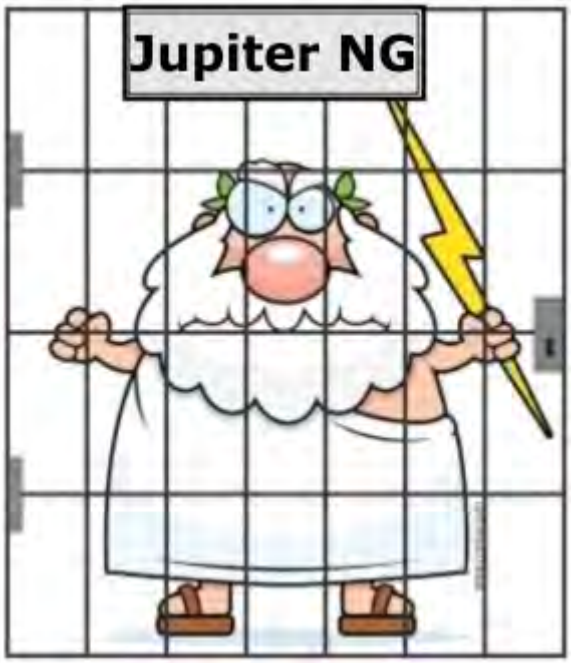
Jupiter NG 12

A Lightning Consultant



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English
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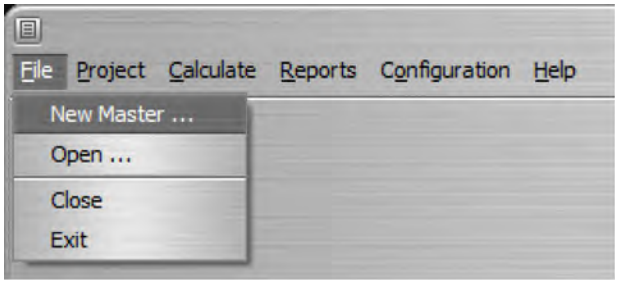
1. Menus

When starting Jupiter, we have an options menu at the top bar of the window (black arrow) and a "status" bar at the bottom of the window (red arrow):

The status bar is for information only, a reminder of the project being calculated and the standard and level of protection used.

Clicking on each option, the possible alternatives are presented:



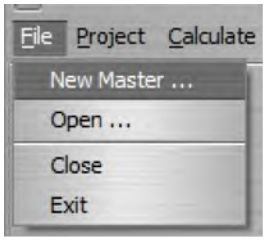
Note that, to perform some functions, it is necessary to first enter the corresponding data and follow a logical sequence - for example, do not try to generate a Report before entering the data and carrying out the respective Calculation!

2. Files

Jupiter works with "Master" files, where one or more projects are stored; Typically, you will join all the projects - buildings, structures, etc. - of the same installation in a Master file. For example, in a large factory, we will have the projects, which we will call Places: a gatehouse, an office building, a (or more) manufacturing shed (s), a warehouse, a parking lot, etc.

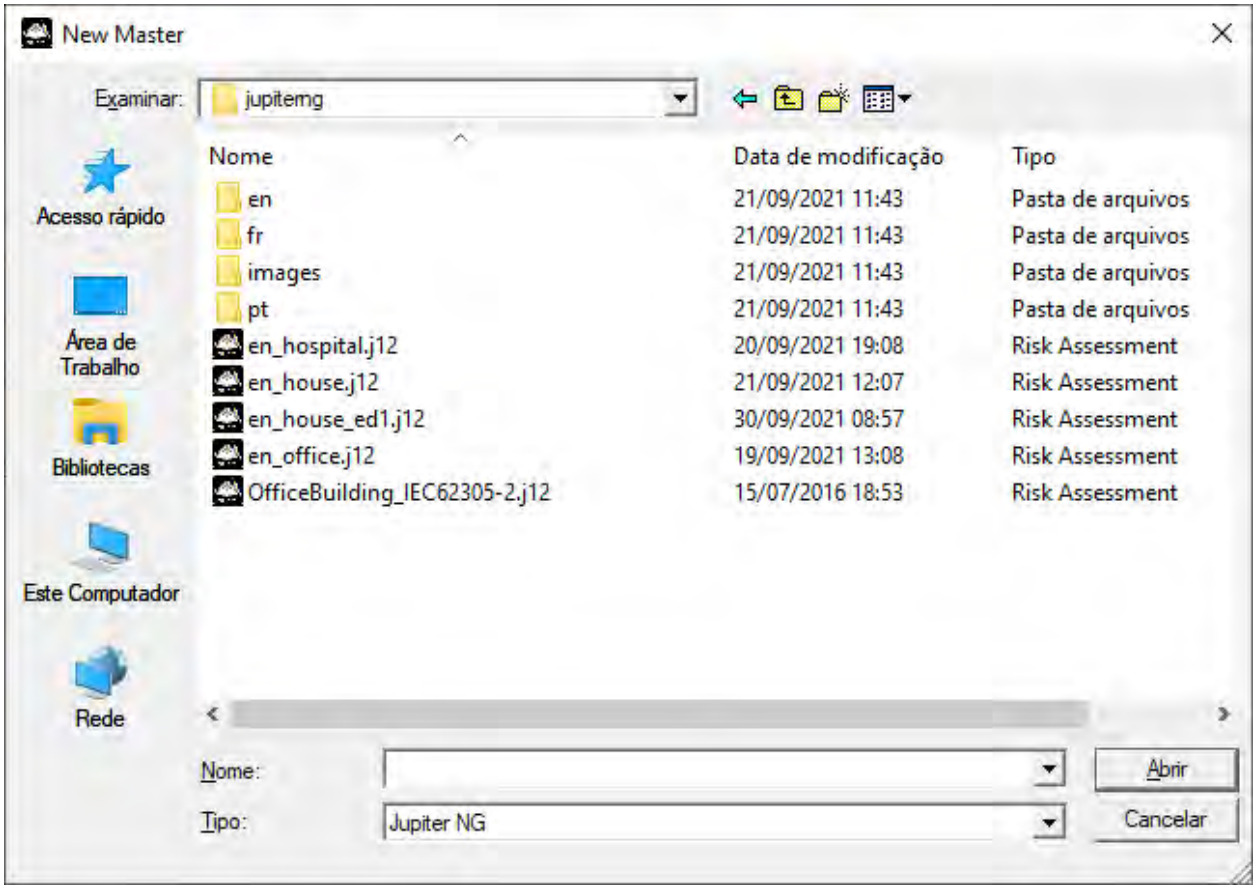
File menu options:

- New Master - start a new Master file
- Open - retrieve an existing Master file
- Close - close the current Master, remaining in Jupiter
- Exit - close the current Master (if not already closed) and close Jupiter

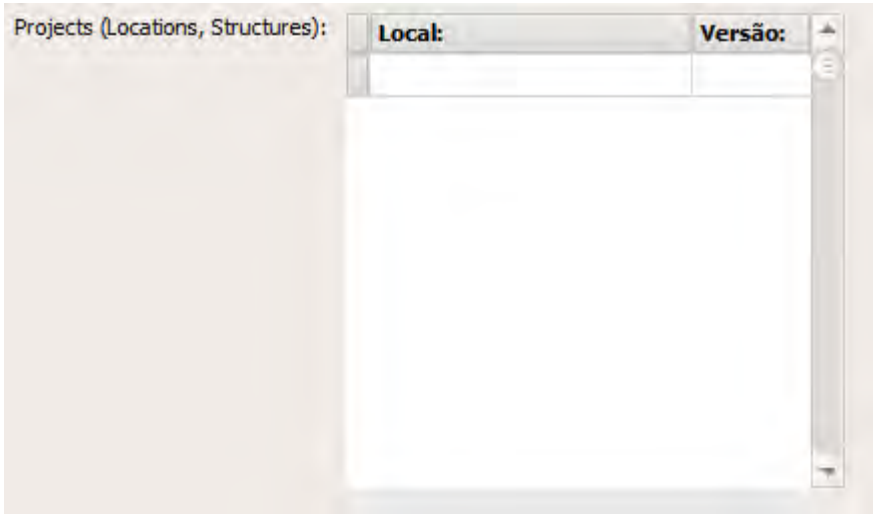


2.1 Master File

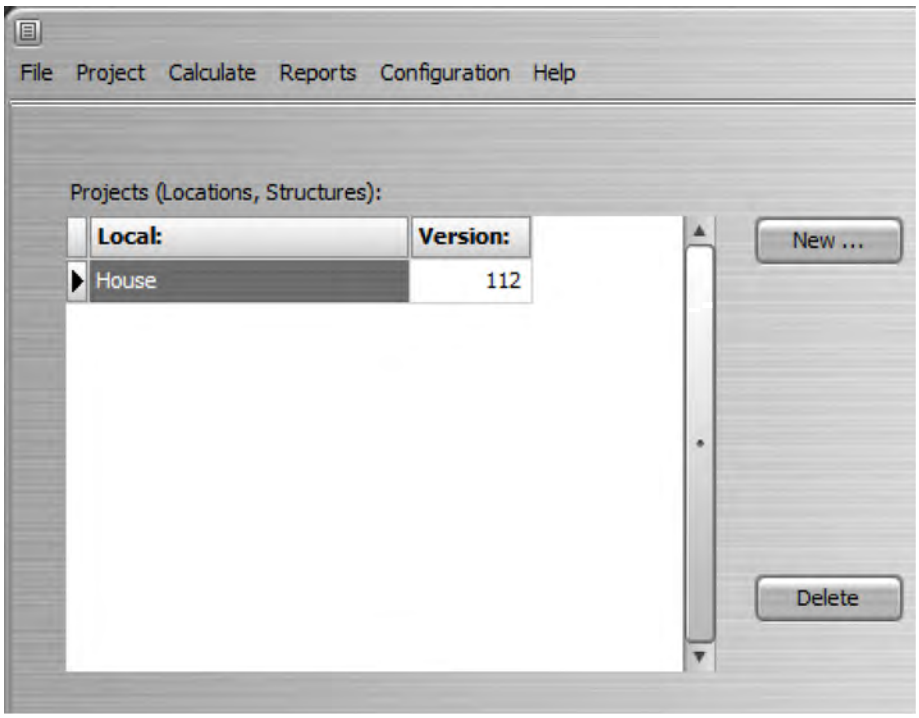
When you select New or Open, you get the file dialog:



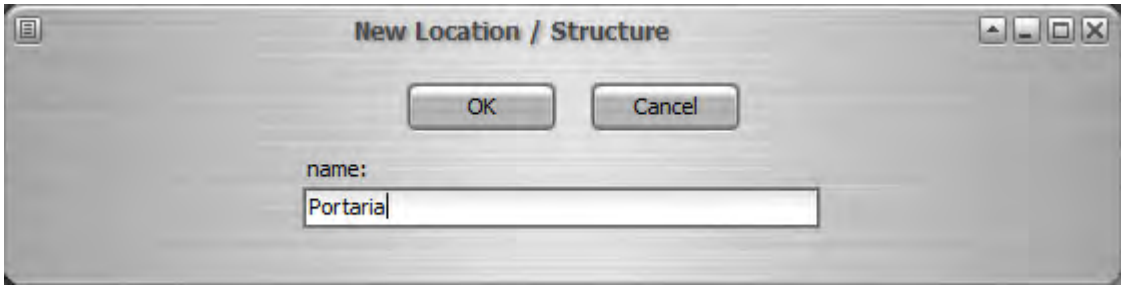
With a New file open, we have an empty Structures (projects) table:



similarly, opening an existing file, the table shows the Structures already defined:



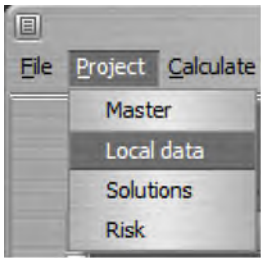
To select an existing Structure, just click on the table in the desired project; to start a new structure, click on the New button and a small window will appear where you must provide the desired name:



Thus, we have an open Structure within the Master and we can enter the data - dimensions, standard, risk parameters, etc.

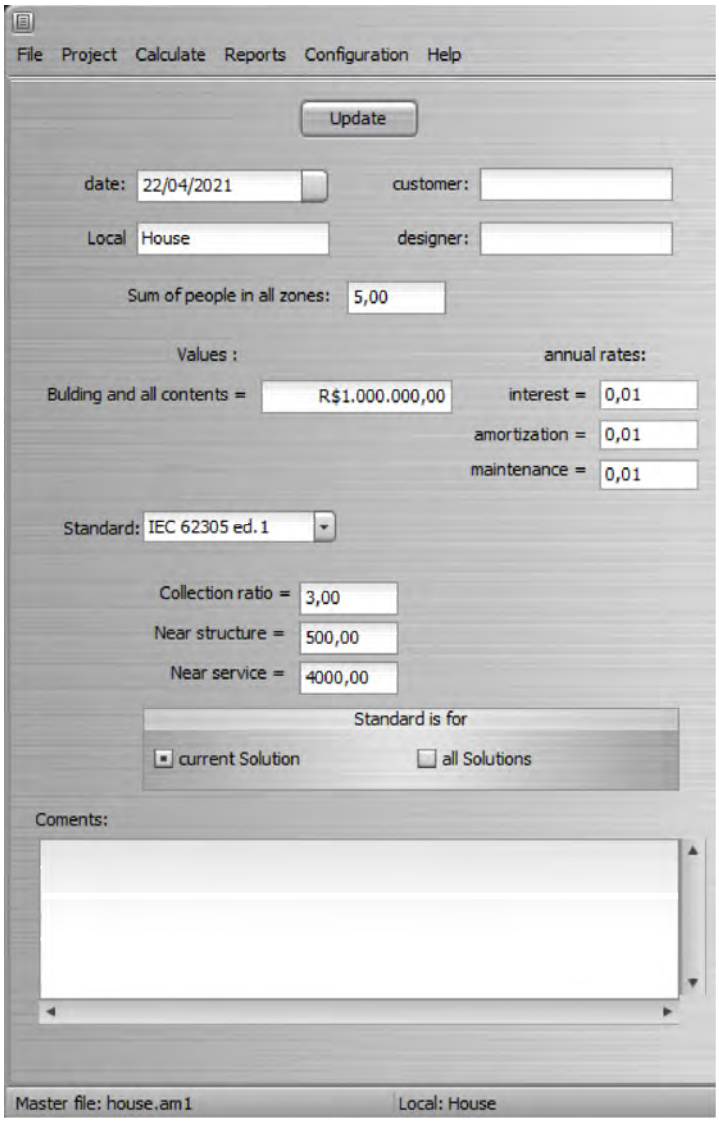
2.2 Structure Data

Select from the menu:



Enter or modify the data for this Structure:

- Project date
- Name
- Client
- Designer
- Total number of people (all zones)
- Total structure value
- Annual interest rates, amortization and maintenance
- Standard

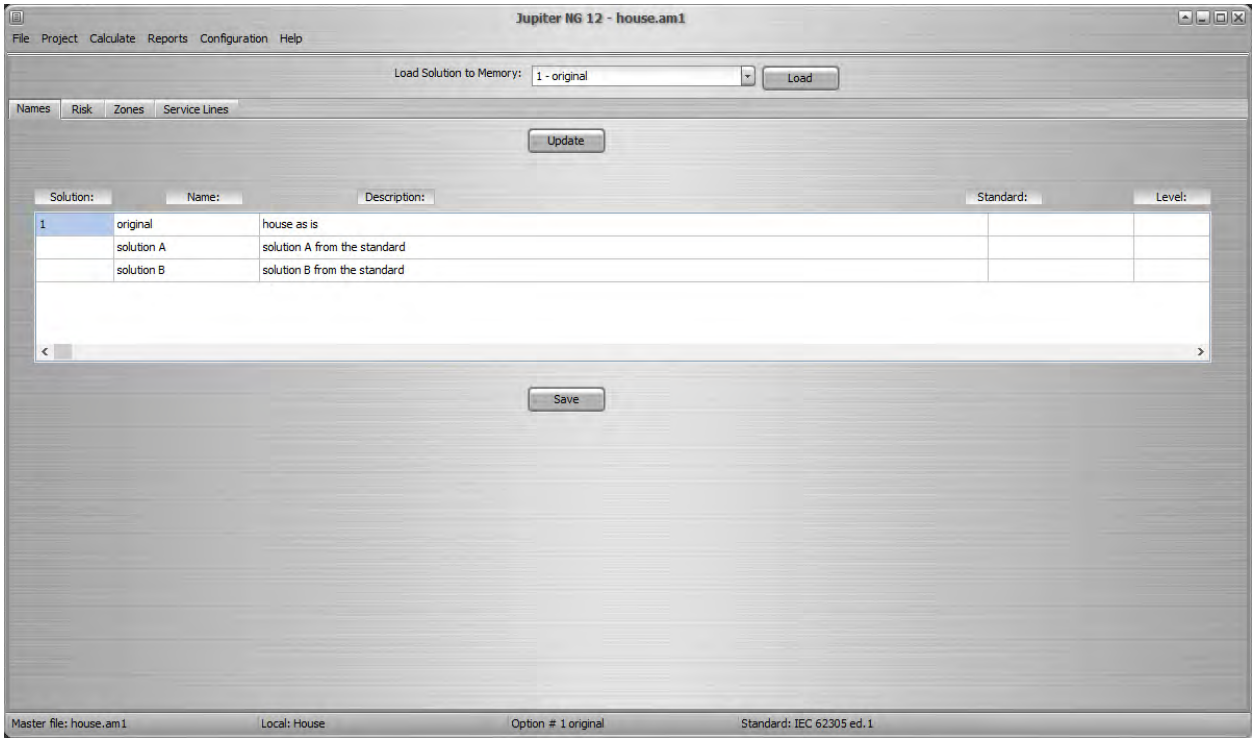


Notes:

1. standards parameters are filled in automatically
2. interest, amortization and maintenance rates must be provided in the format 0, nn - that is, 0.01 (= 1%), 0.23 (= 23%), etc.

2.3 Solutions

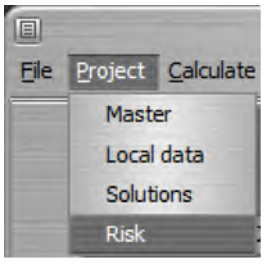
In Jupiter, the same Project (Location, Structure) can have different Solutions for comparison; for example, a different division of Zones, SPDA of different protection levels or Service Lines with different protections (SPD).



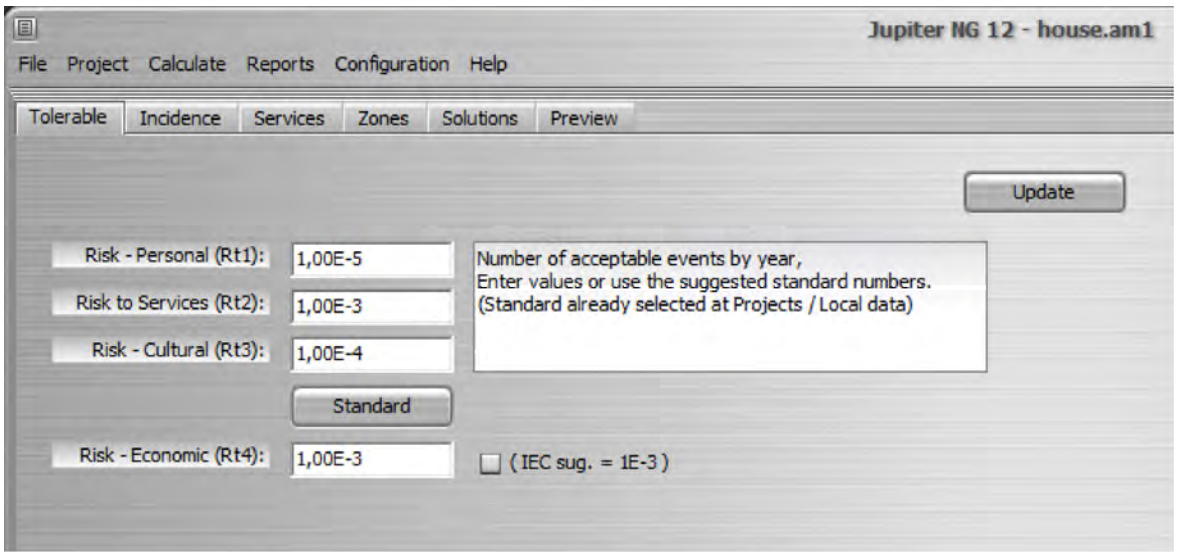
See item 3, below, how to combine these options in Solutions.

2.4 Risk data

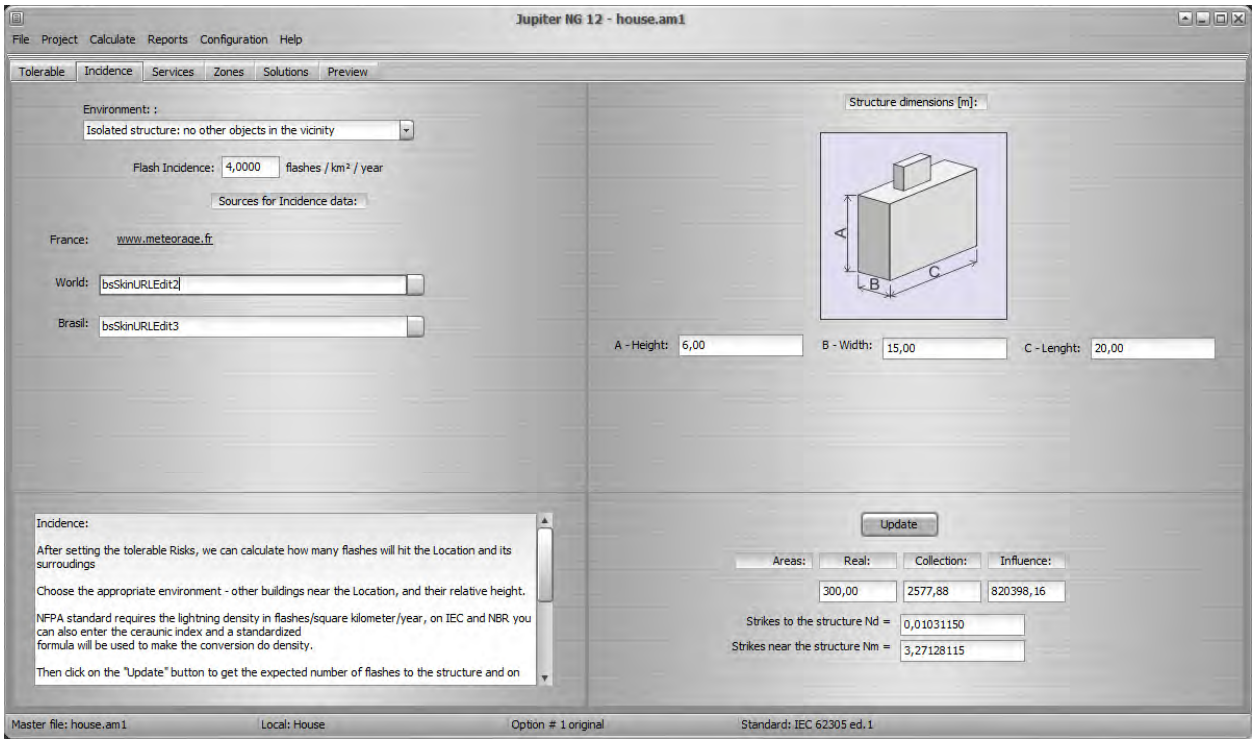
From the Menu, select Risk:



The first tab is to inform the maximum, or tolerable, risks for the project; it is possible to enter the desired values or click on Standard to obtain the risks suggested by the chosen standard:

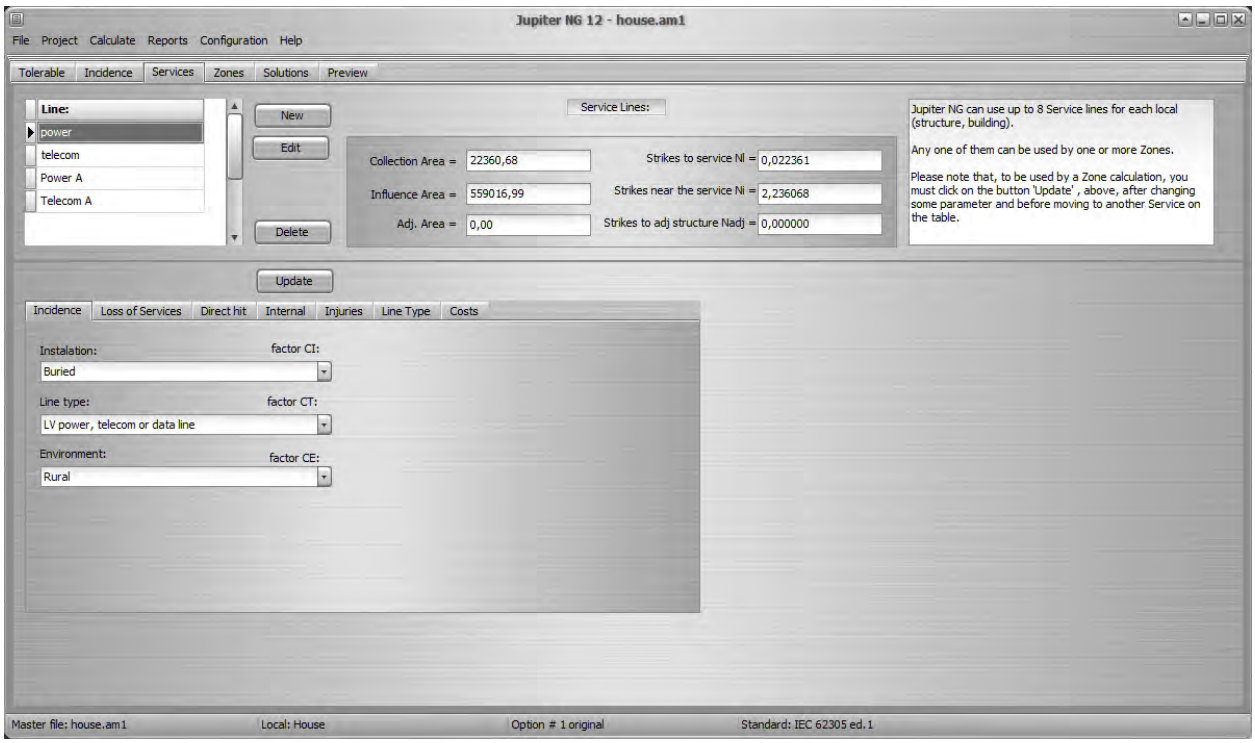


On the next tab, Incidence, choose the option for proximity and height of other structures; then enter the incidence in flashes/km²/year:



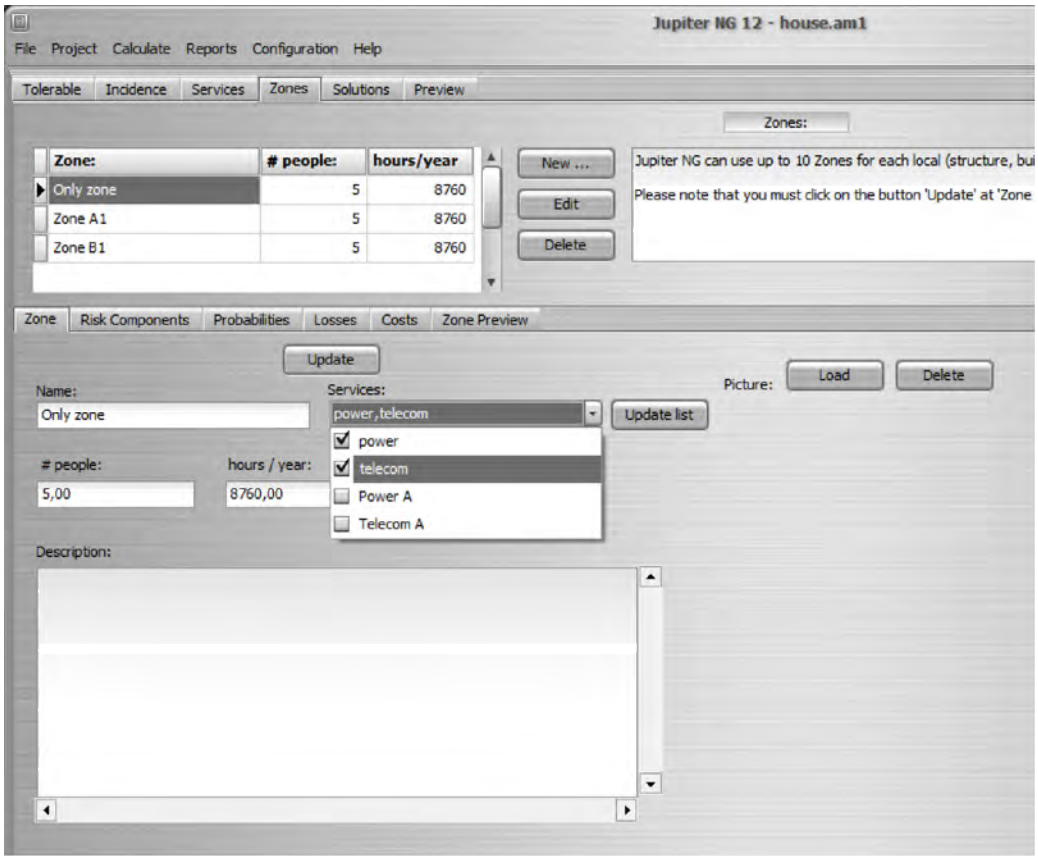
On the right side, enter the overall dimensions of the structure (Location) and click Update to get the expected incidence values for the Structure.

In the next tab, Services, up to 16 service lines can be specified, between Energy (electricity, power, light), Telecommunications (telephone, internet cable and/or TV...) or other metallic lines that can "bring" to a Structure a direct lightning strike or an induced voltage - for example, a fire water pipe or steam line.



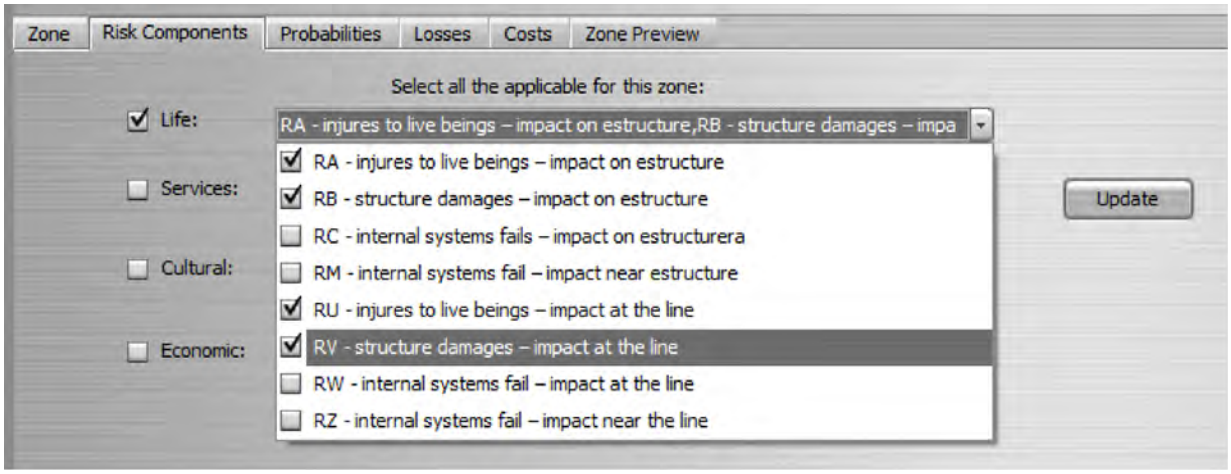
To enter each Service line, click New, provide the data and, in the tabs below, select the characteristics of the line; click Update to have the event numbers for the Service line, next to the Service and the adjacent structure (if any) calculated and stored in the file.

In the Zones tab, we can also specify up to 16 zones per Structure - note: there are 16 Zones per Structure and 16 Services per Structure, that is, Zones and Services are independent of each other but linked to the same Structure; thus, two Zones can be linked to the same Service and there can be another Zone in the same Structure with no connected Service.

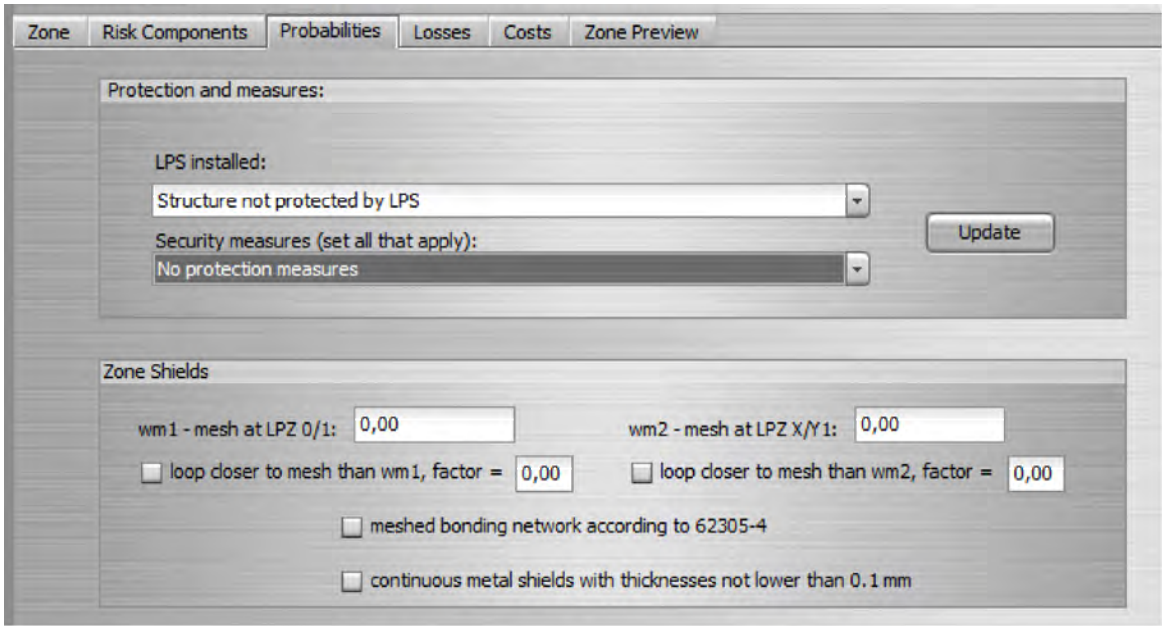


At the bottom of the screen, the general data of the Zone are shown on the first tab. To select the services for each Zone, click Update List and, in the Services box, select those that are connected to that Zone.

In the Risk Components tab, select the risks that will be considered for the Zone:



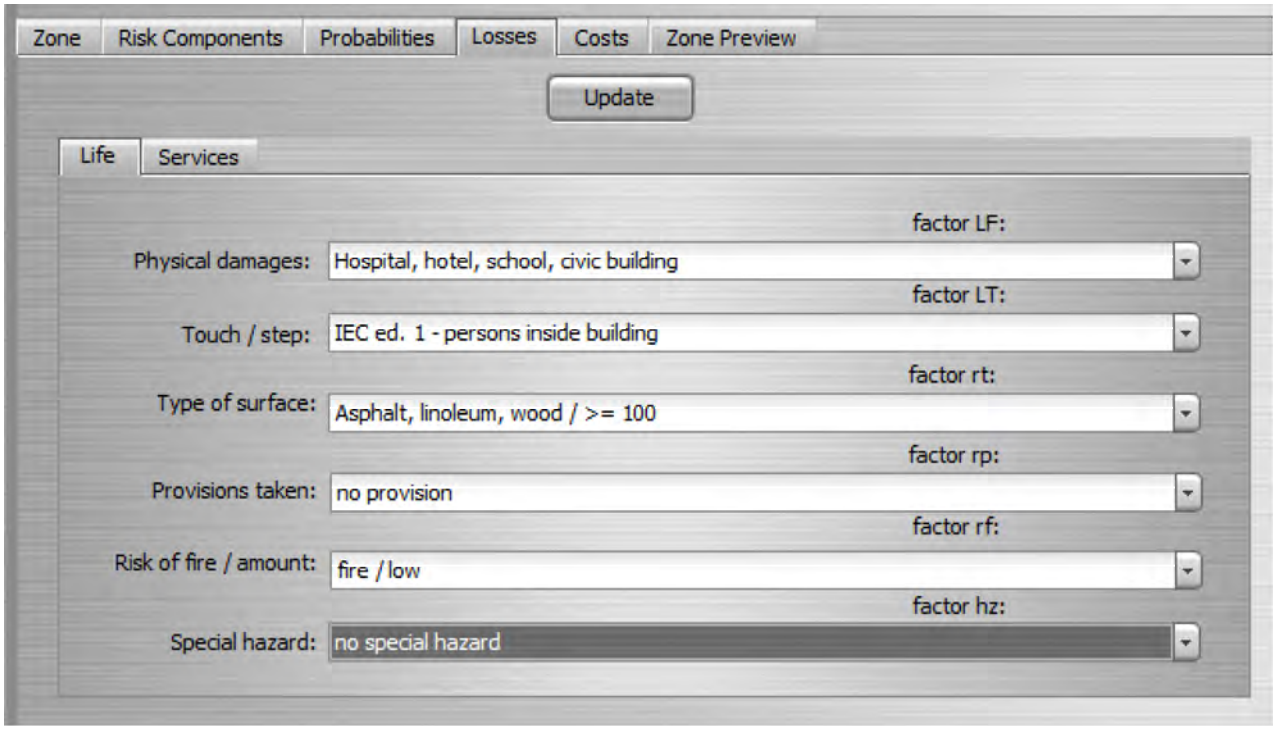
and, in the Probabilities tab, the characteristics of the installed LPS (if any) and the security measures already adopted.



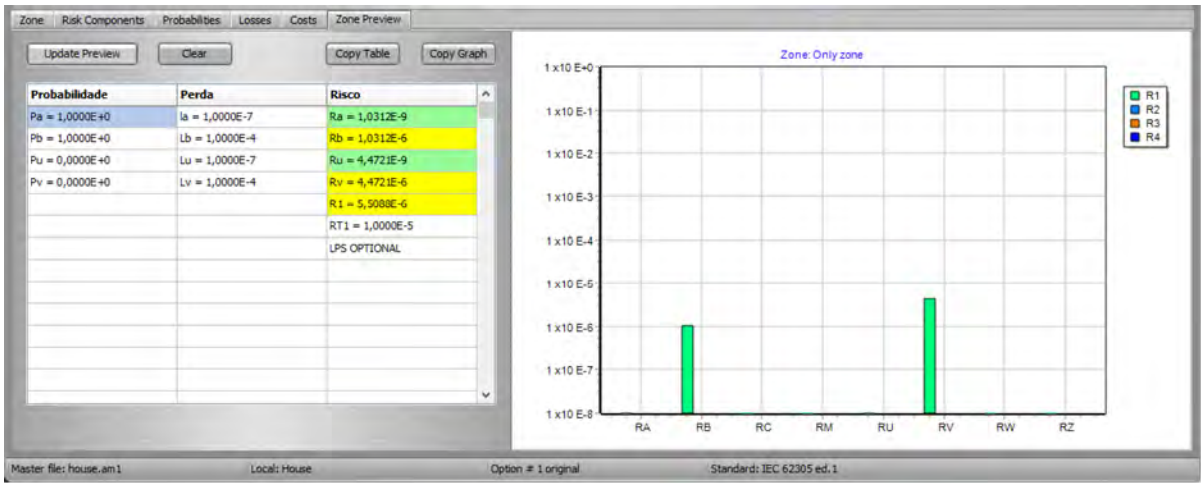
On the bottom panel, enter the shields between zones 0/1 and 1/2, if any.

Note that it is possible - and recommended - to first calculate the Site without any protection (LPS or SPD) in order to know the original situation of the Site's risks; then, you can, in the Master File, start a second Solution with the same structure as the first, but now adding the protections, that way all the alternatives and the resulting risks are filed.

In the following tab, Losses, list the requested parameters that are applicable to the Structure:



Finally, on the Preview tab, click Update to obtain the selected risks R1, R2, R3 and R4 with each applicable RA, RB, ..., RZ component:



note:

- in the table, green values are less than 10% of the corresponding tolerable risk, yellow between 10 and 100% and reds exceeded 100%; as the RA, RB, ... risks are added to obtain R1, for example, it is possible that two or three "yellow" risks generate a "red" R1.

3. Project structure

3.1 - Solutions

A Solution is a complete project, with Service Lines and Zones that form the entire Structure (Local). Generally, we choose to consider the “Original” Solution as the Structure as we found it, without adding any physical protection (SPDA) or transients (DPS), without modifying cable routes, without warnings, etc. Even if it is not - and probably will not be - protected, it provides us with a basis for analysis so that we know where it will be most efficient to intervene in the Structure to have, then, Effective and inexpensive Solutions.

3.2 - Service Lines

With the possibility of defining several Service Lines, we were able to quickly calculate Solutions for different costs and procedures, such as adopting SPD of different capacities, cables and loops, etc.

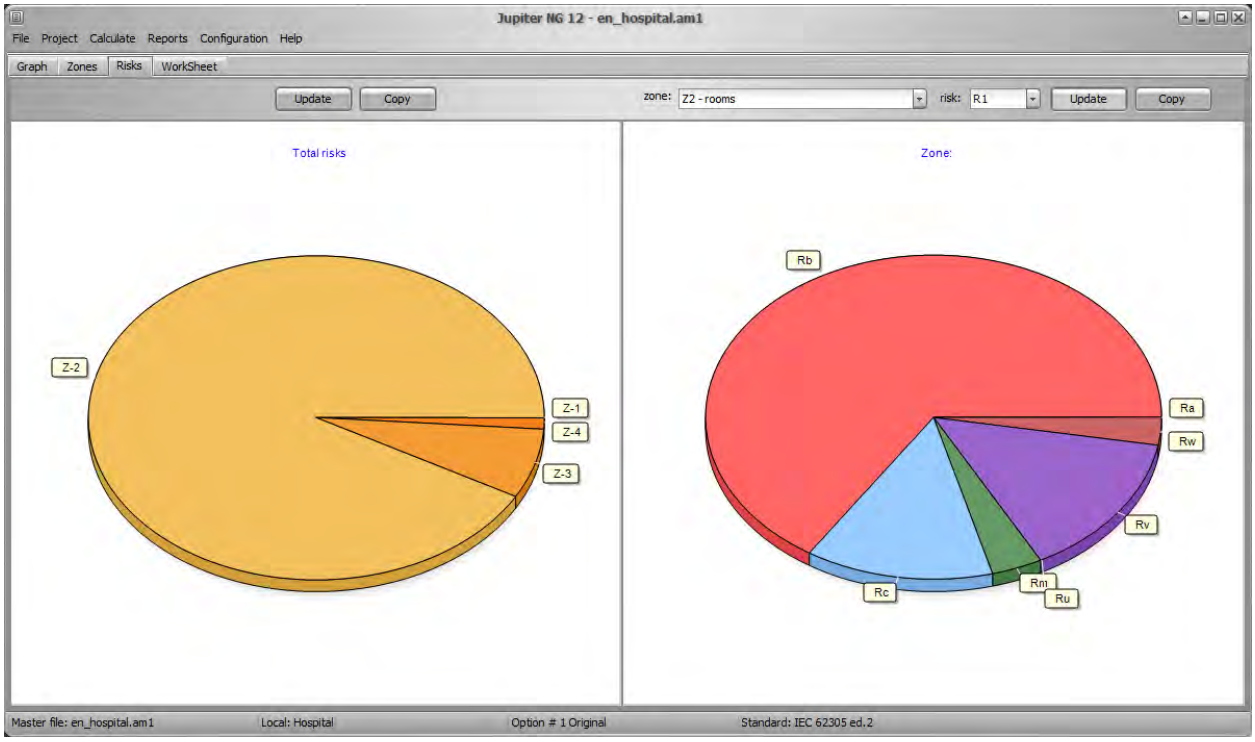
Thus, a Solution with, for example, two Zones (see below), can be connected to two Service Lines (say, Energy and Telecom) without protection, sometimes with two other versions of the same lines with SPD for protection level I or better.

3.3 - Zones

Although the Zones are defined by construction, use and occupation - that is, they do not “physically change”, we can define different options for each Zone, in order to obtain better, cheaper Solutions, etc.

For example, depending on the stage of the Structure - Project, construction or already in use - the most convenient or cheapest protection options will vary considerably, for example: the use of concrete reinforcement fittings for descents and landings of the SPDA, opt for type of floor, and adding an automatic fire-fighting system are much easier and cheaper if done during the design phase of the Structure, ensuring a cheap and safe protection, without having to interrupt the use of the building for a renovation.

In the case of the figure below, which is the example of the Hospital of the IEC standard, we see that Zone 2 (rooms) has a much greater risk than the others and, within Zone 2, it is very clear that the most efficient is to intervene in the sources risk Rb and then Rc and Rv:

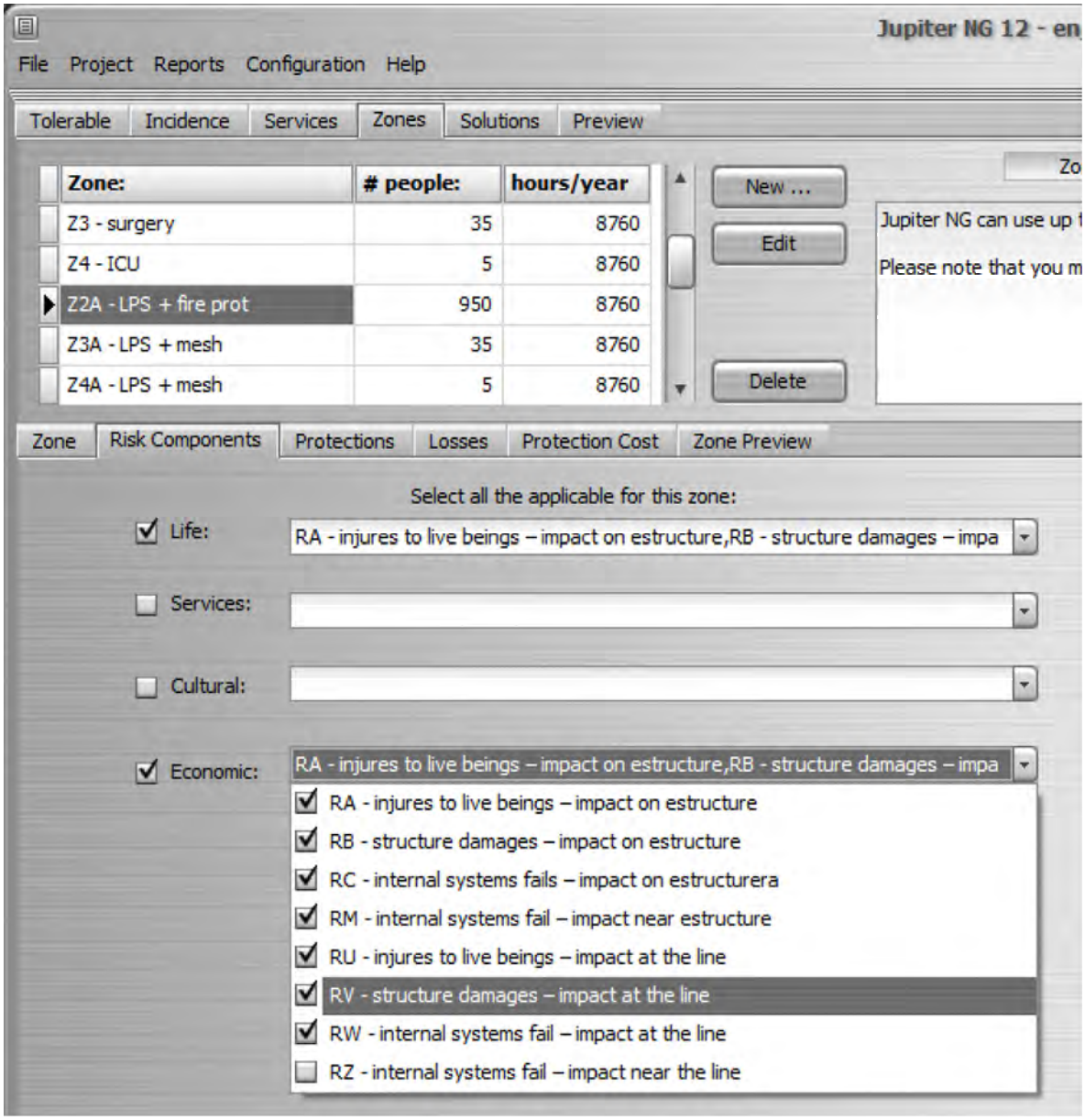


4. Costs calculations

Cost calculations and comparison in Jupiter NG are simple, we’ll need to enter the costs and financial data, perform the Risk R4 calculations, then generate the comparative report.

4.1 Risk R4

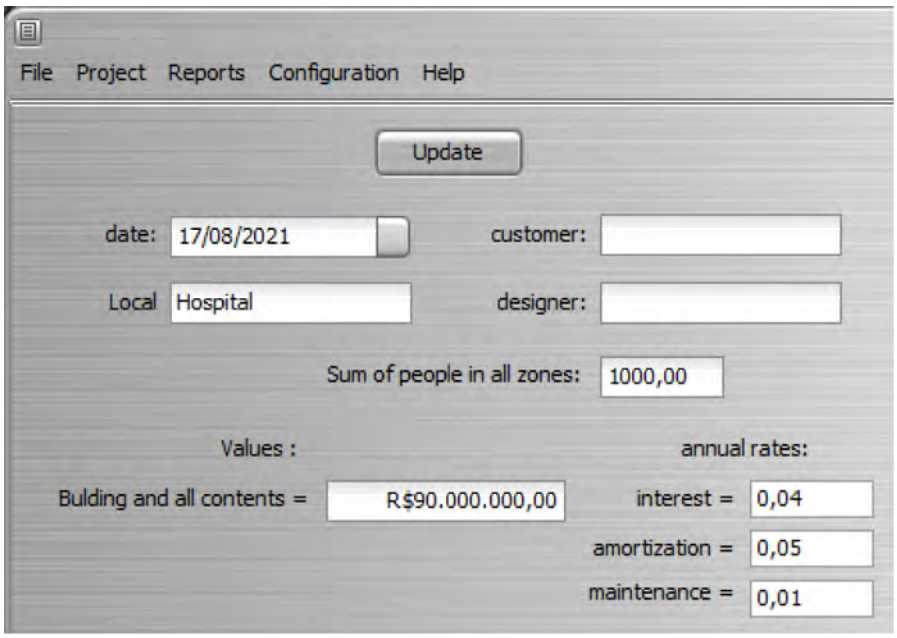
Select Risk Components for R4 as per the demands of the structure; to illustrate this item, we use the standard Hospital example, as it is the only one with comparative cost calculation.



4.2 Costs Data

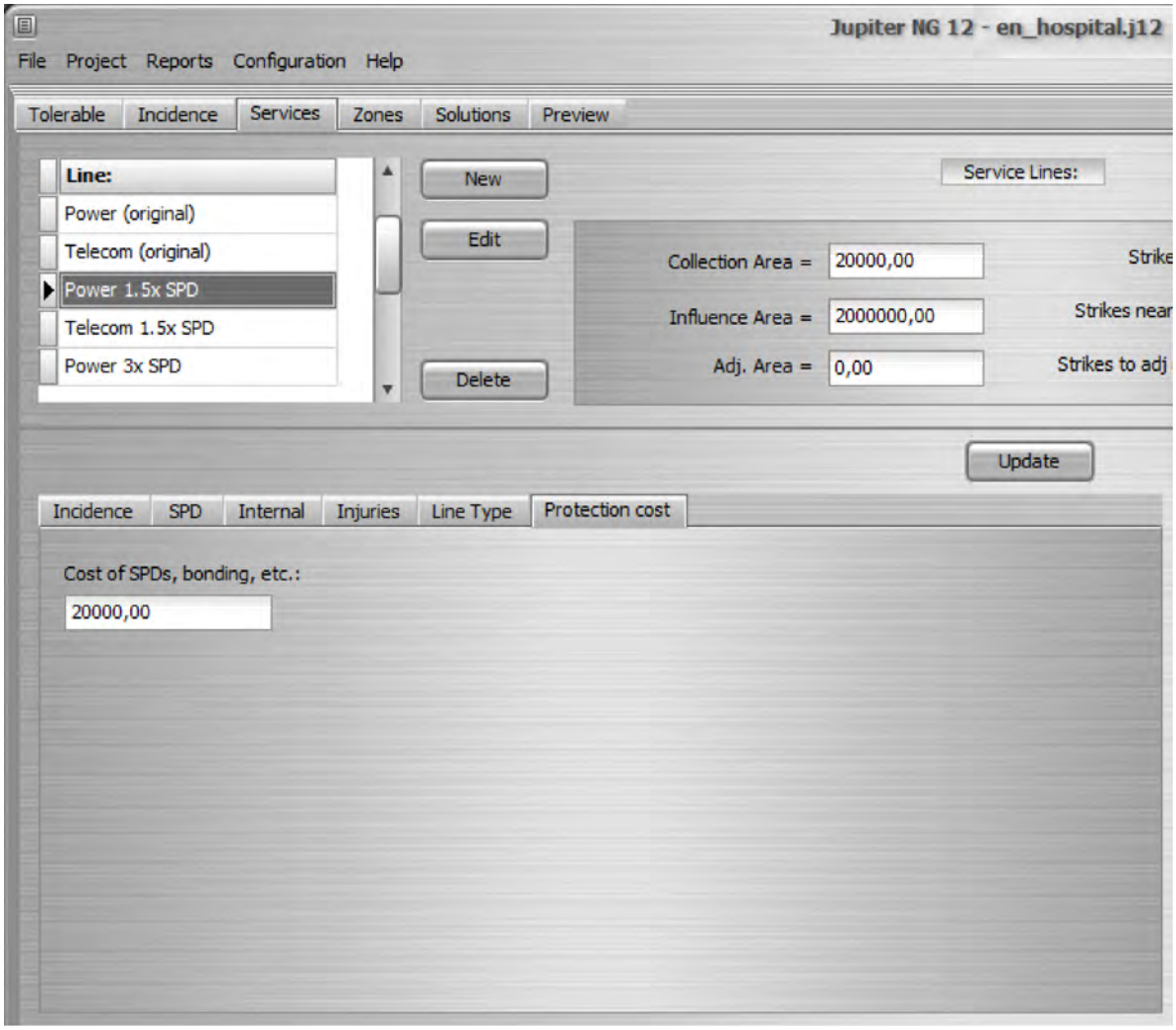
4.2.1 Total cost and financial data

On the Structure Data screen, enter the total value of the structure (including equipment, etc.) and the discount, amortization and maintenance rates. In the standard Hospital example, we have:



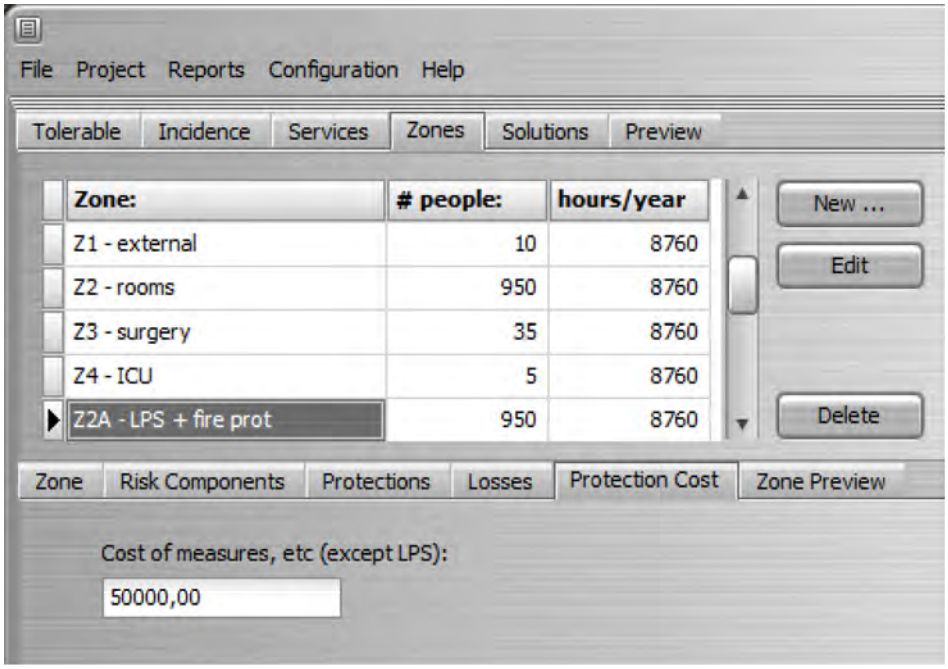
4.2.2 Costs of Structure Protection (SPDA), Zones and Service Lines

For each Service Line, enter the total cost of your protections in the "Cost of Protection" tab:



Note: Don't forget to always click the Update button when changing data (on any Jupiter NG screen), so the data is refreshed to the computer's memory and to the data file.

Similarly, enter the total cost of protection for each Zone, adding warnings, fire extinguishers, room shields, etc; continuing with the example of the Hospital, we have:



Note: in the Hospital example, the standard brings the cost of fire protection to zone 3 (Rooms), as in the figure above, but they bring a single cost for the shields in zones 4 and 5; in this example, we divide the value by 2 and put $55,000 in each zone (see Total summation below).

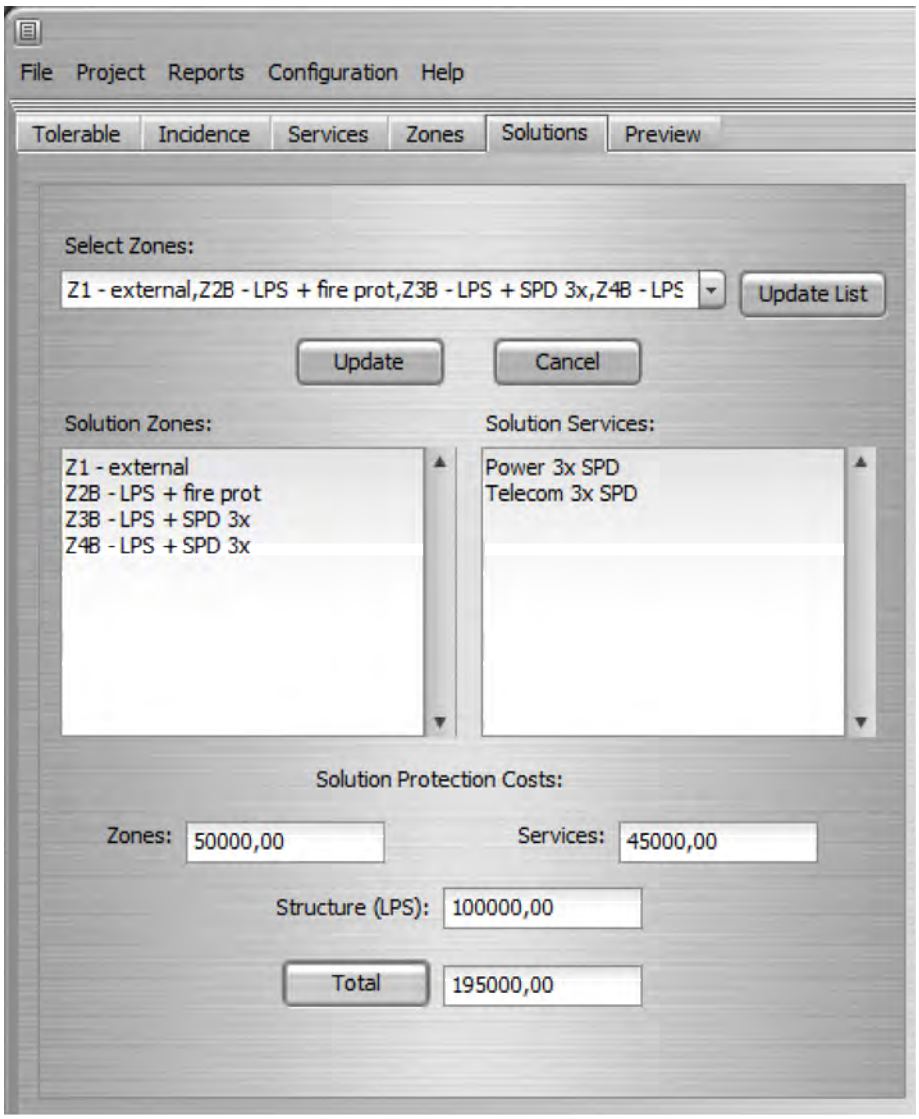
As the total cost of the LPS applies to all zones, it is provided in the Projects / Risks / Solutions tab; the sequence is simple:

- click on Refresh list and select the solution zones in the top box

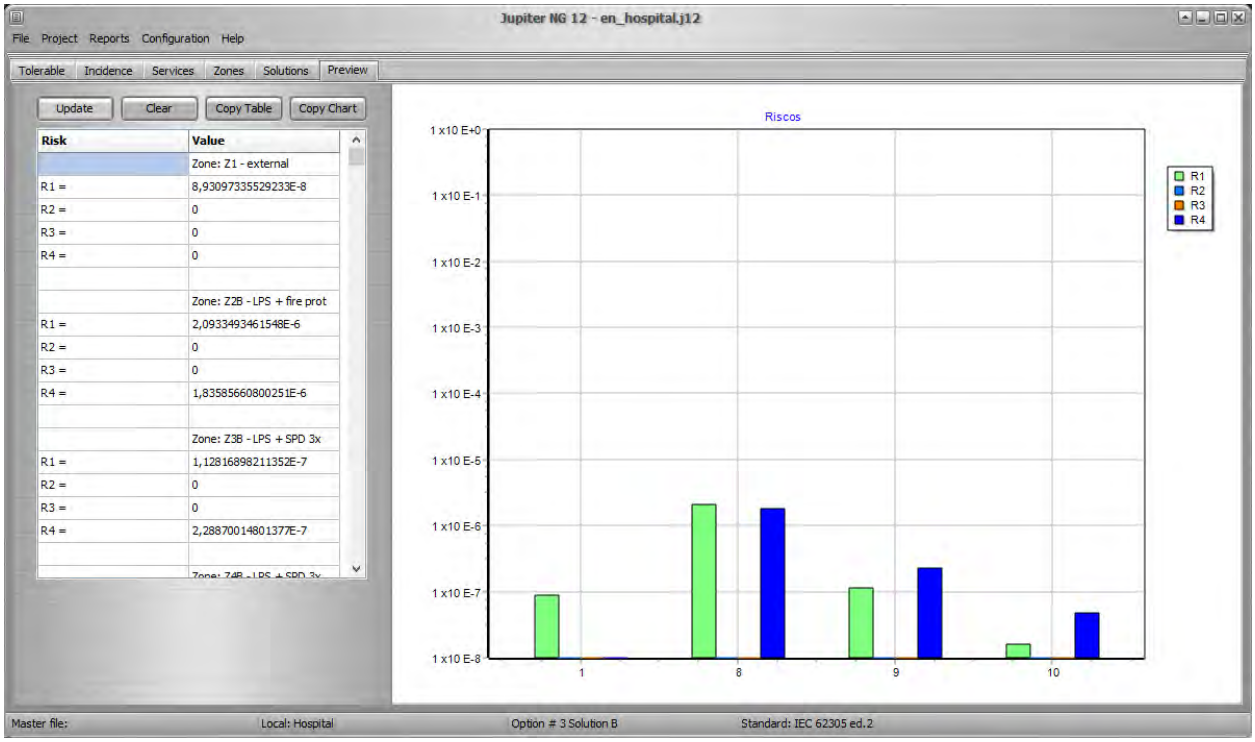
- click Update - Jupiter NG will list all Zones and Lines of Service for the Solution and add up their costs (see below for lists, Zones and Services fields)

- enter the SPDA cost for the entire building in the corresponding field and click on Total, to obtain the total cost of the Solution

For Solution B of the Hospital example, we have:



On the Preview tab, we have the risks R1 and R4:



Note: see the Hospital tutorial for the complete calculation sequence in the example.

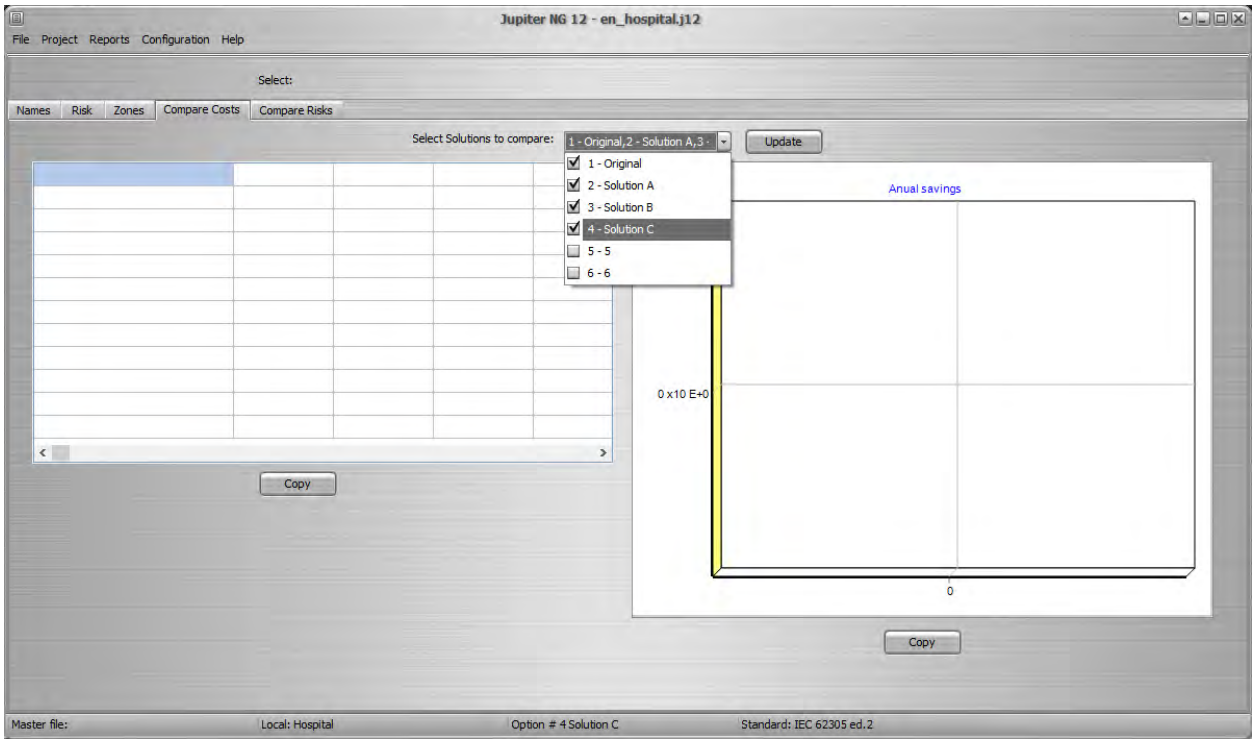
4.3 Cost comparison between solutions

Jupiter NG can, of course, only compare what has already been calculated; in the case of the Hospital, this involves:

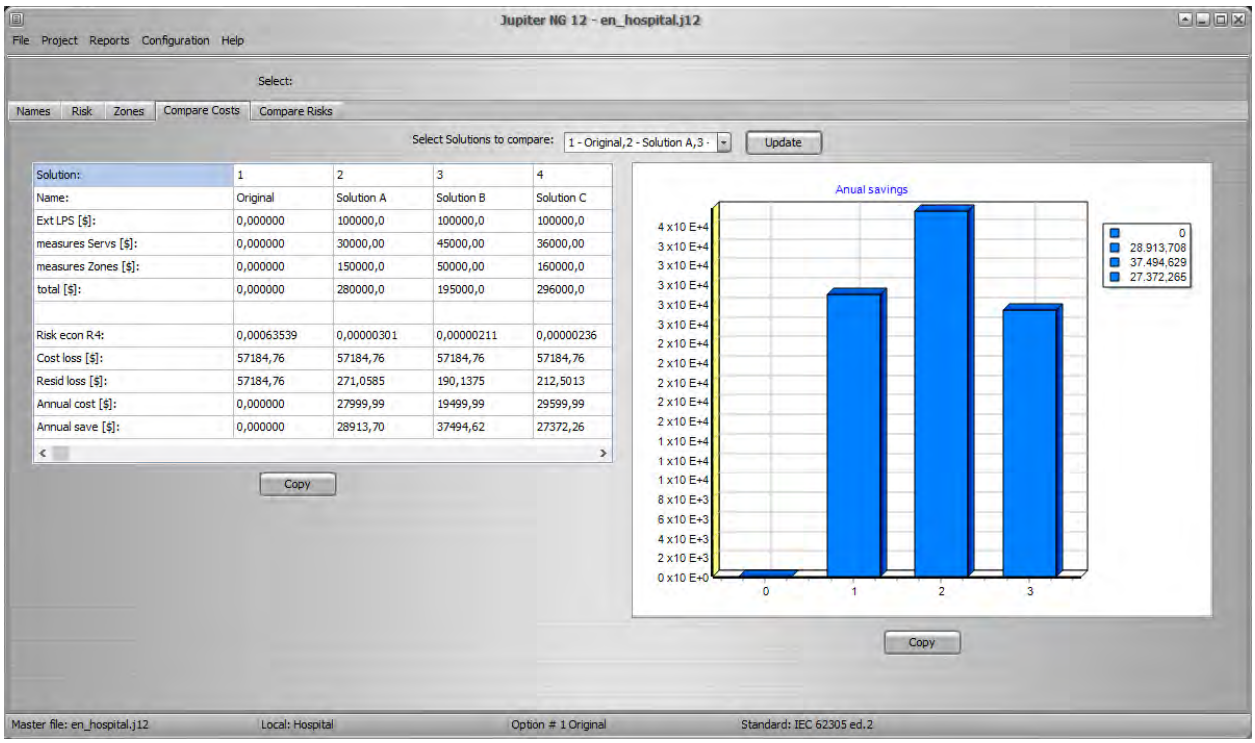
- load each solution into memory

- calculate the R4 Risks and Costs of each Solution (see above)

- finally, access the Solutions box you want to compare in the Reports / Solutions / Cost comparison menu (in this case, the Original and Solutions A, B and C):



Then click Update and the table and graph will be generated:



5. Reports

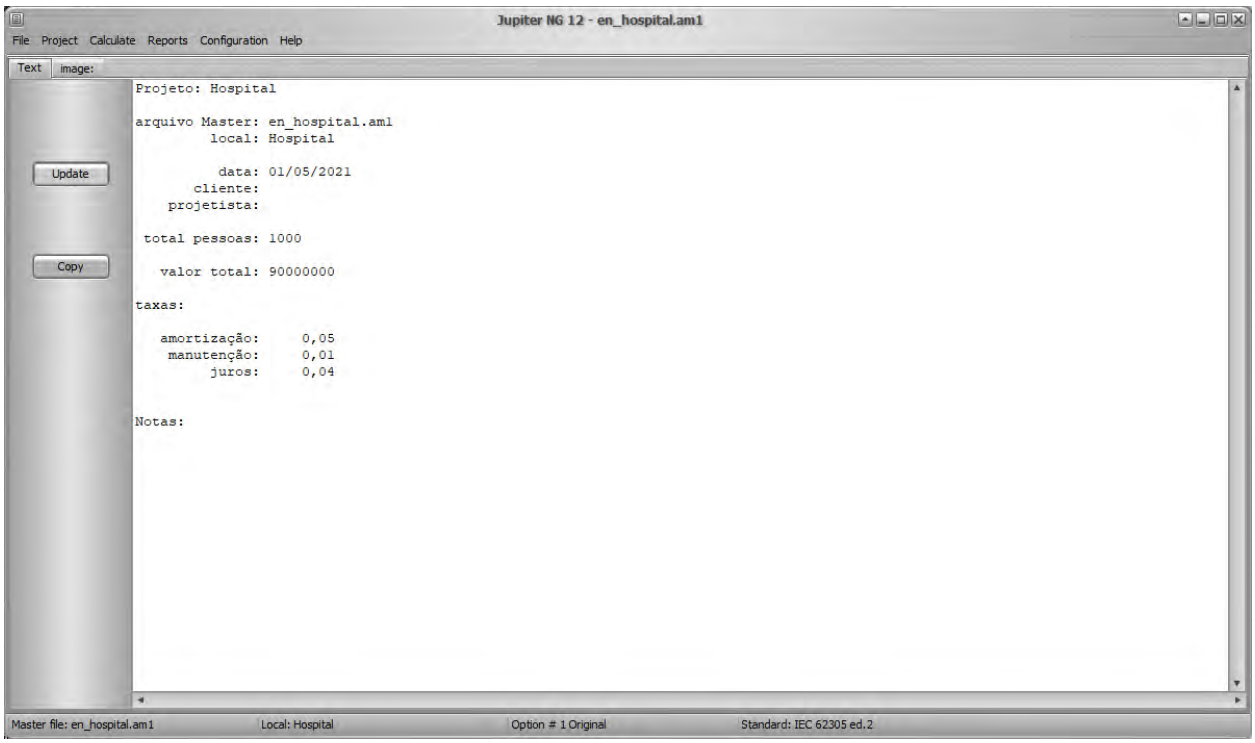
Jupiter generates reports of the data provided and the results found in the calculations; according to the selected calculation, you will find descriptive reports in Text format, a sketch (simplified drawing) of the installation and comparative graphs type bar or pie.

By clicking on the “Copy” buttons, the reports can be copied to the Windows clipboard and pasted into other programs - for example, MS Word - if desired; descriptive reports can be edited directly (click on the report and write or delete as desired).

You can also export in ".PDF" format directly from Jupiter.

5.1 Structure

These report is simple, just formatting the Structure data.

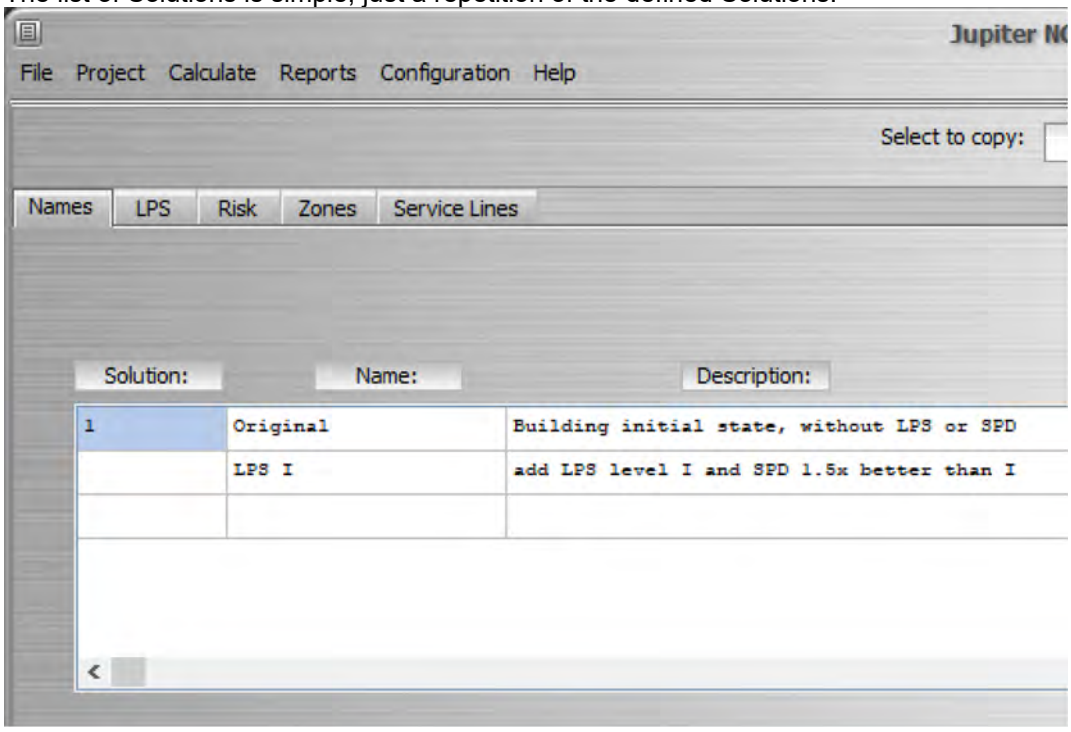


5.2 Solutions

Here we have 4 Reports:

- Solutions listing
- Zones
- Zones details
- Service Lines

The list of Solutions is simple, just a repetition of the defined Solutions:



At Risk, we have the Zones considered in each Solution:

Option:	1	2	3	4
Name:	Original	LPS I		
Zone: 1:	Z1 - outside	Z1 - outside	--	--
Zone: 2:	Z2 - rooms	--	--	--
Zone: 3:	Z3 - operatin	--	--	--
Zone: 4:	Z4 - ICU	--	--	--
Zone: 5:	--	Z2b - rooms w	--	--
Zone: 6:	--	Z3b - operati	--	--
Zone: 7:	--	Z4b - ICU w/	--	--

In Zones we have the detailed characteristics of each Zone:

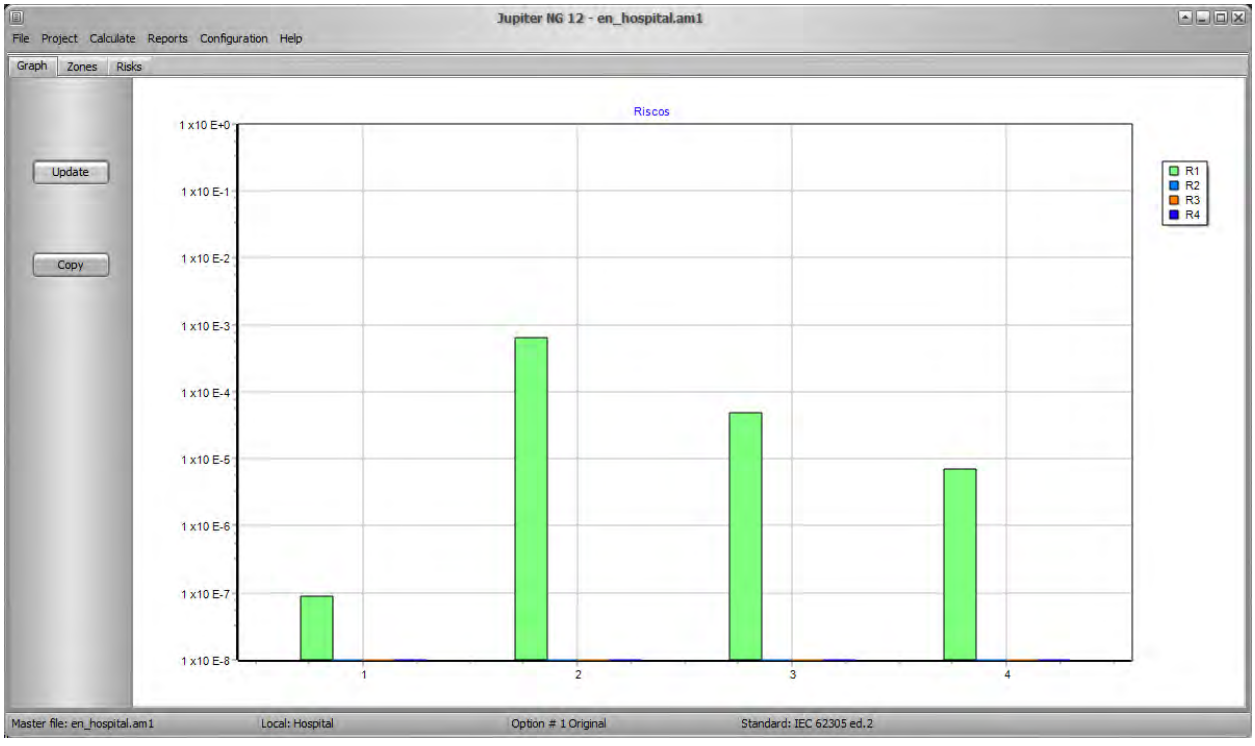
Zone:	1	2	3	4	5	6	7
Name:	Z1 - outside	Z2 - rooms	Z3 - operatin	Z4 - ICU	Z2b - rooms w	Z3b - operati	Z4b - ICU w/
Nz	10	950	35	5	950	35	5
Tz	8760	8760	8760	8760	8760	8760	8760
LPS installed:	Structure not	Structure not	Structure not	Structure not	Structure pro	Structure pro	Structure pro
Security measures							
Physical damages:	risk of explo	Hospital, hot	Hospital, hot	Hospital, hot	Hospital, hot	Hospital, hot	Hospital, hot
Internal systems:	risk of explo	Other parts o	Intensive car	Intensive car	Other parts o	Intensive car	Intensive car
Type of surface:	Agricultural,	Asphalt, lino	Asphalt, lino	Asphalt, lino	Asphalt, lino	Asphalt, lino	Asphalt, lino
Provisions taken:							
Risk of fire / amount:	none	fire / ordina	fire / low	fire / low	fire / ordina	fire / low	fire / low
Special hazard:	no special ha	Difficulty of	Difficulty of	Difficulty of	Difficulty of	Difficulty of	Difficulty of
Cultural value:	1000000	1000000	1000000	1000000	1000000	1000000	1000000
Animals value:	0	0	0	0	0	0	0
Building value:	0	70000000	2000000	1000000	70000000	2000000	1000000
Content:	0	6000000	900000	100000	6000000	900000	100000

Finally, in Service Lines, we have its detailed features:

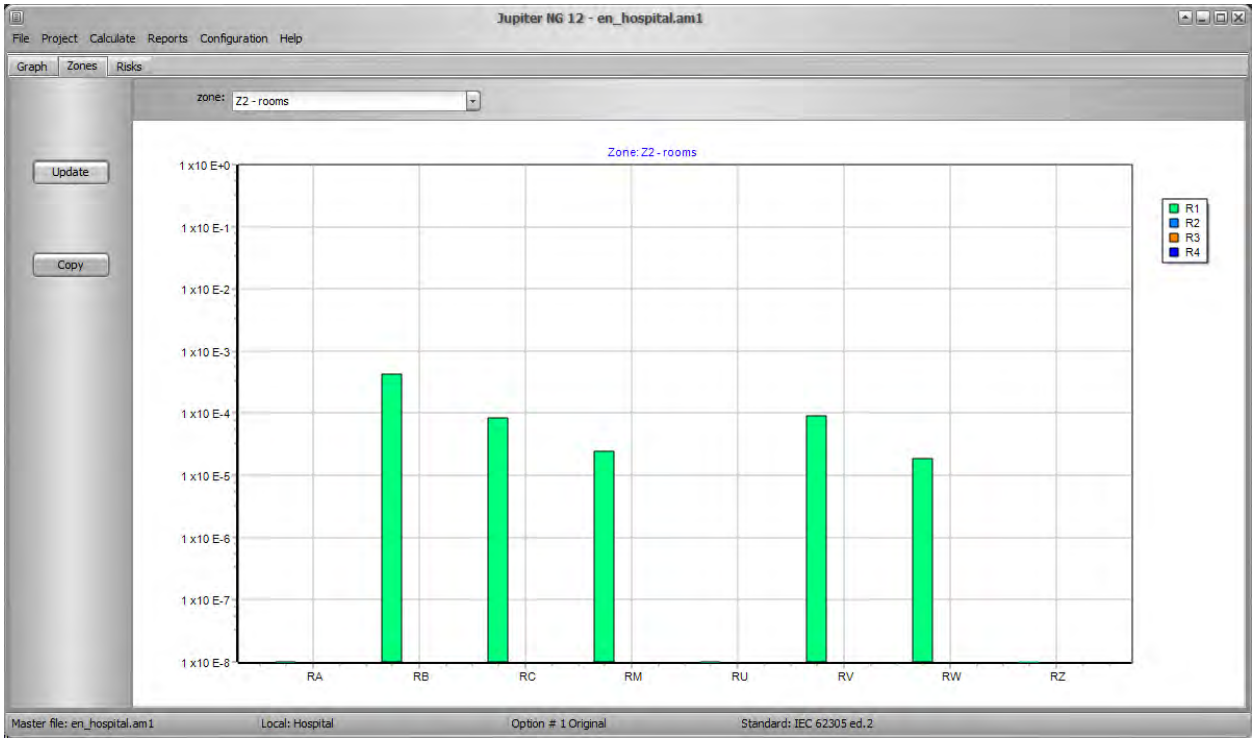
Service:	1	2	3	4
Name:	Power	Telecom	Power SPD 1.5	Telecom SPD 1
Instalation:	Buried	Buried	Buried	Buried
Line type:	HV power (wit	LV power, tel	HV power (wit	LV power, tel
Environment:	Suburban	Suburban	Suburban	Suburban
physical damage LF:	Gas, water,	TV, telecommu	Gas, water,	TV, telecommu
failure of internal systems	Gas, water,	TV, telecommu	Gas, water,	TV, telecommu
External line type / Connec	Shielded buri	Shielded buri	Shielded buri	Shielded buri
SPD:	No coordinate	No coordinate	Other, lower	Other, lower
Type of internal wiring:	Unshielded ca	Unshielded ca	Unshielded ca	Unshielded ca
Withstand voltage Uw:	25	15	25	15
Protection measures:				
Protection level:	No SPD 1.0	No SPD 1.0	I 0.01	I 0.01
PEB for "Better than I":				
Routing, shielding. bonding	Shielded aeri	Shielded aeri	Shielded aeri	Shielded aeri
Line type:	Power line	Telecom line	Power line	Telecom line

5.3 Risks

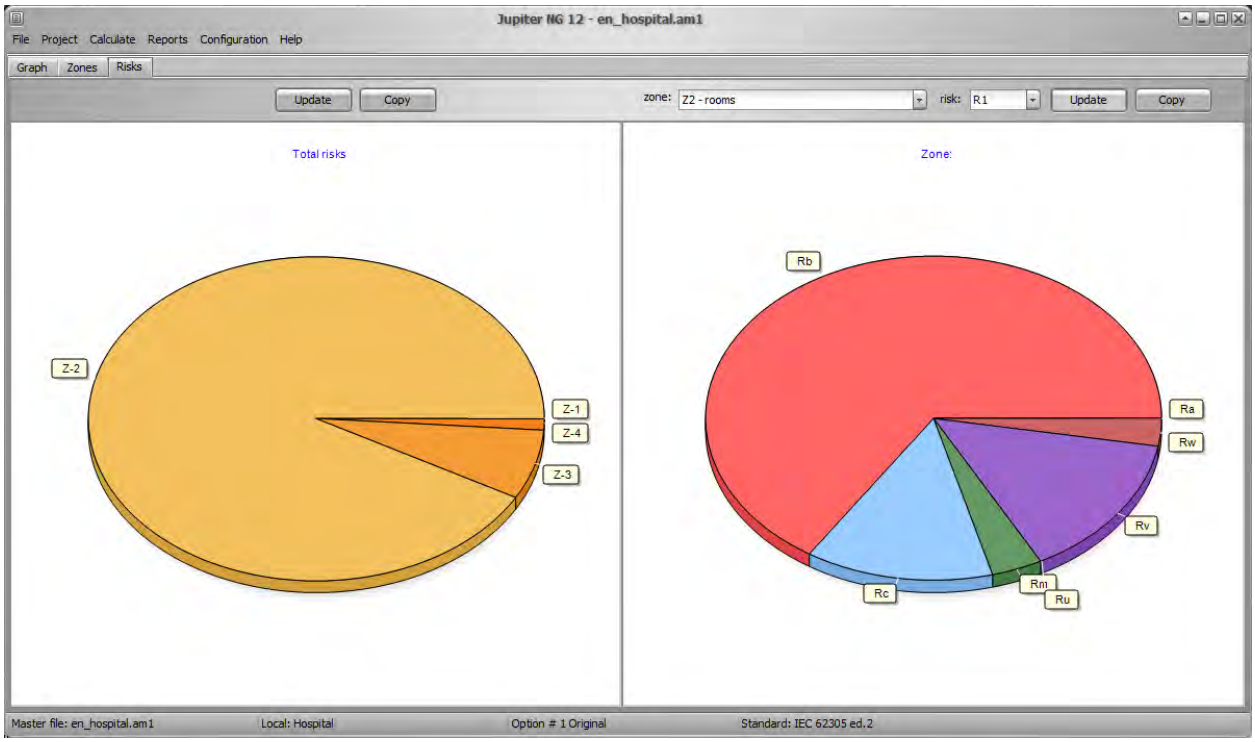
The Risk Report includes a bar graph indicating, for the risks R1, R2, R3 and R4, the value of each Zone of the current Solution, repeating in greater scale the “Preview” of the Solution:



Similarly, the Zones Report repeats, for each selected Zone, the results obtained for RA, RB, RC, RM, RU, RV, RW and Rz

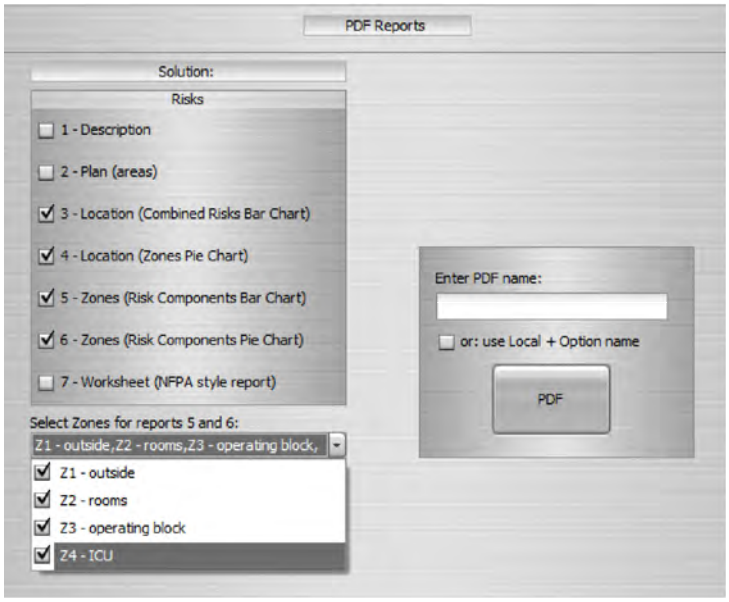


The Risk Report visually shows the proportions of Risks between the Zone, selecting a Zone, shows the distribution between the components of Risks for that Zone; this way, it is clear to the user which zones are more dangerous and which are the main components, that is, Jupiter shows graphically where it will be more efficient to adopt protective measures!



5.4 PDF

In addition to being able to copy and paste any of these reports into another program (ex: MS-Word), you can also save the reports already generated in a PDF file:



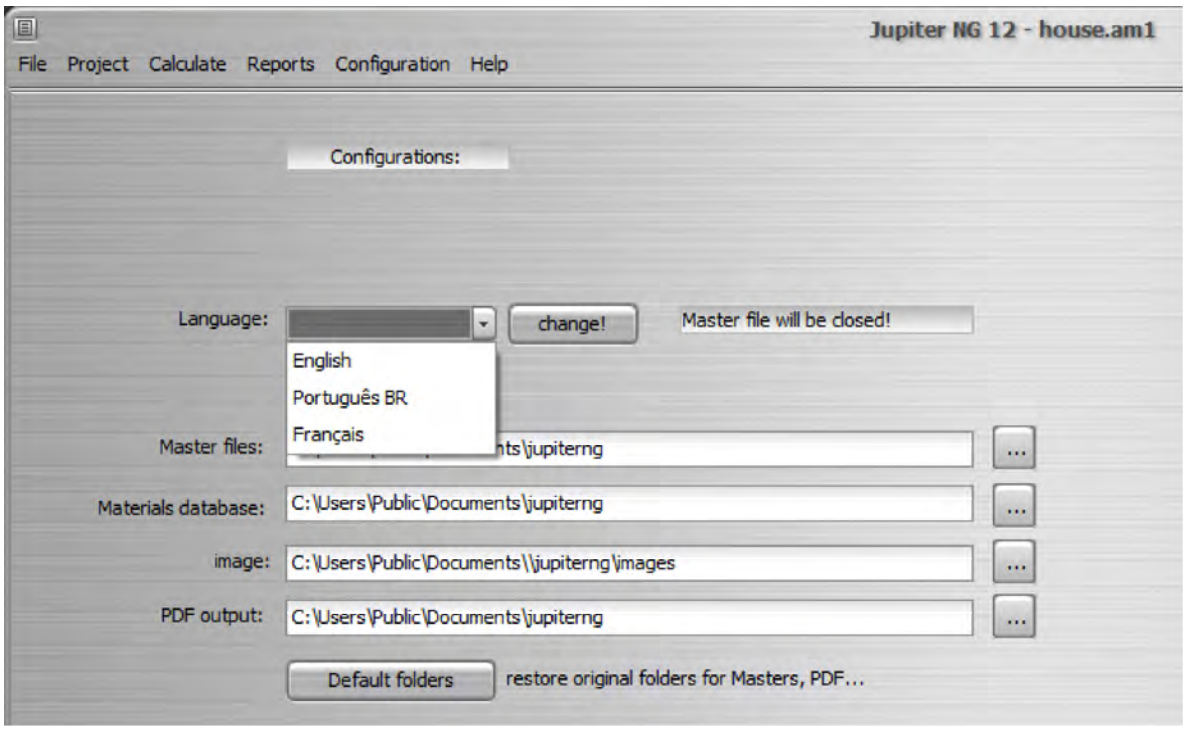
Note that the PDF Report will be saved in the current Jupiter workbook, the default is “C: \ .. \ Public Documents \ Jupiterng12”, which can be changed in the Settings.

6. Configurations

Configuration options, information about your Jupiter version and update, and support and upgrades.

6.1 Configurations

In this version, the interface language and documentation - in release 12.0 we have Brazilian Portuguese, international English and French:



Please note that when changing the Language, the Master file will be closed.

In this screen, you can also change the paths of the folders where the Jupiter data files are located, the images and also where to save the reports in PDF.

6.2 About

Informs you about your version / update of Jupiter and the links (URL) to our websites and internet support, in Brazilian Portuguese, International English and French.

When requesting support, always inform the version / update you are using, as well as the Windows version; if you are having problems in a specific case, please attach the Master file and describe the problem and what you have already done.

7. Help

Jupiter NG 12 has this Manual and Tutorials to help you use the program.

7.1 Manual

This file is the Jupiter Handbook, if you are reading this it is because you already found it !!

The Manual is a quick reference guide; for examples of projects using Jupiter, see the Tutorials.

7.2 Tutorials

The Jupiter Tutorials are commented projects of lightning protection with examples from the standard, comparing Solutions, Risks, etc.