter	1. no/low LPG flow (Loss of supply)	2. High pressure	0.25	2. PSV-1001
1. LPG Splitter	1. no/low LPG flow (Loss of supply)	2. High pressure	0.25	3. PXHH-1015
1. LPG Splitter	1. no/low LPG flow (Loss of supply)	3. High butane Temperature	0.25	1. TAH-1006
2. Re-boiler	1. no/low steam flow (Loss of steam supply)	1. Control loop malfunction FIC-065	0.1	1. LIC-1015
2. Re-boiler	1. no/low steam flow (Loss of steam supply)	1. Control loop malfunction FIC-065	0.1	2. FAL-1014
2. Re-boiler	1. no/low steam flow (Loss of steam supply)	2. Offspec butane	1	1. LIC-1015
2. Re-boiler	1. no/low steam flow (Loss of steam supply)	2. Offspec butane	1	2. TAL-1020
2. Re-boiler	2. no/low condensate flow (no condensate flow)	1. Control loop malfunction LIC-1018	0.1	1. LAH-1028
2. Re-boiler	2. no/low condensate flow (no condensate flow)	1. Control loop malfunction LIC-1018	0.1	2. LIC-1015

1.2. Importing a CSV File

In Profiler, on the Event page, select View > HAZOP.

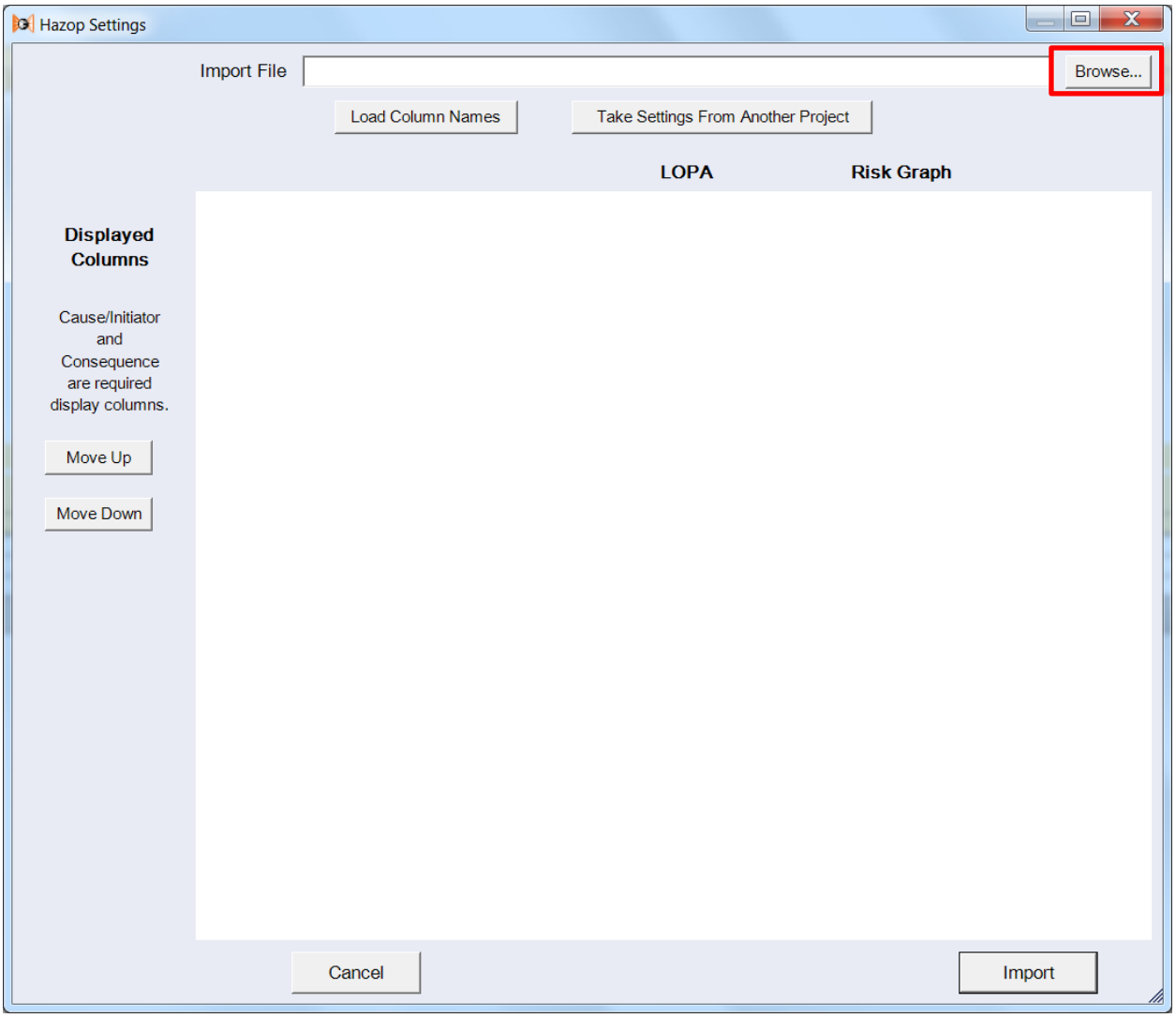


In the “HAZOP” window, select File > Import from the top menu.



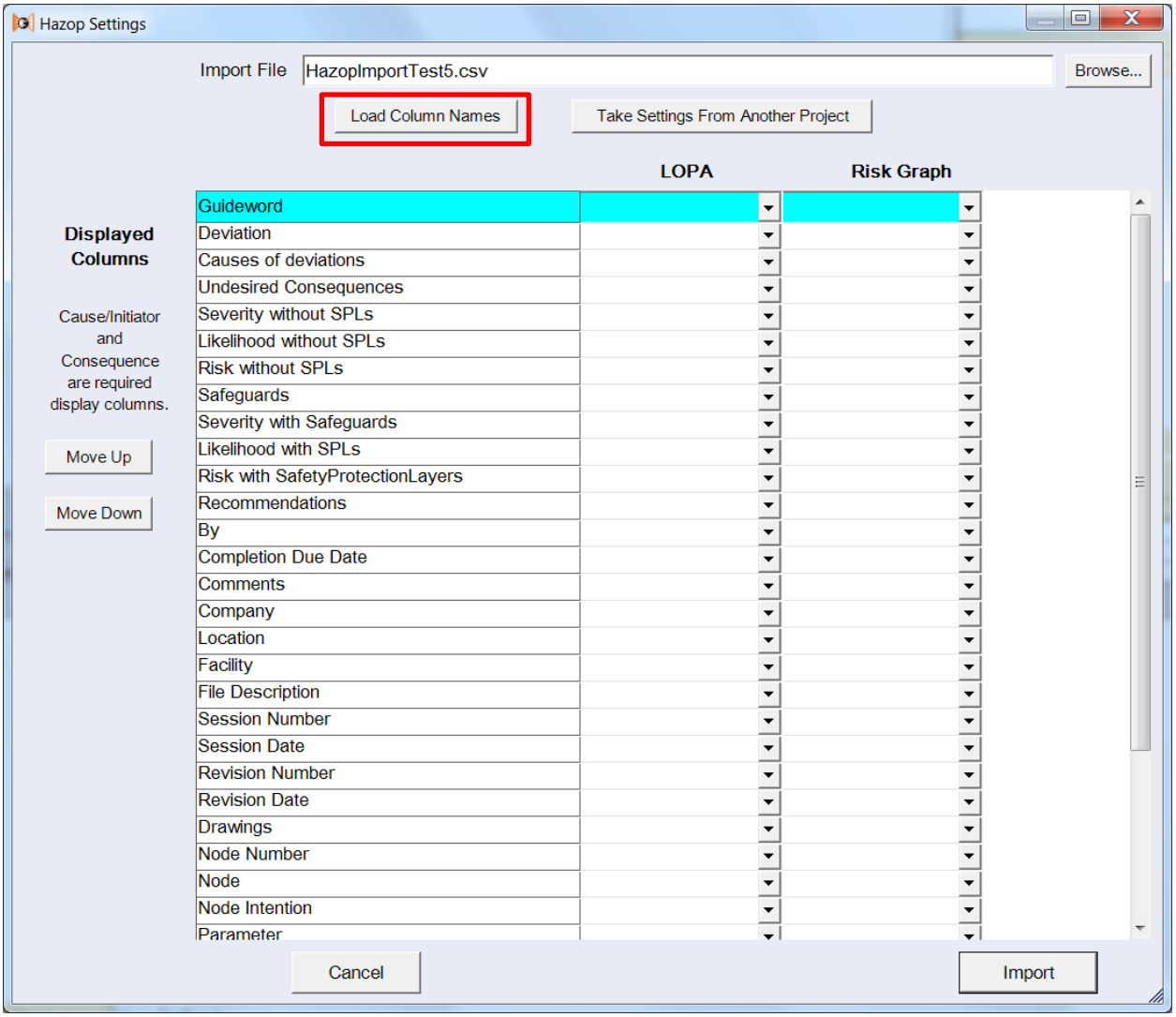
In the “HAZOP Settings” window, click “Browse” at the top right.

Locate the HAZOP CSV file for importing, select the file and click “Open”.



Once the file’s path name appears in the “Import File” field, click “Load Column Names”.

The window will update with a list of column headings loaded from the CSV file.



1.3. HAZOP Display Setup

Link the column names from the HAZOP CSV file to existing LOPA fields as follows:

HAZOP	LOPA
Node	Node
Deviation	Scenario (Deviation)
Causes	Cause / Initiating Event
Consequences	Consequence
S [first instance]	Severity [i.e. Severity before Safeguards]
L [first instance]	Likelihood [i.e. Likelihood before Safeguards]
RR [first instance]	Risk Ranking [i.e. RR before Safeguards]
Exist. Safeguards	Protection Layer (Safeguard)
S [second instance]	Severity with SPLs [i.e. Severity after Safeguards]

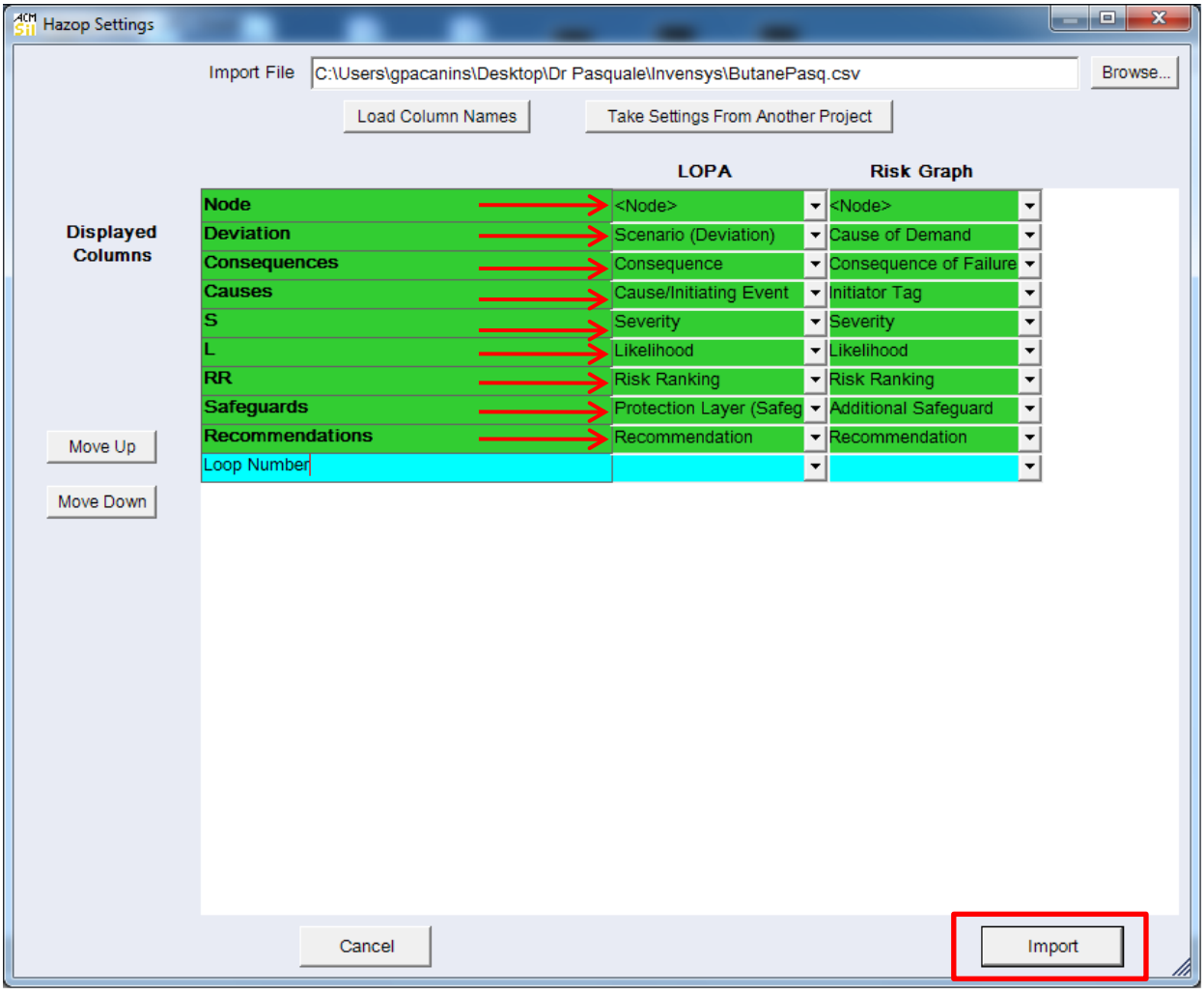
L [second instance]	Likelihood with SPLs [i.e. Likelihood after Safeguards]
RR [second instance]	Risk Ranking with SPLs [i.e. RR after Safeguards]
Recommendations	Recommendation
Remarks	Notes

If you do not require all the HAZOP columns to perform a LOPA, SafeGuard Profiler™ allows you to select a subset of HAZOP data for import into the HAZOP display window.

For each desired HAZOP column name, right click on the name and select “Display Column”.

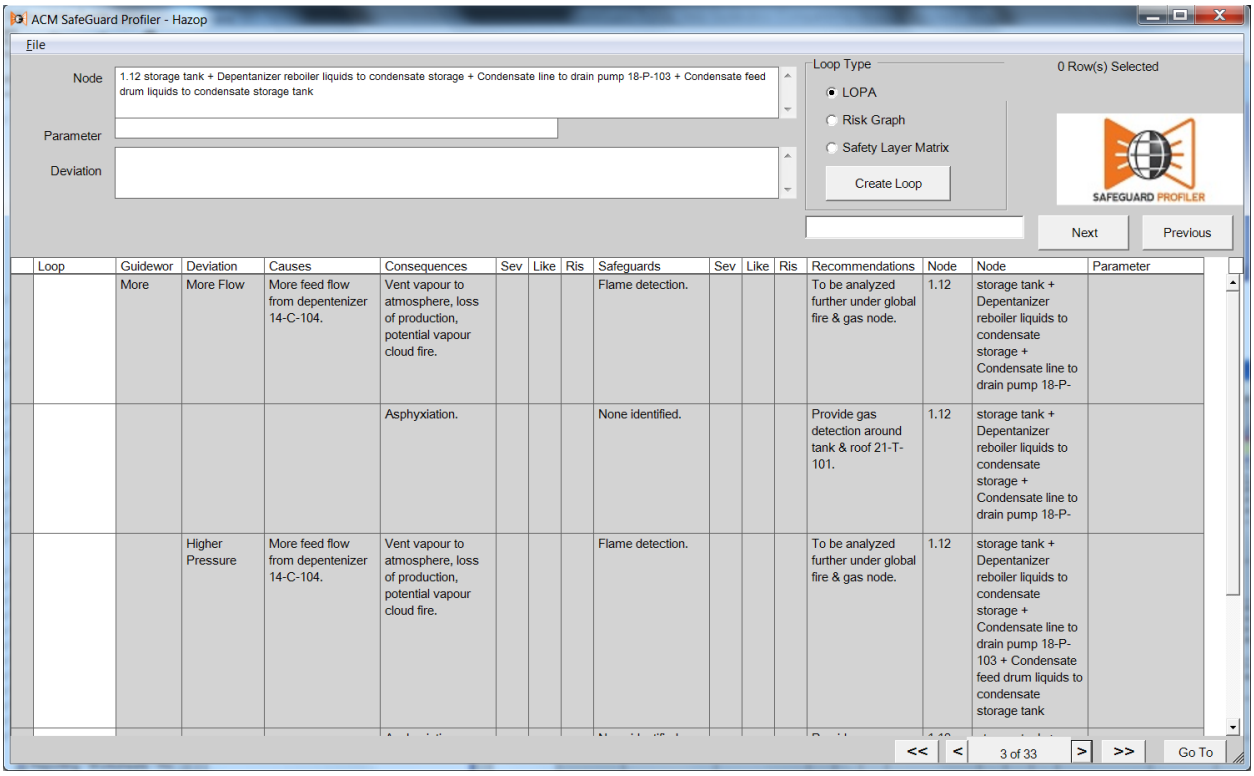
The name, along with its linked LOPA and Risk Graph fields, will be highlighted.

Note: At a minimum, SafeGuard Profiler™ requires you to link the “Cause / Initiating Event” and “Consequence” fields under “LOPA” with column names loaded from the HAZOP CSV file.



Click “Import”.

The import process may take a few seconds.

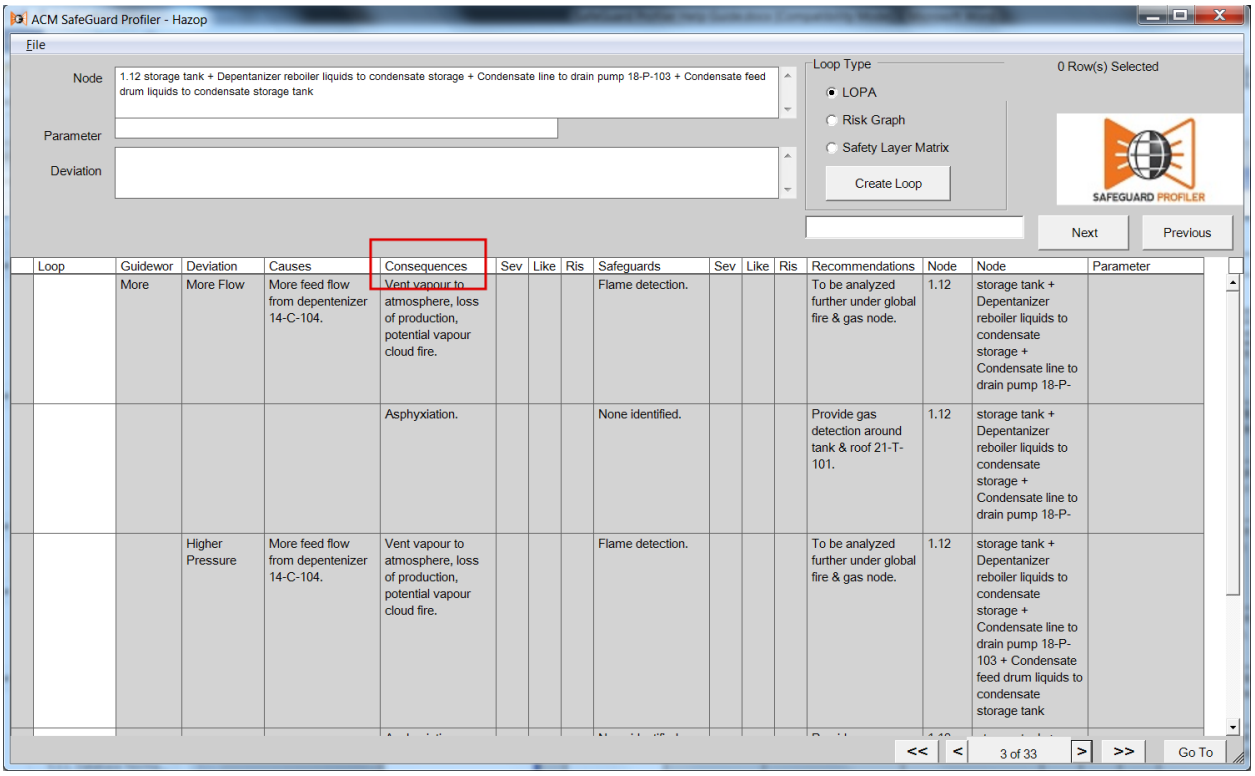


Prior to commencing the LOPA process, check the imported HAZOP against the original, to ensure all the relevant data was imported successfully.

2. Creating LOPA Loops from an Imported HAZOP

2.1. Locating and Highlighting Consequences

The process of creating LOPA loops for analysis begins with the imported HAZOP display window.

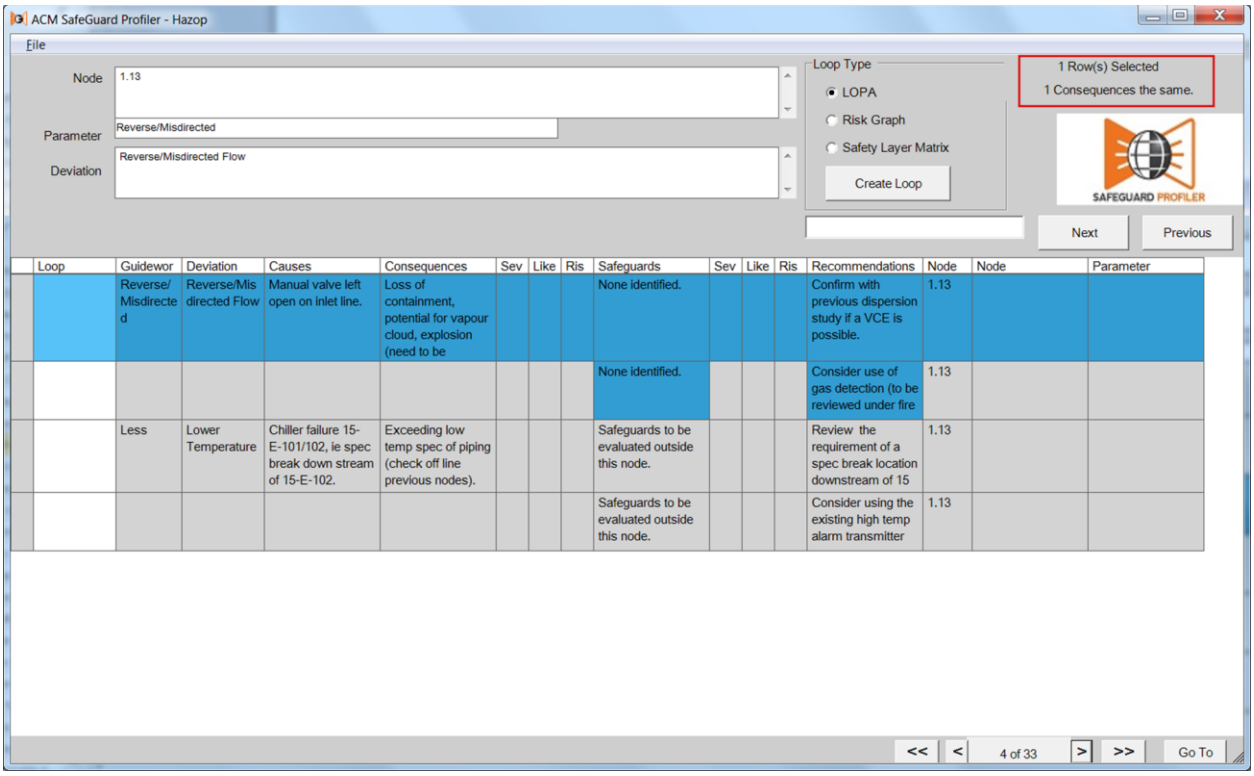


LOPA is a consequence-based analysis. Therefore the emphasis is on the consequence column of the HAZOP.

Right click on the desired “Consequence” field and select “Smart Select for Create Loop.”

This consequence and its associated causes and safeguards will be highlighted in blue, as shown.

Note the “Row(s) Selected” message in the top right of the window. If it reports greater than one “Consequence the same,” then there are at least two instances of the same consequence that need to be located and included in this loop.



Note: Because HAZOP consequence descriptions may not always be copied verbatim by the facilitator, take care to identify similarly worded consequence descriptions. For a selected consequence, the number of instances reported by SafeGuard Profiler™ are those with descriptions which match verbatim.

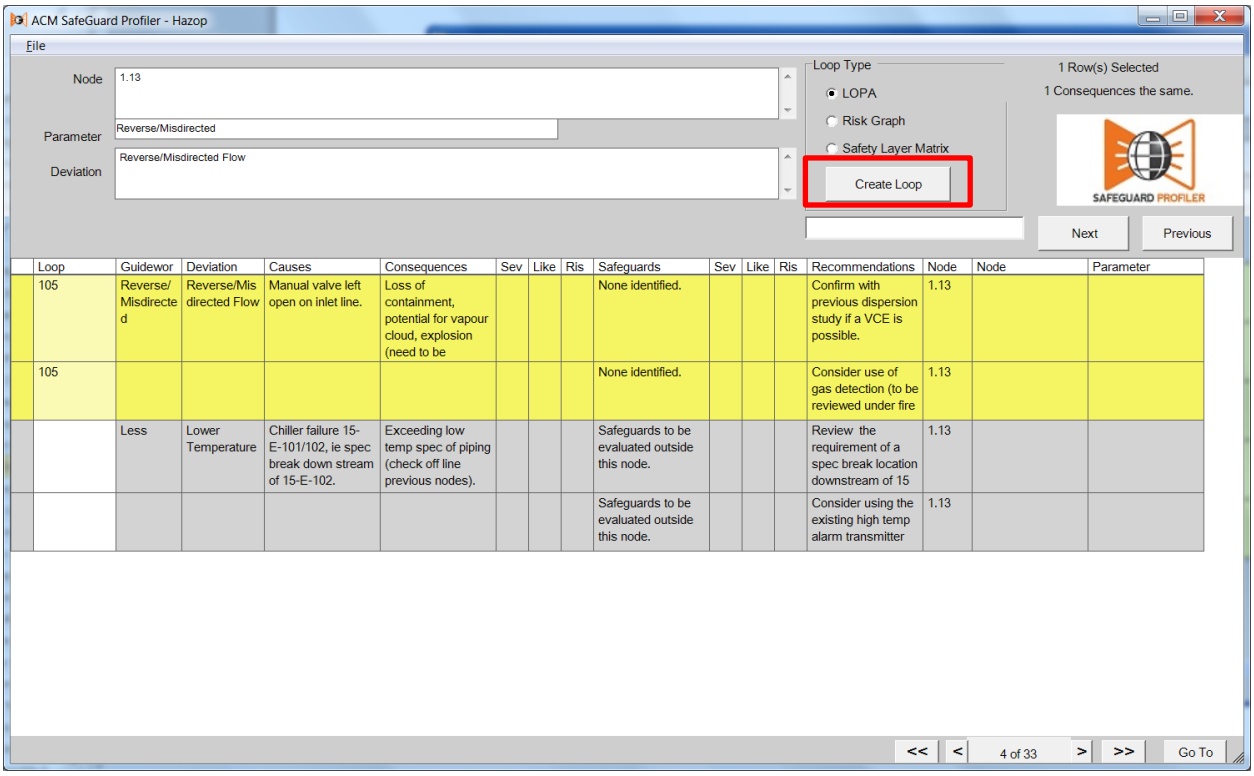
Ensure only consequences with matching categories (i.e. H&S, ENV, ASSET, Reputation) and matching Severity are grouped.

Similar consequences with different Severity/Category **must not** be grouped.

2.2. LOPA Loop Creation

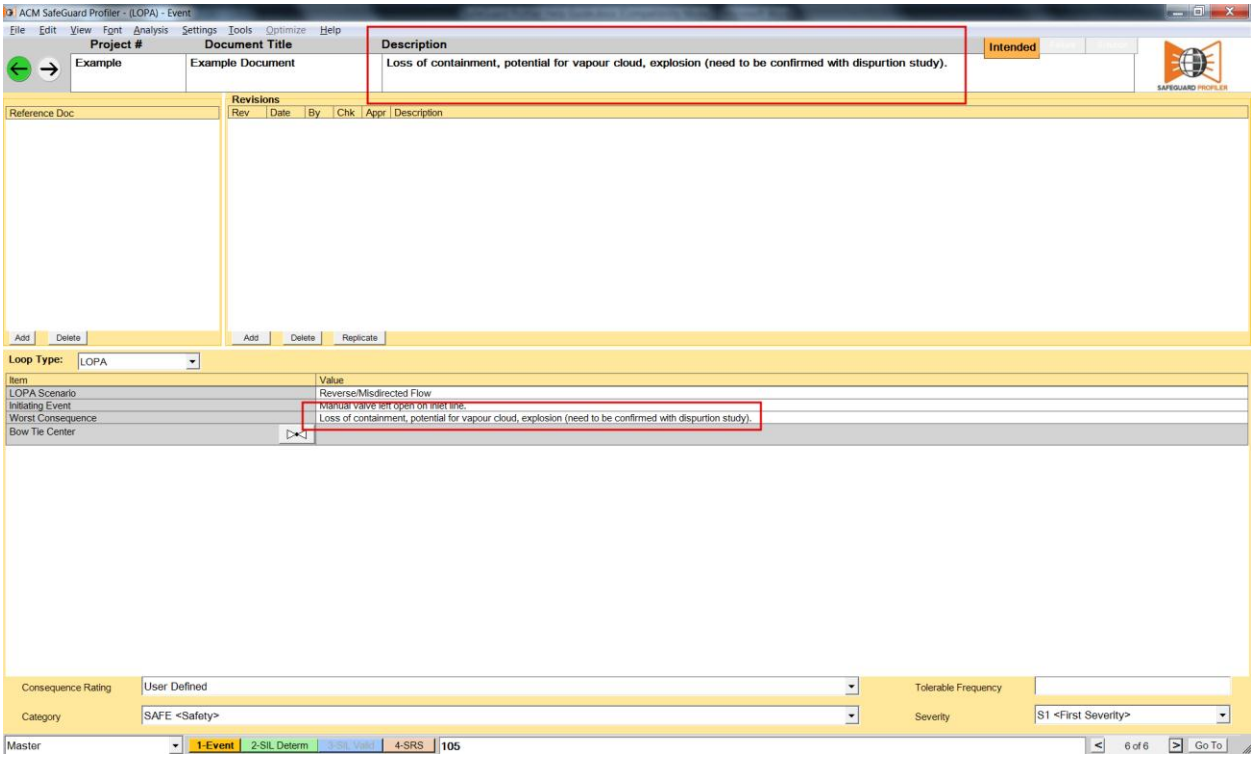
Once the desired “Consequence” fields have been Smart Selected, select “LOPA” for “Loop Type,” then click “Create Loop”.

The Smart Selected cells will be highlighted yellow to reflect that their contents have used in a generated loop. The generated loop’s number will appear in the “Loop Number” column.



Note: In the context of SafeGuard Profiler™, a LOPA “loop” refers to a LOPA scenario, based on a defined consequence.

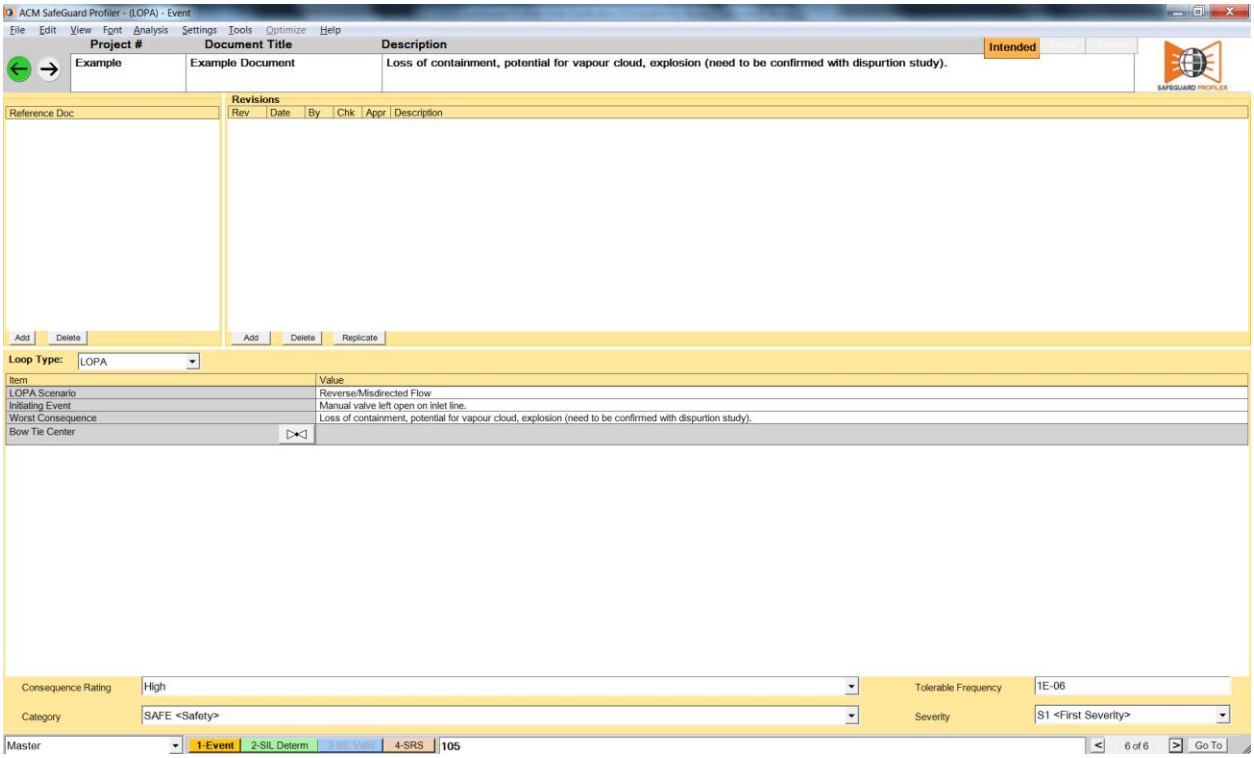
Minimize the HAZOP display window. The Event page will reflect the HAZOP data used to create the newly generated loop.



We recommend copying the key words of the consequence into the blank “Description” field at the top of the page to identify the scenario being analyzed.

2.3. Tolerable Frequency Criterion

Enter the tolerable frequency criterion against which this scenario will be evaluated. Recall the HAZOP display window and note the severity rating for the selected consequence. From the “Consequence Rating” dropdown list, select the matching severity. (This is why only consequences with the same level of severity can be grouped.)



This completes the creation and setup of a LOPA scenario for detailed analysis.