BOOLEAN MODULES NEWS 2016

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SUMMARY (1/2)

- Ordering choices
- News laws:
  - Full periodic test with defined times;
  - Dormant exponential;
  - Undefined.
- Create curves directly in contextual menu
- Law edition table
- Quick creation of events
- Quick event insertion
- Progress bar
- Calculation before test period

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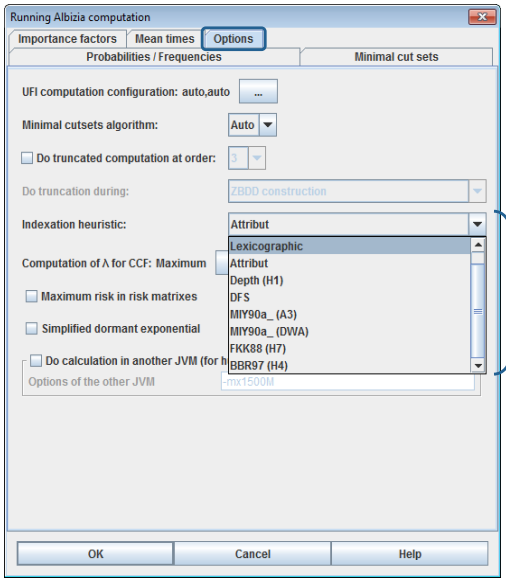
SUMMARY (2/2)

- Display mean times in results
- New results table for minimal cut sets
- Results on watched sub-tree
- Uncertainties on parameters
- Logic solver defined by a fault tree
- Better incorporation of Etree in Bool module
- Switch shortcut and its source
- Search for shortcuts
- Import/Export improvements (Open-PSA/.dag)
- Add a part of a scenario in ETree

ORDERING CHOICES



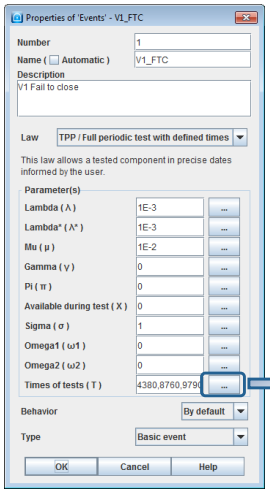
Several choices of heuristic to order BDD construction

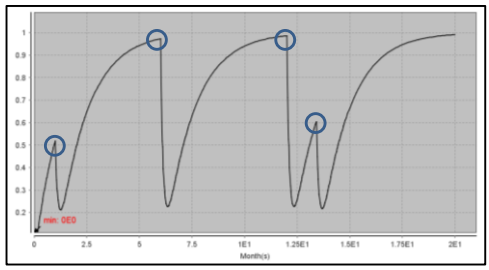
By default, the algorithm used is FKK88

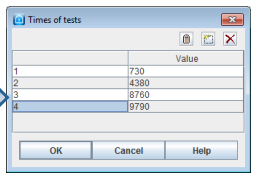
Note: Attribut can be used only in RESEDA

NEWS LAWS

- Full periodic test with defined times:





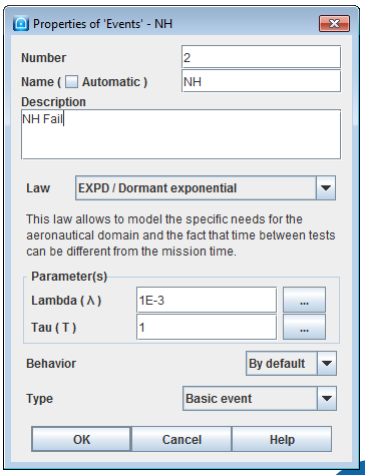


NEWS LAWS

- Dormant exponential:

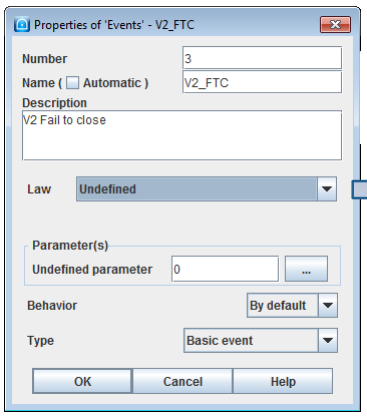
– This law is used to model the dormant events in a more precise way than with a simple dormant law. It has three parameters: the failure rate of the component (supposed constant during the time), the test periodicity and the mission time.

This last parameter is not typed by the user. It corresponds to the last computation time asked by the user.



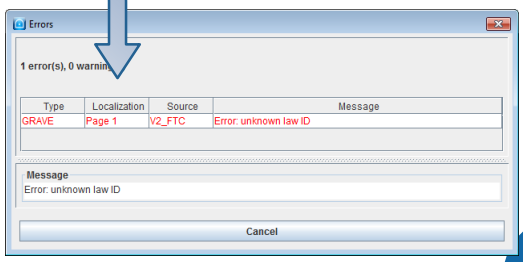
NEWS LAWS

- Undefined:



It is not possible to run calculations with an Undefined law

Very useful when the Undefined law is defined as the default law in the option.



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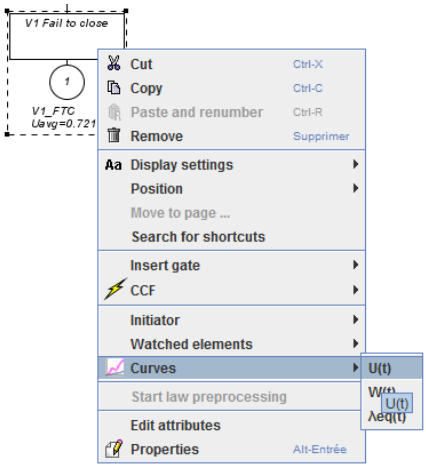
CREATE CURVES DIRECTLY



Right click on the event/gates/blocs end select curves in the menu.

The curve is drawn in the input area and updated automatically when results changed.

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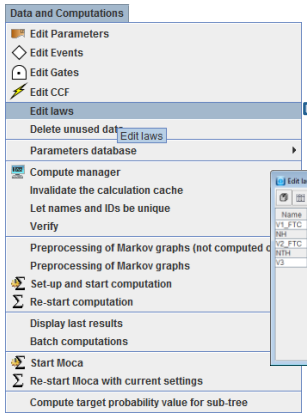
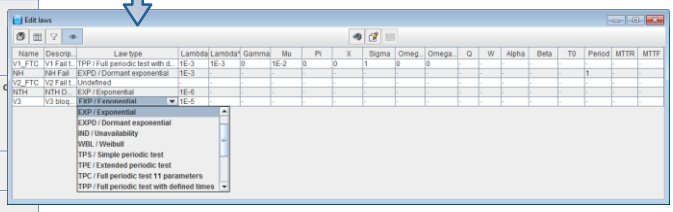
GRIF BOOLEAN MODULES 2016

LAW EDITION TABLE



All parameters for all elements having laws are described.

Parameters can be changed in this table



With a double click, law can be changed

If the parameter is in the new law, the parameter is kept

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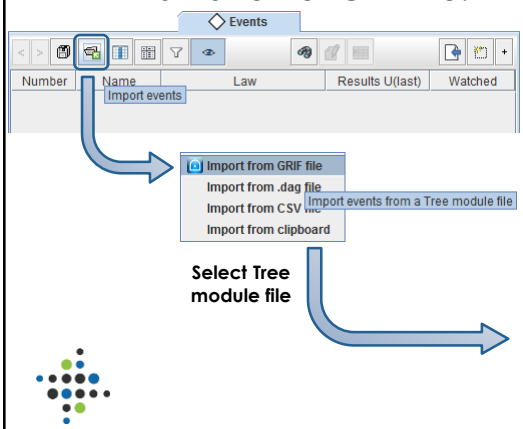
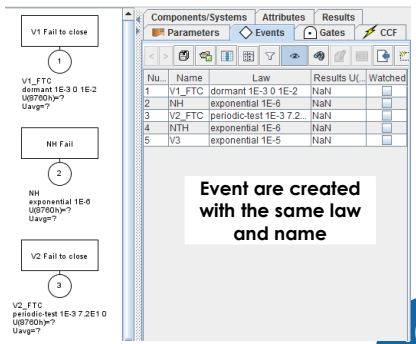
GRIF BOOLEAN MODULES 2016

QUICK CREATION OF EVENTS

- Only in module Tree
  - If the user has already created all the event in an another GRIF file:





Event are created with the same law and name

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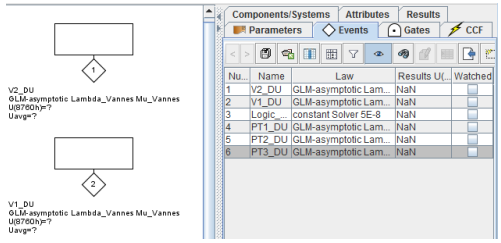
QUICK CREATION OF EVENTS

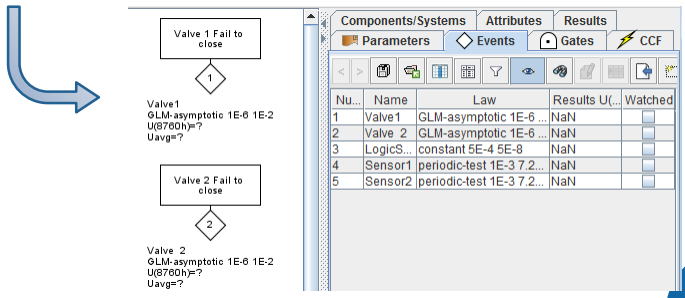
- Only in module Tree
  - The same methods can be used to import events using a dag file;



QUICK CREATION OF EVENTS

- Only in module Tree
  - Or a CSV file.

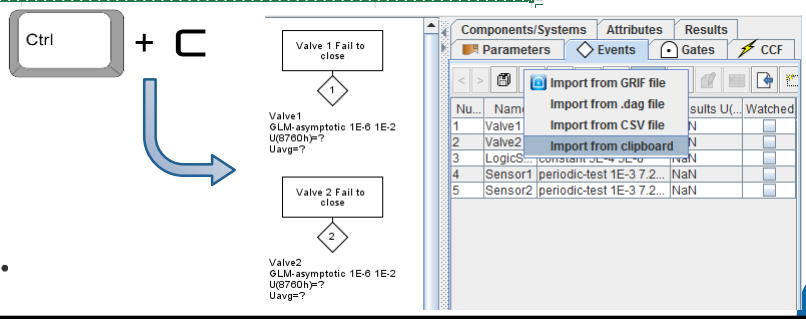
	A	B	C	D
1	ID	NOM	LOI	DESCRIPTION
2	1	Valve1	GLM-asymptotic 1E-6 1E-2	Valve 1 Fail to close
3	2	Valve_2	GLM-asymptotic 1E-6 1E-2	Valve 2 Fail to close
4	3	LogicSolver	constant 5E-4 5E-8	Logic Solver SIL4
5	4	Sensor1	periodic-test 1E-3 7.2E1 0	Sensor 1 Spurious signal
6	5	Sensor2	periodic-test 1E-3 7.2E1 0	Sensor 2 Spurious signal



QUICK CREATION OF EVENTS

- Only in module Tree
  - Or from clipboard.

	A	B	C	D
1	ID	NOM	LOI	DESCRIPTION
2	1	Valve1	GLM-asymptotic 1E-6 1E-2	Valve 1 Fail to close
3	2	Valve 2	GLM-asymptotic 1E-6 1E-2	Valve 2 Fail to close
4	3	LogicSolver	constant 5E-4 5E-8	Logic Solver SIL4
5	4	Sensor1	periodic-test 1E-3 7.2E1 0	Sensor 1 Spurious signal
6	5	Sensor2	periodic-test 1E-3 7.2E1 0	Sensor 2 Spurious signal



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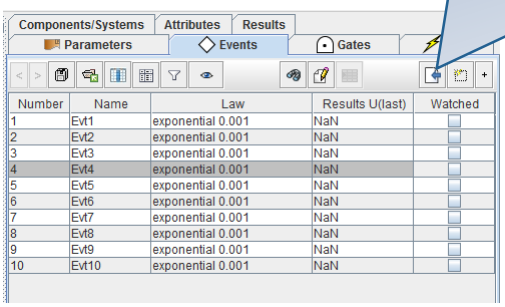
QUICK EVENT INSERTION

- Quick insertion from table

- If not linked : move the event in the current page.
- If linked : it creates a shortcut in the current page.



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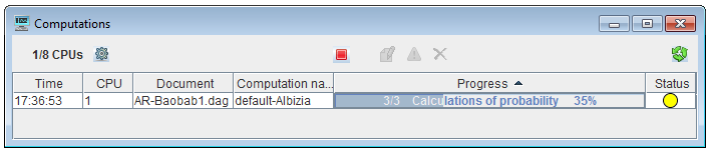
GRIF BOOLEAN MODULES 2016

PROGRESS BAR

- Progress bar for calculation



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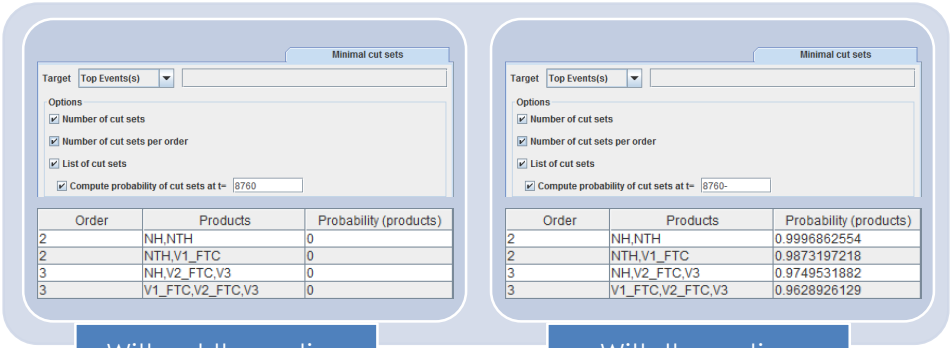
GRIF BOOLEAN MODULES 2016

CALCULATION BEFORE TEST PERIOD

- To calculate cut sets just before a test point



Without the option

With the option

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CALCULATION BEFORE TEST PERIOD

- To calculate probability just before a test point

Computation times

Automatic list of points between 0 and 17520-

Iterate From 0 To 17520 Step 730-

List of times 4380-,8760-,13140-,17520-

Display discontinuity points Times in Hour(s)

Compute mean value and integral through [0, t]

U(t) A(t) W(t)

Type = U(t) , Name = Evacuation insuffisante

Time	Value
4379.999999999999	0.9998431153914135
4380	0.9874746413789256
4380.000000000001	0.9874746413789256
8759.999999999998	0.9999980349640153
8760	0
8760.000000000002	3.5527136788004978E-15
1.3139999999999998E4	0.9998431153914135
1.314E4	0.9874746413789256
1.3140000000000002E4	0.9874746413789256
1.7519999999999996E4	0.9999980349640153

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DISPLAY MEAN TIMES IN RESULTS

Running Albizia computation

Importance factors | Mean times | Options

Probabilities / Frequencies | Minimal cut sets

Computation of mean times (MTTF, MUT, ...)

The set of mean times values (MTTF, MUT, MDT, MTBF) and number of failures will be computed. Unavailability, UFI and CFI computation will be activated

OK Cancel Help

Probability | Products | Mean times | Results | Info

System	MTTF	MDT	MUT	MTBF	Number of failures	Total up time (h)	Total down time ...
V1 non commandée	1000	7759.18	1000	8759.18	2	2000.19	1.55E4
Rmk7	1000	7759.18	1000	8759.18	2	2000.19	1.55E4
NTH	1000	7759.18	1000	8759.18	2	2000.19	1.55E4
Evacuation insuffisante	500	8148.18	500	8648.18	2.03	1012.93	1.65E4
ER	546.9	7690.34	860.19	8550.53	2.05	1762.53	1.58E4
Rmk8	1000	7759.18	1000	8759.18	2	2000.19	1.55E4
V1_FTC	1000	3434.49	1000	4434.49	3.95	3950.85	1.36E4
Alim	520.81	7807.3	744.42	8551.72	2.05	1525.11	1.6E4
V2_Ouverte	500	8148.18	500	8648.18	2.03	1012.93	1.65E4
V3_Ouverte	500	8148.18	500	8648.18	2.03	1012.93	1.65E4
NH	1000	7759.18	1000	8759.18	2	2000.19	1.55E4
V1_Ouverte	500	8148.18	500	8648.18	2.03	1012.93	1.65E4
V3	1000	3434.49	1000	4434.49	3.95	3950.85	1.36E4
V2_FTC	1000	3434.49	1000	4434.49	3.95	3950.85	1.36E4

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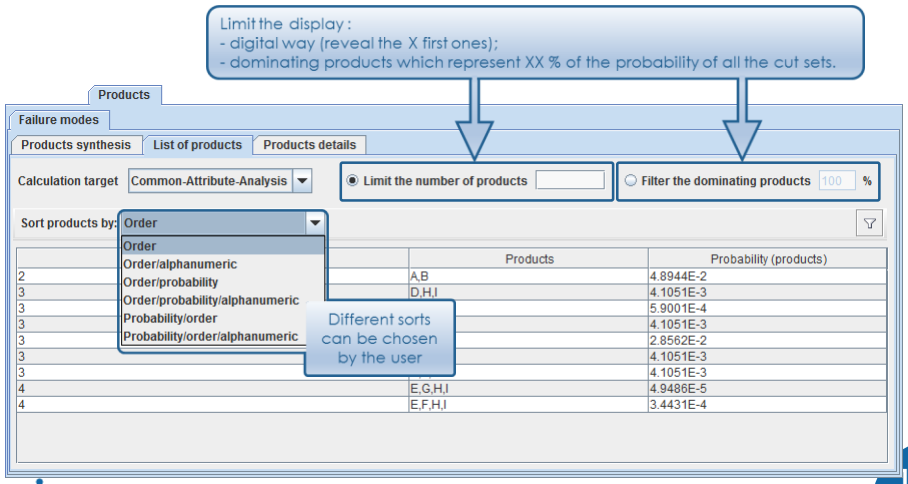
GRIF BOOLEAN MODULES 2016

NEW RESULTS TABLE FOR MINIMAL CUT SETS

- List of products



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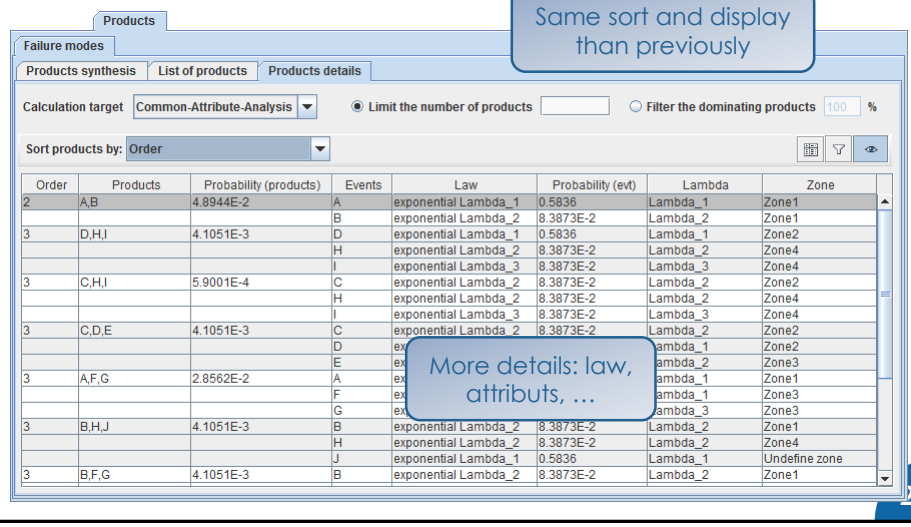
GRIF BOOLEAN MODULES 2016

NEW RESULTS TABLE FOR MINIMAL CUT SETS

- Products details



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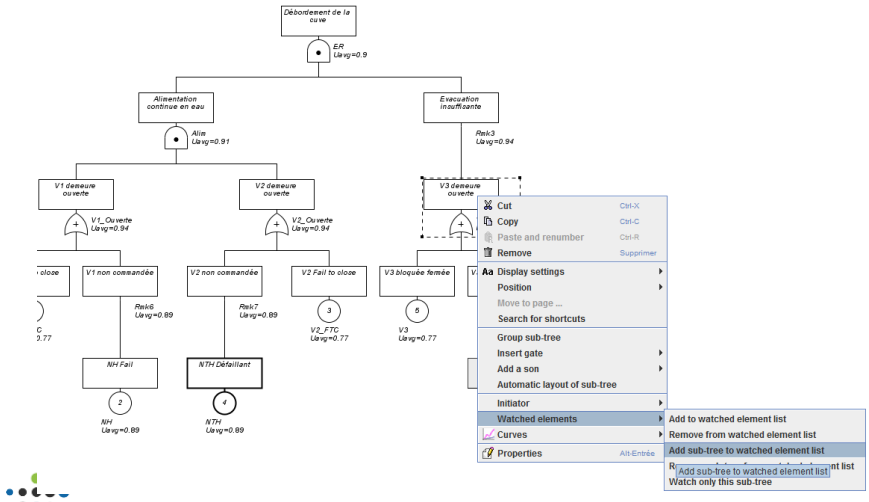
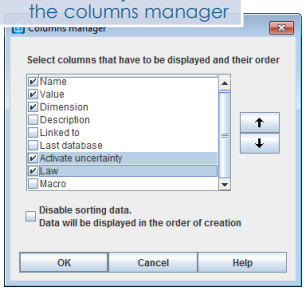
RESULTS ON WATCHED SUB-TREE

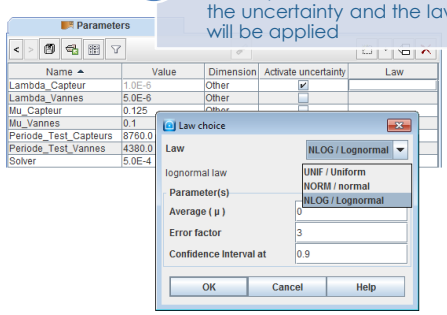


UNCERTAINTIES ON PARAMETERS

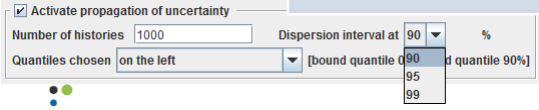
1 Select **Activate uncertainty and law** in the columns manager



2 Select parameters which the uncertainty and the law will be applied



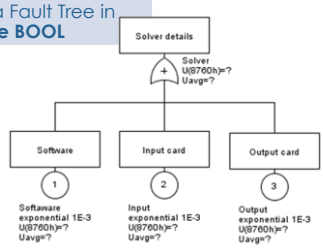
3 In the calculation menu, select the propagation



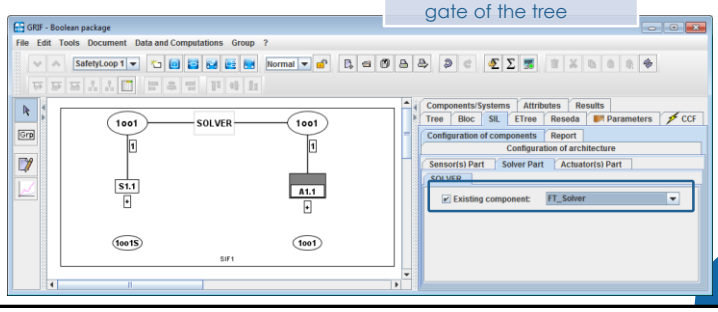
If a same parameter is used in 2 events, **the same uncertainty is considered**

LOGIC SOLVER DEFINED BY A FAULT TREE

1 Create the Solver using a Fault Tree in **module BOOL**



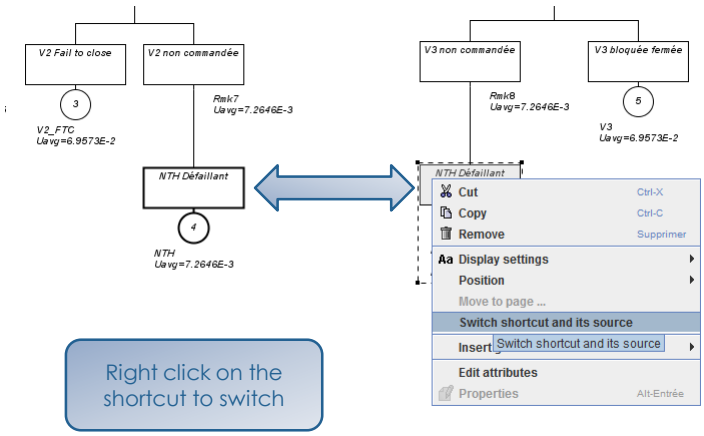
2 Create SIL loop and link the solver with the gate of the tree



BETTER INCORPORATION OF ETREE IN BOOL MODULE

- Common cause failures are now taken into account.
- Possibility to use an event as a reference component.
- Possibility to use a reference component to specify a barrier failure in case of specific law in the scenario.

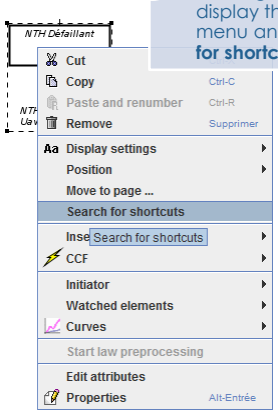
SWITCH SHORTCUT AND ITS SOURCE



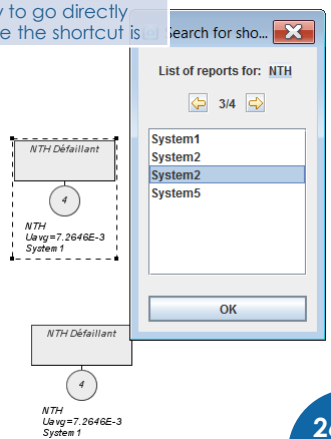
Right click on the shortcut to switch

SEARCH FOR SHORTCUTS

1 Click right on the event to display the contextual menu and select **Search for shortcuts**



2 With a click in the list allow to go directly where the shortcut is



IMPORT/EXPORT IMPROVEMENTS

- In the open PSA file export, the description field is now exported.
- Import/Export of .dag from Simtree has been improved to handle thing that are not in Simtree (new laws of GRIF, expression in parameters, parameter without dimension …)

ADD A PART OF A SCENARIO IN ETREE

- User can observe a part of a scenario (for example before adding a barrier).
- It is now possible to indicate on the link where user wants to have the results.

THE END

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