



OPTIMISED RISK ANALYSIS

www.monarc.lu

Method Guide

CASES Luxembourg

Version 2020-06-10

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Chapter 1. Introduction

1.1. Purpose

The purpose of this document is to explain the procedures of the MONARC method by describing the various steps offered by the tool.

1.2. Other documents



- **Quick Start:** Provide a quick start with MONARC.
- **User Guide:** Complete documentation of the tool.
- **Technical Guide:** Complete technical documentation.

1.3. Syntax used in the document



All numbers in white on a red background are used on print-screen views to provide additional explanations. Explanations are always after the view with the corresponding numbering. **i.e.** 1.

Reference MONARC Reference

1.4. Syntax used in MONARC



Button that always brings up the menu.



Creating/adding something in context (assets, recommendations, etc.).



Most fields of MONARC display additional information when the pointer stay unmoved some time.



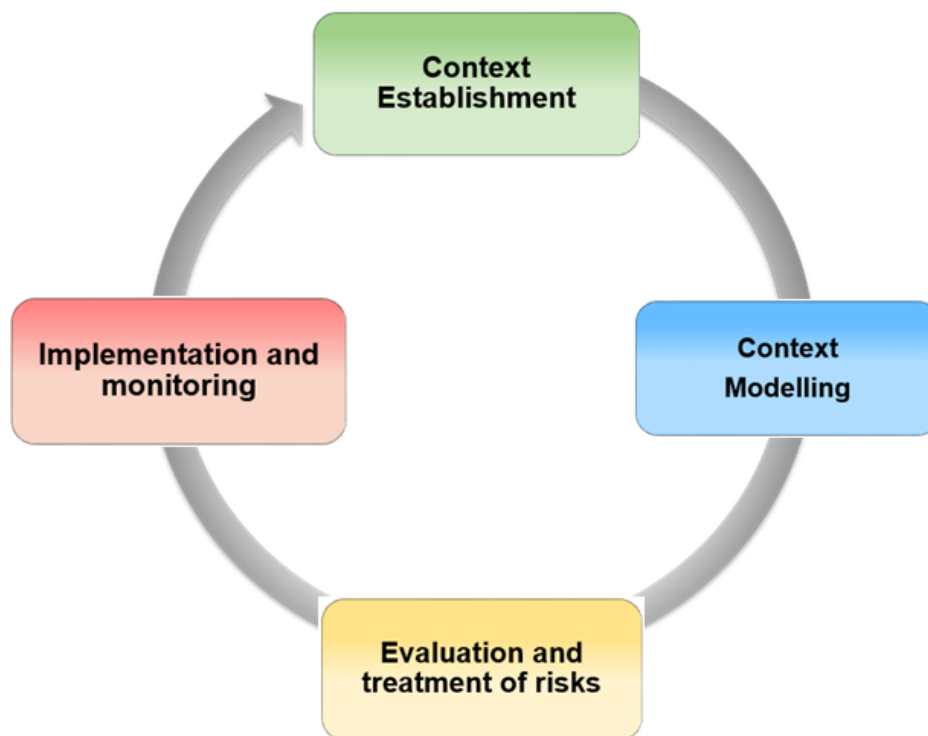
Export any table (.csv) or graphic (.png).

Chapter 2. Monarc Method

MONARC is an iterative and qualitative method of risk analysis in four stages; broadly inspired by ISO/IEC 27005.

2.1. Iterative Method

MONARC uses an iterative method which enables the pragmatic progression of risk management. This approach, as recommended by ISO 27005, enables the user to restrict himself to the essentials, then to carry out successive iterations to broaden the target or further refine it to cover more technical aspects. The optimised risk models provided as standard with the tool will enable this type of management to be carried out.



1. **Context establishment:** Definition of the target of the risk analysis, establishing and describing the context, defining the risk analysis criteria and the structure of the risk approach.
2. **Context modelling:** Development phase of the risk model. After having identified the primary assets, they just need to be broken down into support assets on a priority basis. The most common assets are present in the MONARC knowledge base and therefore identification of risk by default is offered. This type of identification may be sufficient in an initial risk iteration; however, it is the responsibility of the risk expert to provide the comprehensive model.
3. **Evaluation and treatment of risks:** Risk assessment involves establishing the level of threats and vulnerabilities of the context type under review. The processing of risk entails proposing security measures which tend to lower major risks to acceptable levels and to accept low risks.
4. **Implementation and monitoring:** The current MONARC version provides a follow-ups views in terms of the implementation of recommendations. Monitoring involves checking the major changes to the risk analysis context on a regular basis, as well as any major changes beyond said context which would imply a redesign of an analysis iteration.

2.2. Qualitative method

MONARC is a **Qualitative** method,

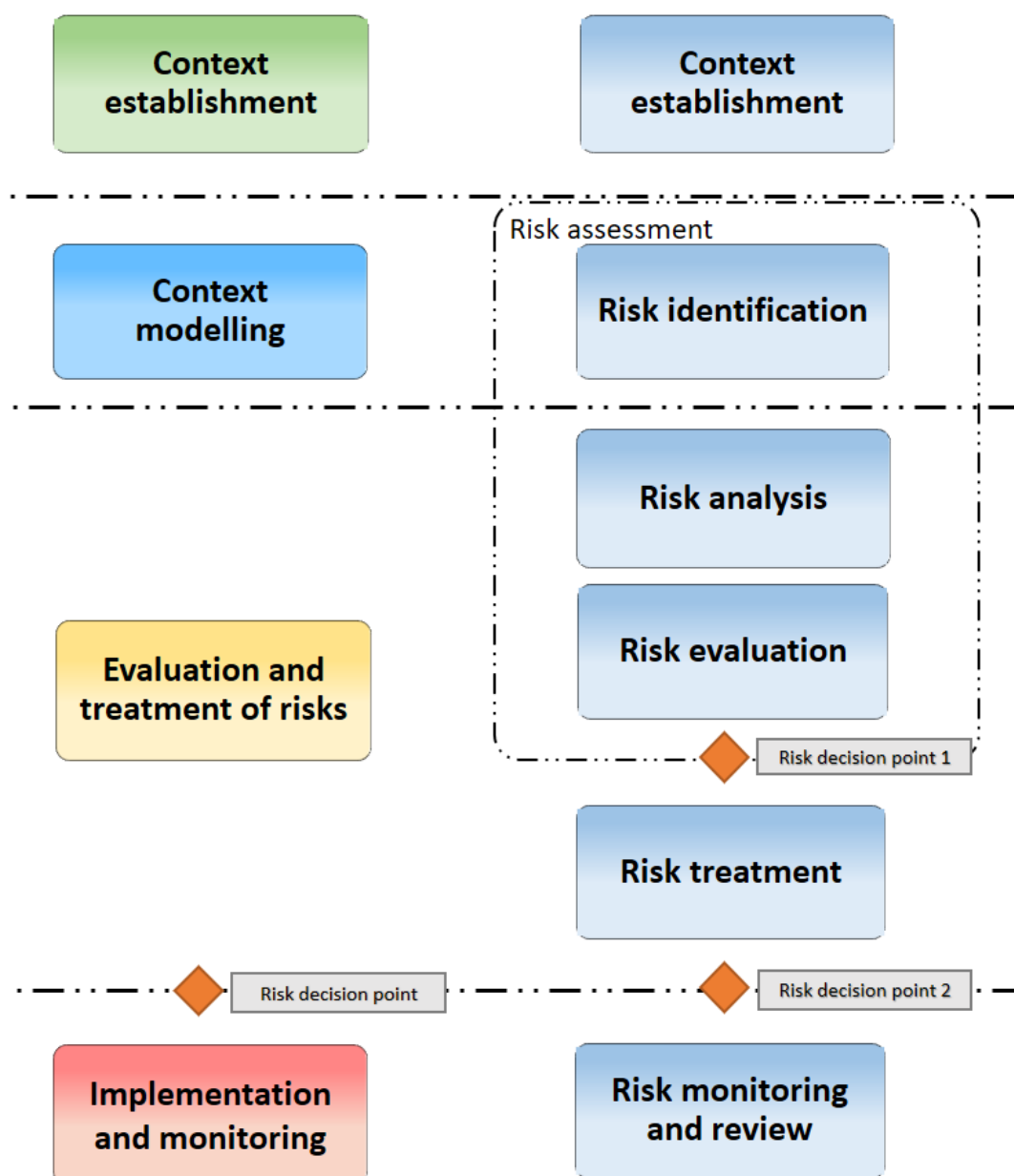


the risk parameters are determined on a contextual digital scale which enables the risks to be prioritised.

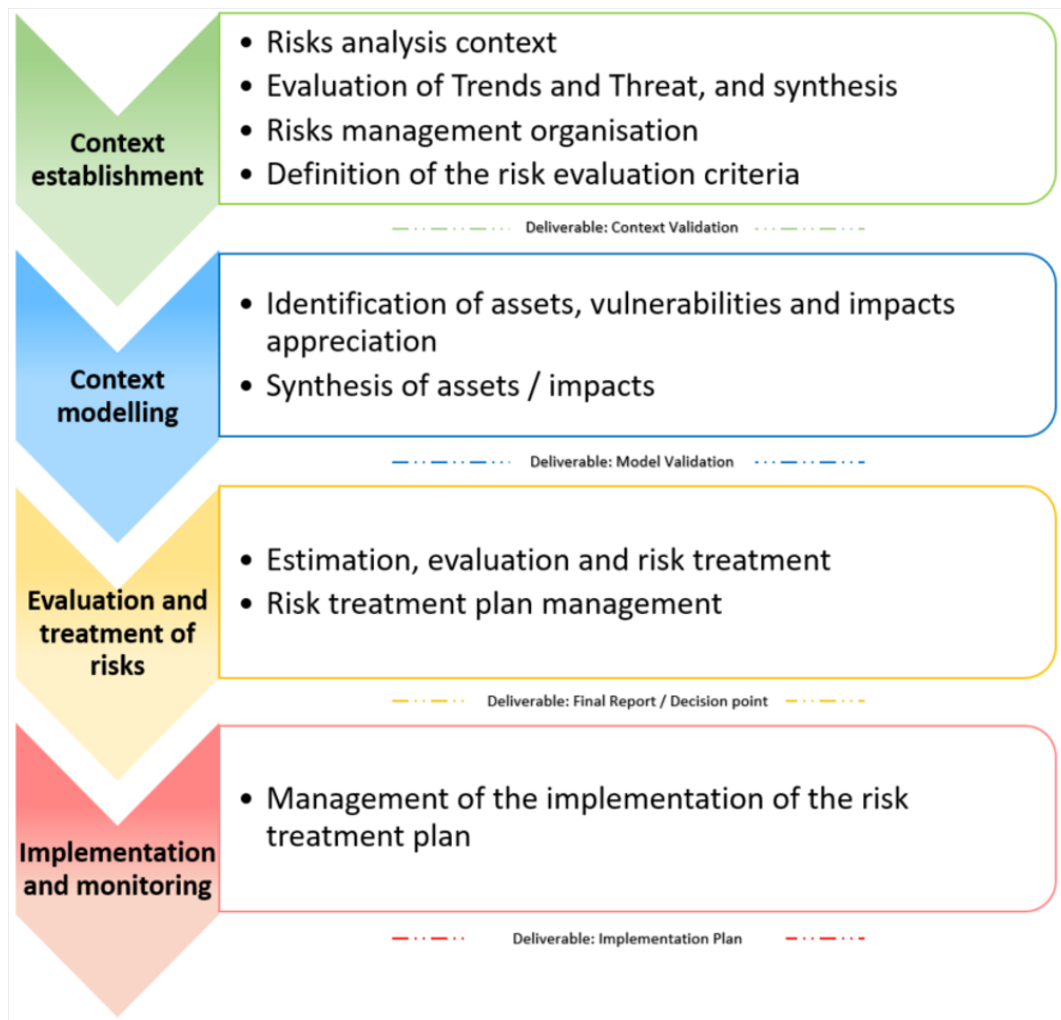
This approach is based on ISO/IEC 27005 as it is easier to understand, especially for non-tangible criteria in terms of impact and consequences, such as reputation, operational, legal, etc.

2.3. Method broadly based on ISO/IEC 27005

The illustration above displays the similarities between ISO/IEC 27005 and MONARC.



The sub-stages provided by the method are also in line with ISO/IEC 27005:



2.4. Access to methodology screens

Access to the views of the various stages of the method is provided by clicking on the numbers 1 to 4, which are displayed under the Breadcrumbs in the main MONARC view. The ISO/IEC 27005 processes are implemented via the views.

My Analysis
Risks analysis

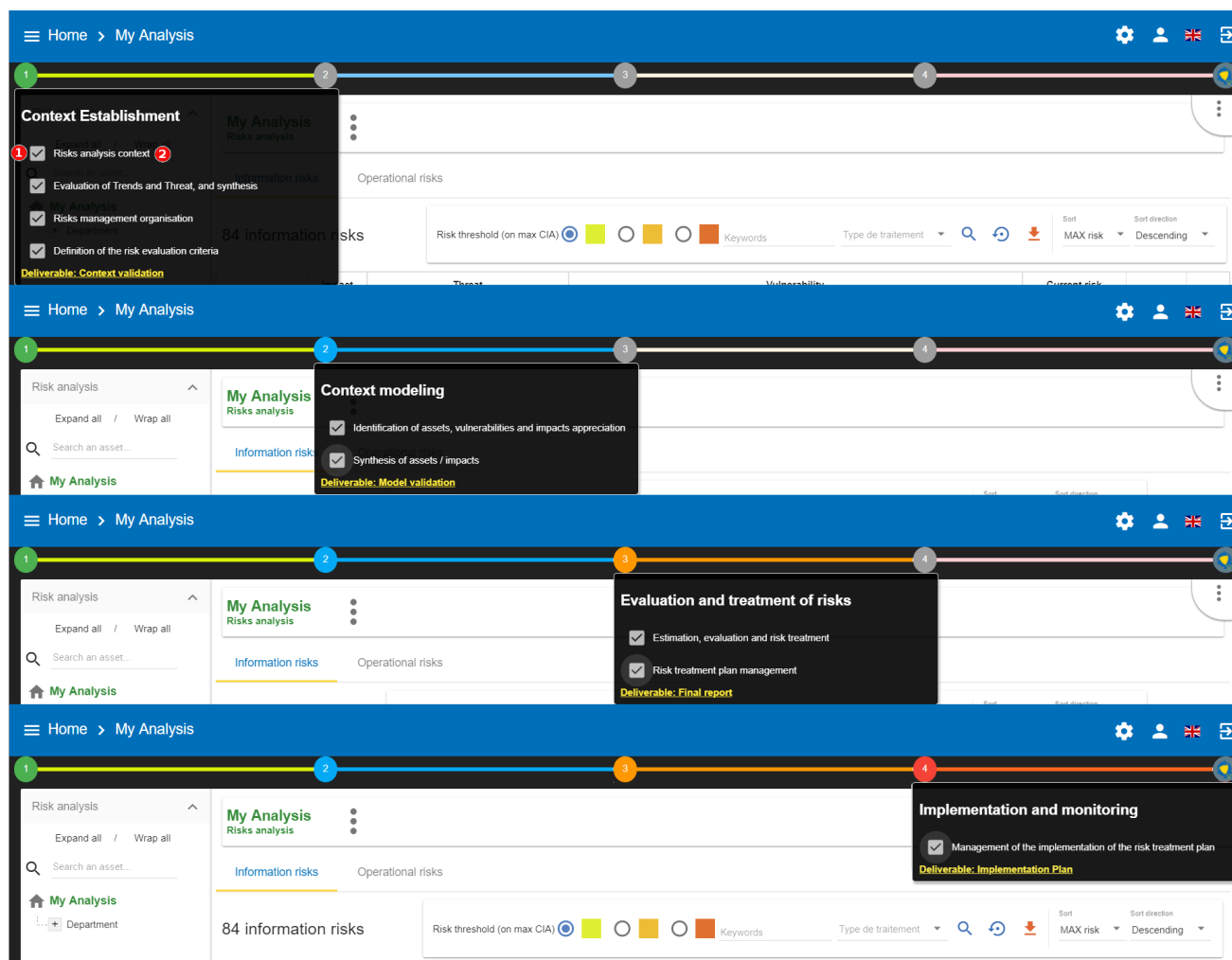
Information risks Operational risks

84 information risks

Risk threshold (on max CIA) ● ● ● ● Keywords ● Kind of treatment ● ● ● ● Sort MAX risk ● ● ● ● Sort direction Descending

Asset	Impact			Threat		Vulnerability		Current risk			Treatment	Residual risk	
	C	I	A	Label	Prob.	Label	Existing controls	Qualif.	C	I			A
Administrator workstations	-	-	-	Forging of rights	-	Authorisation management is flawed		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Forging of rights	-	User authentication is not ensured		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Forging of rights	-	The user workstation is not monitored		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Retrieval of recycled or discarded media	-	Presence of residual data unknown to the user of reallocated or discarded equipment		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Malware infection	-	Programs can be downloaded and installed without monitoring		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Malware infection	-	Update management (patches) is flawed		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Malware infection	-	No detection system of malicious programs		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Abuse of rights	-	No procedures for system install and configuration		-	-	-	-	Not treated	-
Backup management	-	-	-	Equipment malfunction or failure	-	Backups are not carried out in accordance with the state of the art		-	-	-	-	Not treated	-

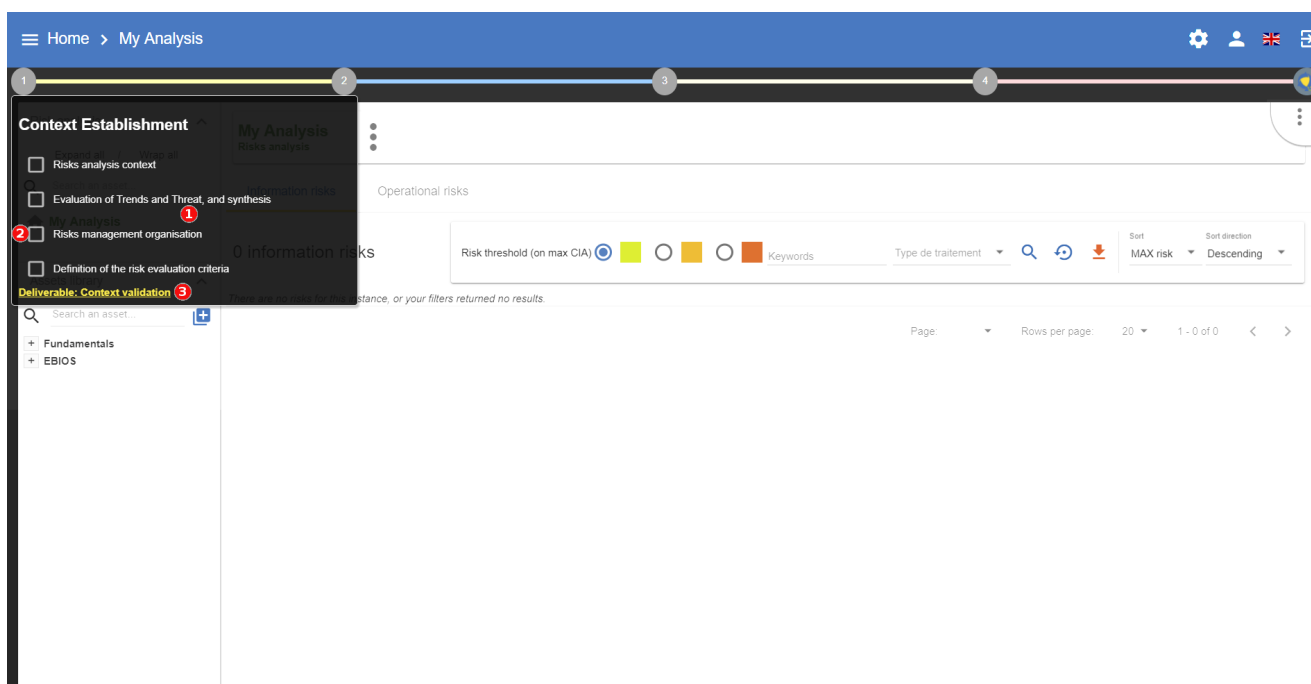
2.5. Details of the stages



1. Ticking the boxes enables the user to develop the progress status of the method
2. Clicking on the heading provides access to the management contextual sub-screen

Chapter 3. Context Establishment

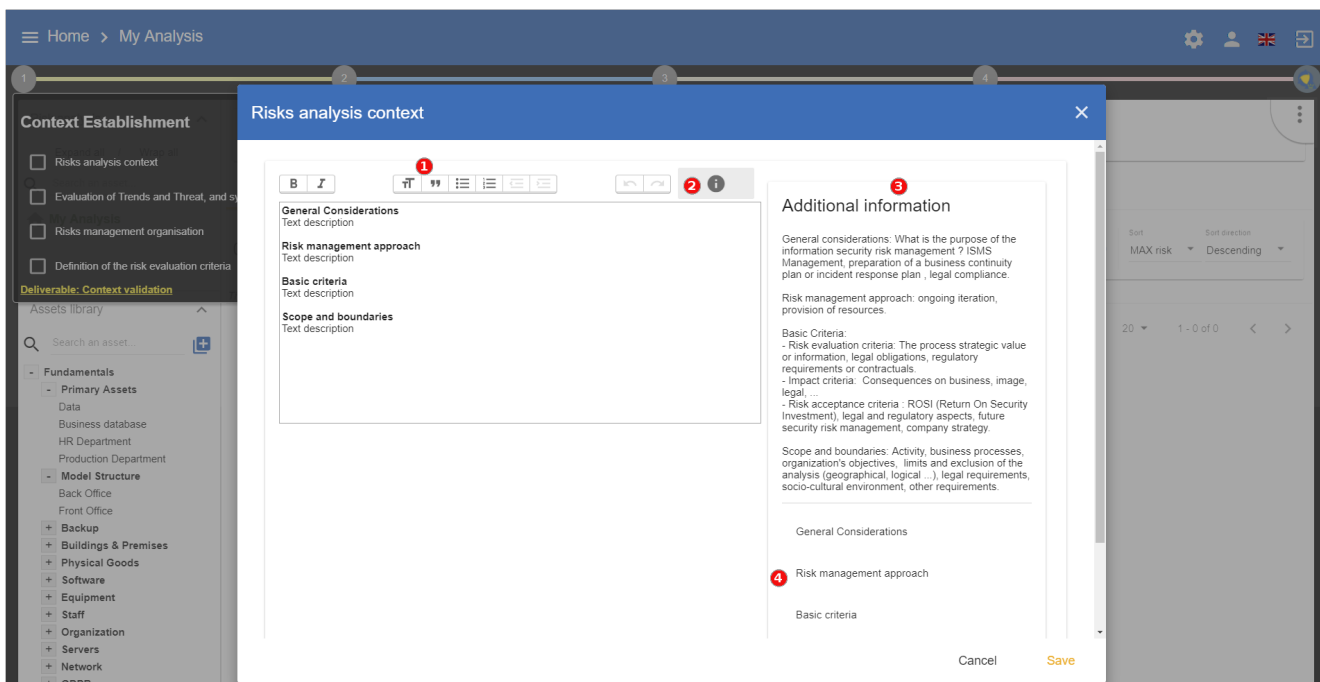
By clicking on number 1, the following menu will appear:



1. Link to the contextual management pop-ups, see the following chapters.
2. Boxes to tick, indicating that the stage selected has closed. This optional information helps to show the progress of the risk analysis project and display the risk representation graph of the dashboard.
3. Link enabling the **Validation of the context** deliverable to be generated. As part of a consultancy assignment, for instance, it may be helpful to get the client to validate it.

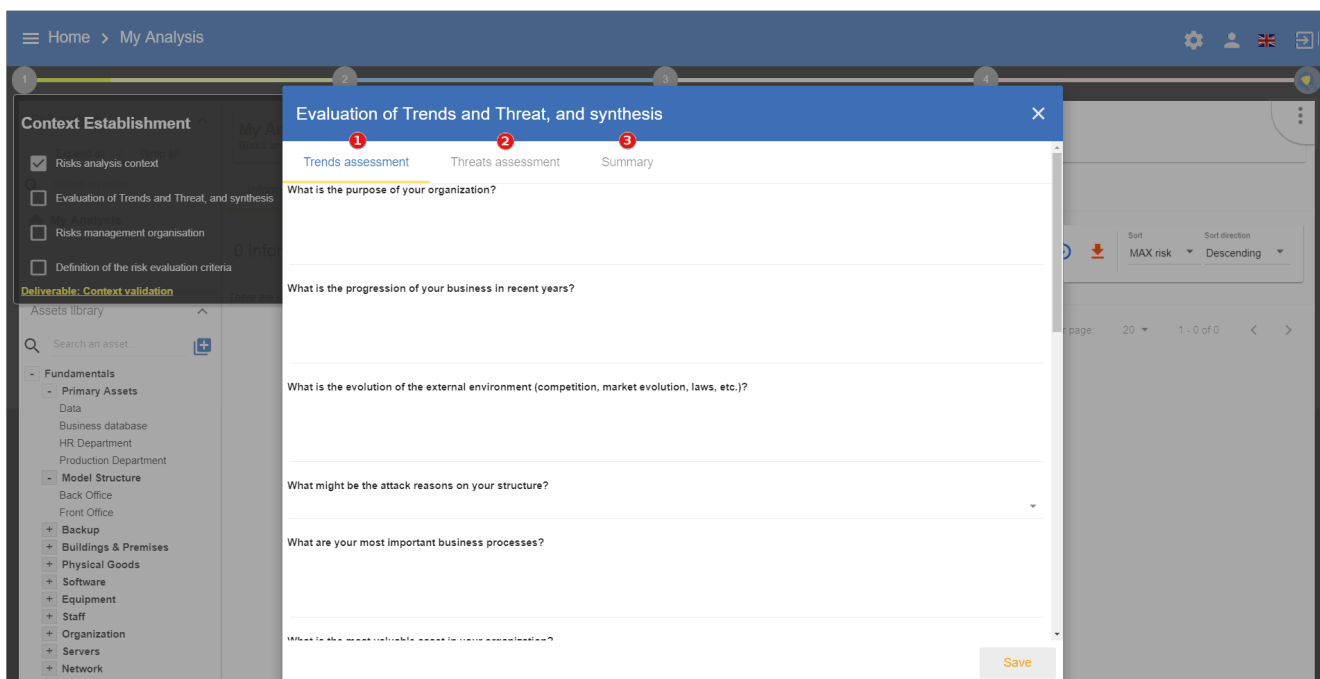
3.1. Risk analysis context

This view offers text encoding and formatting functions, enabling the risk analysis target to be contextualised with well-formatted texts that will be documented in the deliverables.



1. Access to the text formatting functions (bold, italics, paragraph, text size, etc.). The quality of the encoding directly affects that of the deliverable.
2. To display or delete the help area.
3. Help area on the content which is recommended for data entry (**Additional information**).
4. Chapters recommended by ISO27005. Clicking on the label will place it automatically in the data entry area.

3.2. Evaluation of the trends, threats and synthesis



This stage is divided into three separate parts which structures the data collection necessary for understanding the context to analyse. It is advisable to chair a working party of 5 to 10 people (depending on the organisation), bringing together the members of management, IT, risk

management department (if it exists), the heads of departments or key personnel.

1. **Trends Assessment:** MONARC provides a series of questions to establish the context from a very general perspective (see [Trends Assessment](#)).
2. **Threats Assessment:** Enables the threats to be reviewed from a general viewpoint and, possibly, to evaluate by default in the future model (for more information, see [Threats Assessment](#)).
3. **Summary** of key points determined during stages 1 and 2 (for more information, see [Summary](#)).

3.2.1. Trends Assessment

The assessment of trends provides a series of questions to establish the context from a very general perspective. These questions highlight the selection of key assets which must be taken into account during the analysis, the security criteria, as well as a few indicators concerning the motives of the attack and the external context of the target. This list is not exhaustive; you can add questions of your choice at the end of the page.

3.2.2. Threats Assessment

The assessment of threats, in similar fashion to the assessment of trends, takes the form of a meeting involving key personnel in the organisation. The purpose is to review the majority of threats by gathering information on the past and reviewing the general observations made by the group. The principle is to obtain a consensus on the probability of the threat on a scale which is easy to interpret:

- Relatively -: Never occurred, really not likely
- Normal n: No clear position, no opinion
- Relatively +: Already occurred
- Relatively ++: Already occurred on one or two occasions The security expert is responsible for converting the consensus into a probability value of 1 to n which shall be used in the model.

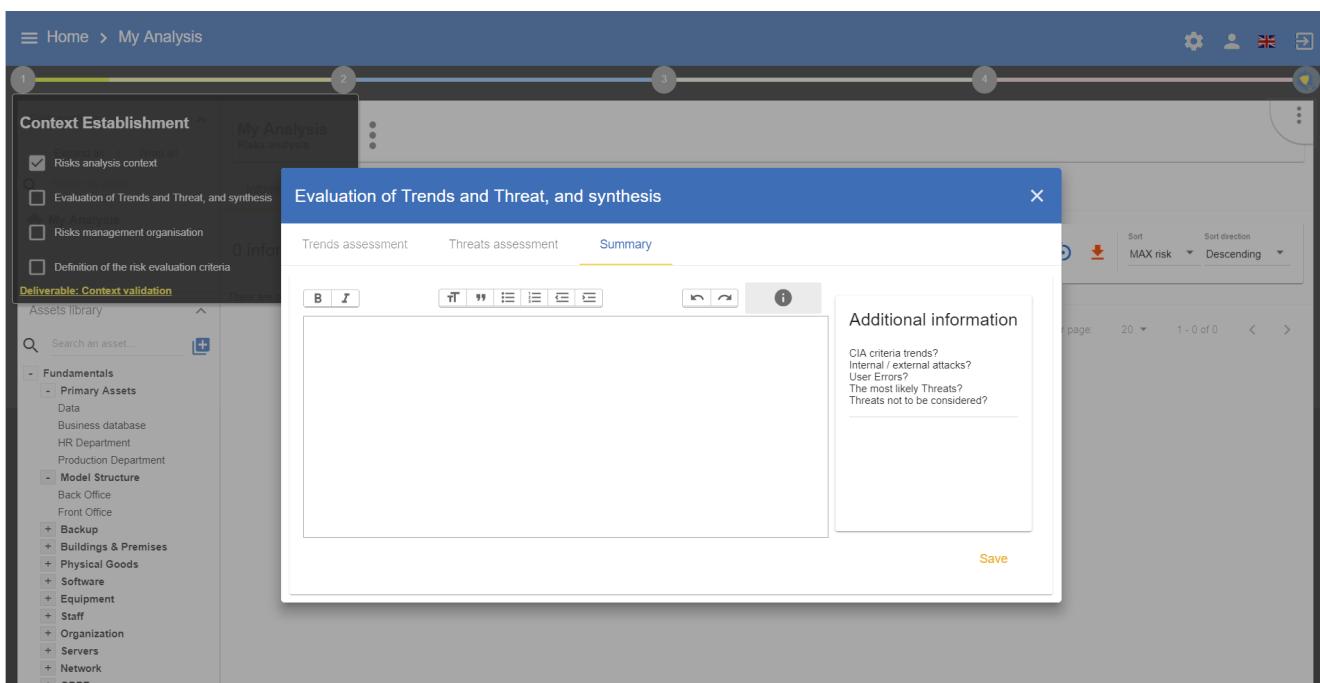
1. Click on the **Threats assessment** tab.
2. Heading of the threat.
3. Information on the threat.
4. Observation to encode, information gathering from a group of persons.
5. Information on the security criteria affected by the threat.
6. Choice of the trend, obtained by group consensus.
7. Selection of the probability deduced from point 6 by the security expert.
8. Possibility of subsequently running the threats of the model (after they have been developed).
9. **Save** the information and browse the threats.



For point 7 and 8, you have to set the scales of your risk analysis to unhide this function (see [Definition of the risk evaluation criteria](#))

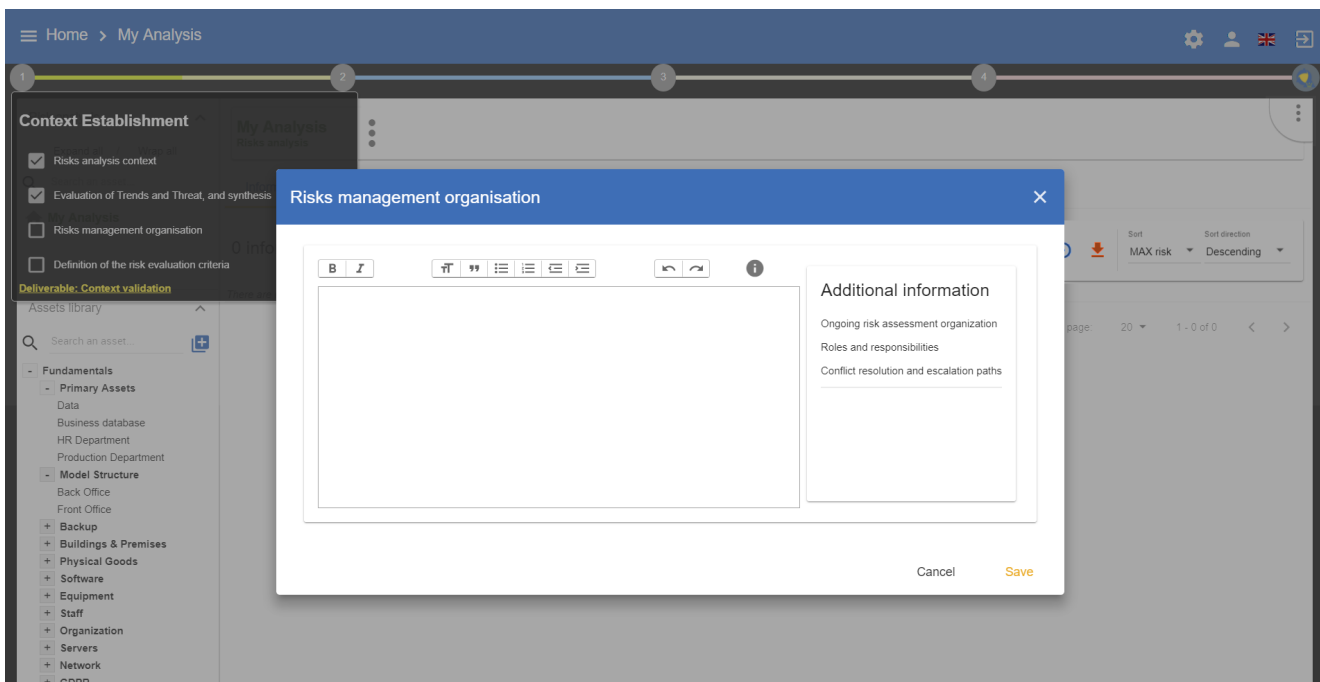
3.2.3. Summary

In similar fashion to the context of the risk analysis, this view enables the user to summarise the pertinent information gathered during the assessment of trends and threats. This text enables the user to enrich the deliverable.



3.3. Risks management organisation

This view enables the user to encode the information on the context of the risk management, for instance, with regard to the roles and responsibilities, the stakeholders, etc.



For more information, please see chapter 7.4, of ISO/IEC 27005:2011

3.4. Definition of the risk evaluation criteria

This involves personalising the scales and impact criteria and consequences. MONARC provides values by default which can be personalised depending on the context. All the scales can be modified and the levels personalised. However, it is no longer possible to modify the scales when an assessment has been encoded.

3.4.1. Impact scale

Home > My Analysis > Evaluation scales						
Impacts scale: [0 - 4] 1						
Show hidden impacts 2						
	Confidentiality 3	Integrity 4	Availability 5	Reputation 6	Operational 7	Personal 8 4 New column name
0	Nonexistent impact. The confidentiality criterion is not important.	Nonexistent impact. The integrity criterion is not important.	Nonexistent impact. The availability criterion is not important.	No consequences	No consequences	No consequences
1	Weak impact, insignificant. Information leaks are negative to the organization's interests. Examples: - Internal information leaks which shouldn't be outside the company. - Memorandum - Internal phone directory	Weak impact, insignificant. Corruption easy to rectify without any consequences. Example: - Internal mail or letter.	Weak impact, insignificant. Unavailability which is inconvenient, but not really harmful for the stakeholders. 5	Sporadic media critics	Minor incidents without any impact on customers.	Some inconvenience which will be topped without difficulty (Time waste, procedure reiteration, irritation, etc.).
2	Average impact, acceptable. Information leaks harm organization's interests. Examples: - Moderately sensitive information leaks which are only for a group of people. - Internal networking scheme. - Documentation or source code which is non-critical.	Average impact, acceptable. Corruption which brings an inconvenience to the stakeholders. Recovery is easy. Example: - Informational web site.	Average impact, acceptable. Unavailability which brings an inconvenience to the stakeholders. Example: - Maximum time periods consider as unbearable are not reached.	Temporary degradation of the company or staff reputation. Occasional media critics	Isolated incidents with a manageable impact on customers.	Significant inconvenience which could be topped with some difficulties (Additional costs, denial of access to commercial delivery, fear, misunderstanding, stress, slight physical ailments, etc.).
3	Strong impact, hardly bearable. Information leaks seriously harm organization's interest. Example: - Confidential information leaks. - Bank secrecy - Sensitive personal data - Security incident	Strong impact, hardly bearable. Corruption which brings a considerable inconvenience to the stakeholders. Example: - Confusion between stakeholders.	Strong impact, hardly bearable. Unavailability which brings a considerable inconvenience to the stakeholders. Example: - Maximum time periods consider as unbearable are reached.	Strong degradation of the company or staff reputation. Serious and repeated media critics.	Interruption of a whole department.	Significant consequences which could be topped, but with some serious difficulties (funds embezzlement, bank ban, deterioration of goods, job loss.).
4	Really strong impact, unbearable. Information leaks almost deadly harm organization's interest. Example: ...	Really strong impact, unbearable. Corruption which can't be recovered	Really strong impact, unbearable. Unavailability which asks some drastic efforts to recover, or even final	Death of someone. Definitive degradation of the	Complete stop of all services	Significant consequences almost irremediable, which can't be topped (financial distress, important financial

1. Click to modify the number of scales.
2. Click on **Show hidden impacts** to show or hide the criteria not used in the analysis.

3. Click on the symbol to hide an unused column.
4. Click on **New column name** to add a new impact criteria.
5. Click to edit the headings of each scale.



the management is similar to an Excel table, by clicking on a heading, it is possible to edit it; clicking on another, the first heading will save automatically and so forth.

By default, the impact and consequence scale includes the following criteria:

- Confidentiality
- Integrity
- Availability
- Reputation
- Operation
- Legal
- Financial
- Person (impact on the person)

It is also possible to add personalised consequences as well as impact criteria.

The same scales are used to process information risk and operational risk; there is simply a difference of interpretation :

- The information risks are evaluated on the CIA^[1] criteria by taking into account the ROLFP^[2] consequences.
- Operational risks are directly evaluated on the ROLFP^[3] criteria

3.4.2. Likelihood scale

The scale of threats is used to calculate information risks and the probability of scenarios relating to operational risks

	leaks which are only for a group of people - Internal networking scheme. - Documentation or source code which is non-critical.	Recovery is easy Example: - Informational web site	Example: - Maximum time periods consider as unbearable are not reached.	Occasional media critics	impact on customers.	commercial delivery, fear, misunderstanding, stress, slight physical ailments, etc.)
3	Strong impact, hardly bearable. Information leaks seriously harm organization's interest. Example: - Confidential information leaks. - Bank secrecy - Sensitive personal data - Security incident	Strong impact, hardly bearable. Corruption which brings a considerable inconvenience to the stakeholders. Example: - Confusion between stakeholders.	Strong impact, hardly bearable. Unavailability which brings a considerable inconvenience to the stakeholders. Example: - Maximum time periods consider as unbearable are reached.	Strong degradation of the company or staff reputation. Serious and repeated media critics.	Interruption of a whole department.	Significative consequences which could be topped, but with some serious difficulties (funds embezzlement, bank ban, deterioration of goods, job loss.)
4	Really strong impact, unbearable. Information leaks almost deadly harm organization's interest. Example: - Secret or really sensitive information leaks. - Classified information by the law (the EU, NATO, national...)	Really strong impact, unbearable. Corruption which can't be recovered or bring a permanent downtime.	Really strong impact, unbearable. Unavailability which asks some drastic efforts to recover, or even final. Example: - Important maximums time periods consider as unbearable.	Death of someone. Definitive degradation of the company or staff reputation. International media coverage.	Complete stop of all services	Significative consequences almost irremediable, which can't be topped (financial distress, important financial debts, working impossibility, long periods psychological and physiological affection, death, etc.)

Likelihood scale: [0 - 4] 1

0. Impossible 2
1. Very unlikely: never happened, requires a high level of expert knowledge, or it is very expensive to execute.
2. Unlikely: might have happened, rare phenomenon which requires a good level of expert knowledge, or it is expensive to execute.
3. Could happen occasionally
4. Very likely: easy to execute, no mentionable investment or knowledge necessary

Vulnerabilities scale: [0 - 5]

0. No vulnerabilities.
1. Very weak vulnerability: Some efficient measures have been already taken, and their effectiveness is controlled.
Very high maturity: Good practices are implemented and frequently verified.
2. Weak vulnerability: Some efficient measures have been already taken.
High maturity: Good practices are implemented.
3. Average vulnerability: Some measures have been already taken, even though they could be better.
Average maturity: Good practices are implemented without searching a better way.
4. Strong vulnerability: Some measures have been already taken, even though they are ineffective or unadapted.
Low maturity: Good practices aren't implemented, but there are some positive reactions without any thoughts.
5. Very strong vulnerability: No measures have been implemented.
Very low maturity or no maturity at all.

Acceptance thresholds of information risks

TxV

8

0 1 2 3 4 5 6 8 9 10 12 15 16 20

1. Click to modify the number of scales
2. Click to edit the heading on each scale (Management identical to the impact scale).

3.4.3. Vulnerabilities scale

The scale of vulnerabilities is only used for calculating information risks.

Likelihood scale: [0 - 4]

0. Impossible
1. Very unlikely: never happened, requires a high level of expert knowledge, or it is very expensive to execute.
2. Unlikely: might have happened, rare phenomenon which requires a good level of expert knowledge, or it is expensive to execute.
3. Could happen occasionally
4. Very likely: easy to execute, no mentionable investment or knowledge necessary

Vulnerabilities scale: [0 - 5] 1

0. No vulnerabilities 2
1. Very weak vulnerability: Some efficient measures have been already taken, and their effectiveness is controlled.
Very high maturity: Good practices are implemented and frequently verified.
2. Weak vulnerability: Some efficient measures have been already taken.
High maturity: Good practices are implemented.
3. Average vulnerability: Some measures have been already taken, even though they could be better.
Average maturity: Good practices are implemented without searching a better way.
4. Strong vulnerability: Some measures have been already taken, even though they are ineffective or unadapted.
Low maturity: Good practices aren't implemented, but there are some positive reactions without any thoughts.
5. Very strong vulnerability: No measures have been implemented.
Very low maturity or no maturity at all.

Acceptance thresholds of information risks

TxV

8

27

	0	1	2	3	4	5	6	8	9	10	12	15	16	20
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	8	9	10	12	15	16	20
2	0	2	4	6	8	10	12	16	18	20	24	30	32	40
3	0	3	6	9	12	15	18	24	27	30	36	45	48	60
4	0	4	8	12	16	20	24	32	36	40	48	60	64	80

$R = I \times (T \times V)$

R: Risk, I: Impact, T: Threat, V: Vulnerability

Acceptance thresholds of operational risks

Probability

3

	0	1	2	3	4
0	0	0	0	0	0
1	0	1	2	3	4
2	0	2	4	6	8

$R = I \times P$

R: Risk, I: Impact, P: Probability

1. Click to modify the number of scales
2. Click to edit the heading on each scale (Management identical to the impact scale).

3.4.4. Acceptance thresholds

There are two separate tables for acceptability thresholds, as operational risk and information risk

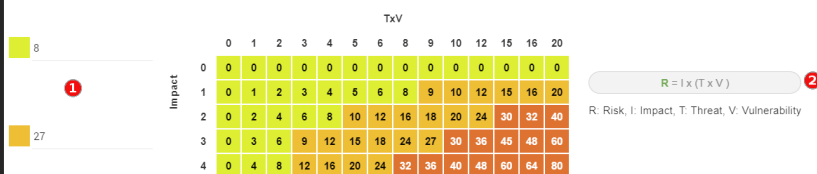
are not calculated in the same way. Information risks are calculated using three criteria:

1. Very unlikely: never happened, requires a high level of expert knowledge, or it is very expensive to execute.
2. Unlikely: might have happened, rare phenomenon which requires a good level of expert knowledge, or it is expensive to execute.
3. Could happen occasionally
4. Very likely: easy to execute, no mentionable investment or knowledge necessary

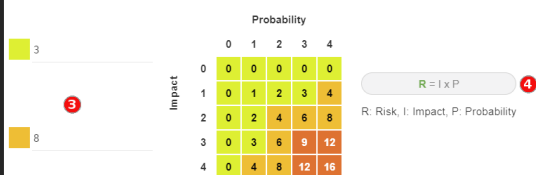
Vulnerabilities scale: [0 - 5]

0. No vulnerabilities.
1. Very weak vulnerability: Some efficient measures have been already taken, and their effectiveness is controlled.
2. Weak vulnerability: Some efficient measures have been already taken.
3. Average vulnerability: Some measures have been already taken, even though they could be better.
4. Strong vulnerability: Some measures have been already taken, even though they are ineffective or unadapted.
5. Very strong vulnerability: No measures have been implemented.

Acceptance thresholds of information risks



Acceptance thresholds of operational risks



1. Modification of thresholds levels of informations risks. The table displayed above (as well as the risk analysis tables) is updated automatically.
2. Information risks are calculated using three criteria: **Impact x Threat x Vulnerability**
3. Modification of thresholds levels of operational risks. The table displayed above (as well as the risk analysis tables) is updated automatically.
4. Operational risks are calculated using two criteria: **Impact x Probability**

3.5. Deliverable: Context validation

This deliverable includes all the information gathered and entered in the context establishment phase. It can be used to validate the information provided by the client, before beginning the risk identification. A form has to be filled in. When the user clicks on **Save**, a file in Word format is generated.

Home > My Analysis > Evaluation scales

1

2

3

4

Context Establishment

☒ Risks analysis context

☒ Evaluation of Trends and Threat, and synthesis

☒ Risks management organisation

☒ Definition of the risk evaluation criteria

Deliverable: Context validation

1

2

3

4

Weak impact, insignificant. Information leaks are negative to the organization's interests. Examples:

- Internal information leaks which shouldn't be outside the company
- Memorandum
- Internal phone directory

Weak im

Average impact, acceptable. Information leaks harm organization's interests. Examples:

- Moderately sensitive information leaks which are only for a group of people
- Internal networking scheme
- Documentation or source code which is non-critical

Average

Strong impact, hardly bearable. Information leaks seriously harm organization's interest. Example:

- Confidential information leaks
- Bank secrecy
- Sensitive personal data
- Security incident

Strong in

Really strong impact, unbearable. Information leaks almost deadly harm organization's interest. Example:

Really strong impact, unbearable. Corruption which can't be rectified

Deliverable

Status

Draft

Template *

Version

Classification

Document name

Client manager(s)

Security consultant(s)

Cancel

Save

Personal

New column name

ence which will be topped without waste, procedure reiteration, imitation,

venience which could be topped with (Additional costs, denial of access to very fear, misunderstanding, stress, ailments, etc.)

sequences which could be topped, but us difficulties (funds embezzlement, roration of goods, job loss.)

Significative consequences almost irremediable, which can't be topped (financial distress, important financial

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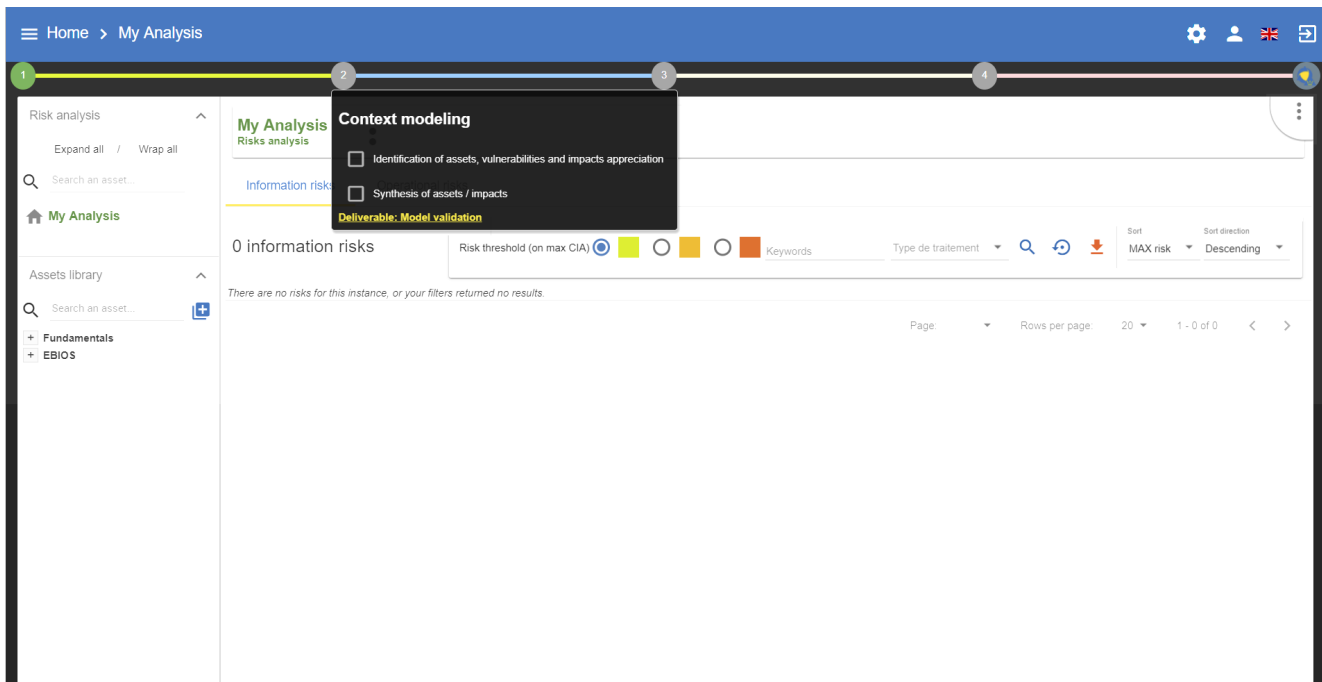
[1] CIA, Confidentiality, Integrity and Availability.

[2] rolfp, Reputation, Operational, Legal, Financial and Personal

[3] rolfp

Chapter 4. Context Modeling

By clicking on number **2**, the following menu will appear:



4.1. Identification of assets, vulnerabilities and impacts appreciation

4.1.1. Identification of assets

Clicking on the link **Identification of assets, vulnerabilities and impacts appreciation** will generate the main view of MONARC. The purpose is to create the risk model by using the assets in the library. The principle of the modelling is to place at the root the analysis of the primary assets, then place the support assets which make up the parts above it. The context establishment phase is used for determining the primary assets which will be the subject of the analysis. At this stage of the analysis, certain secondary assets may already be known. By default, MONARC offers a **Front Office** and **Back Office** structure; however, this is not an obligation. It is vital that the construction of the model follows a contextual logic, the assets and terms listed must use the organisation's terminology. To do this, the user must not hesitate to rename the assets provided by default by the library.

Principe of the *front office/back office* structure

The screenshot displays the 'My Analysis' interface in MONARC. The top navigation bar shows 'Home > My Analysis'. The sidebar on the left contains 'My Analysis' (with a red '1' next to 'Front Office') and 'Assets library'. The main content area shows '95 information risks' with a table of risk analysis results.

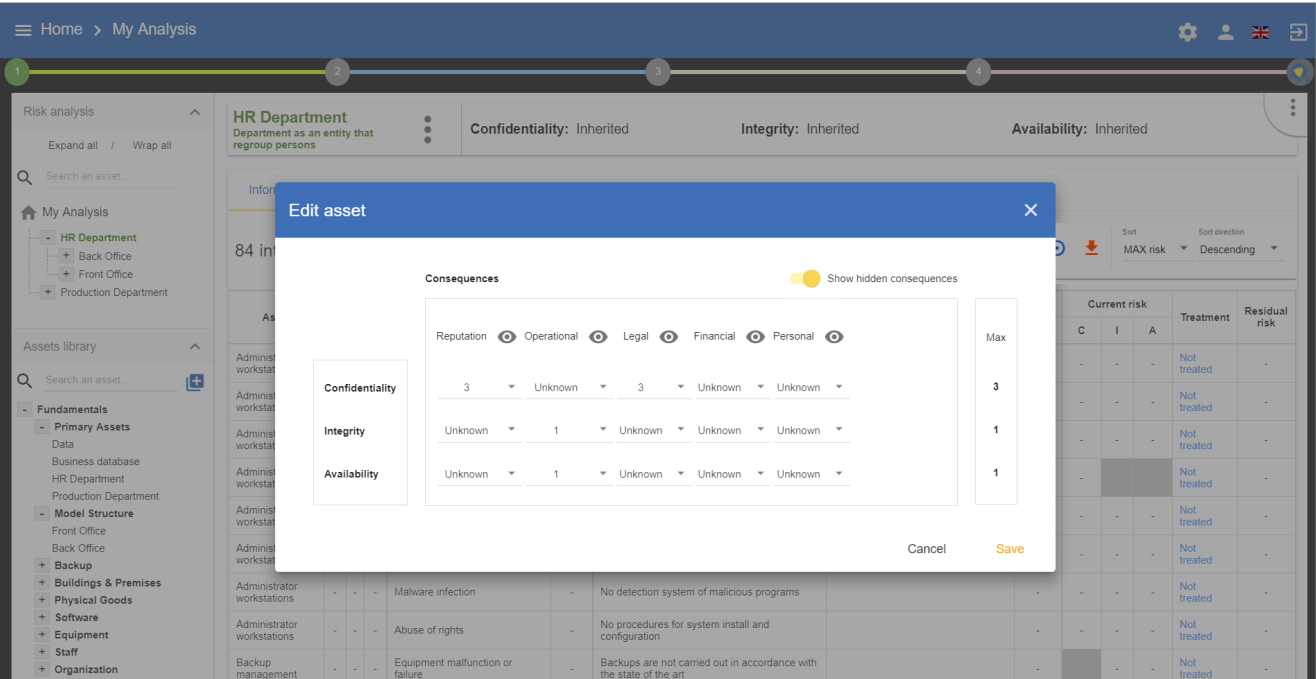
Asset	Impact			Threat	Prob.	Vulnerability		Qualif.	Current risk			Treatment	Residual risk
	C	I	A			Label	Existing controls		C	I	A		
Administrator workstations	-	-	-	Forging of rights	-	Authorisation management is flawed		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Forging of rights	-	User authentication is not ensured		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Forging of rights	-	The user workstation is not monitored		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Retrieval of recycled or discarded media	-	Presence of residual data unknown to the user of reallocated or discarded equipment		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Malware infection	-	Programs can be downloaded and installed without monitoring		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Malware infection	-	Update management (patches) is flawed		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Malware infection	-	No detection system of malicious programs		-	-	-	-	Not treated	-
Administrator workstations	-	-	-	Abuse of rights	-	No procedures for system install and configuration		-	-	-	-	Not treated	-
Backup management	-	-	-	Equipment malfunction or failure	-	Backups are not carried out in accordance with the state of the art		-	-	-	-	Not treated	-

1. The **Front Office** represents the “user” side; for example, in the case of a “Human Resources” department we will find employees and the complete IT system to which they have access (office, workstation, hardware, software, individuals, etc.).

The **Back Office** represents the IT and organisational side of the organisation that are common to all concerned (building, data centre, network, administrators, common rules, etc.).

4.1.2. Impacts appreciation

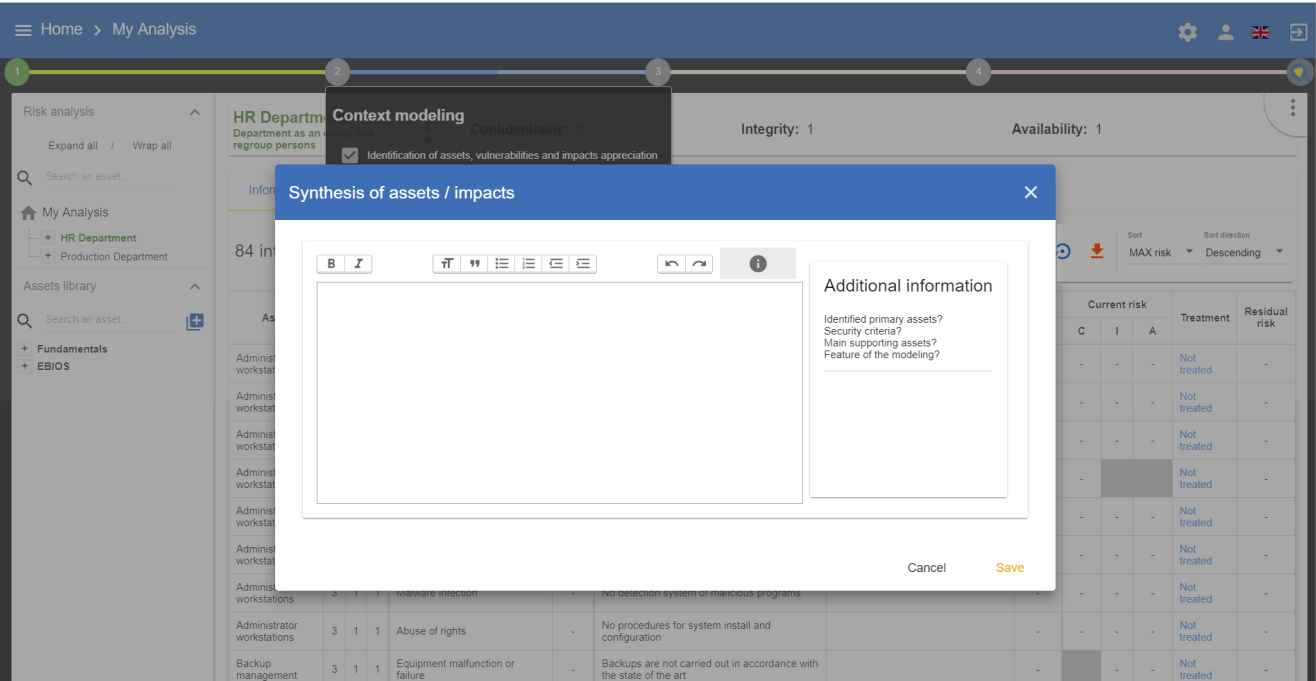
For each primary asset, the impact and consequences which may apply must be defined, if the risks in the model arise. By default, all the supporting assets will inherit these impacts, but it is also possible to redefine them. When the primary asset is a service, then the **C (Confidentiality)** and the **I (Integrity)** refers to the most sensitive information of the service in question. **A (Availability)** refers to the service and the information, based on the principle that if the information is available, the service will also be available. When the primary asset is the information, there is no ambiguity regarding the CIA criteria - it refers to all the information. In certain rarer cases, if the **C** associated with a service conveys the confidentiality of the operating procedure (e.g. manufacturing process), the user just has to express the assets in the model separately in the form of an informational asset and a service.



The value of the CIA criteria is deduced automatically according to the ROLFP consequences or other consequences which have been associated with them (maximum value). For example: In the case of the abovementioned example, the 3 impact level on confidentiality is explained by the maximum ROLFP value regarding the confidentiality, which in this case is 3 in terms of consequence for the person.

4.2. Summary of assets/impact

The summary of the assets will provide editorial content that justifies the choice of assets and impact for the deliverable.



4.3. Deliverable: Validation of the model

This deliverable covers all the significant primary assets of the model.



Those on which the impact is reported as well as the asset summary.

A form has to be filled in. When the user clicks on **Save**, a file in Word format is generated.

The screenshot shows the MONARC web application interface. A 'Deliverable' form is open in the foreground, overlaying the 'Context modeling' section of the 'My Analysis' page. The form contains the following fields:

- Status: Draft
- Template *
- Version
- Classification
- Document name
- Client manager(s)
- Security consultant(s)

At the bottom of the form are 'Cancel' and 'Save' buttons. The background interface shows a sidebar with 'Risk analysis', 'My Analysis', and 'Assets library'. The main content area displays 'Context modeling' with a table of assets and a risk matrix.

Current risk			Treatment	Residual risk
C	I	A		
-	-	-	Not treated	-
-	-	-	Not treated	-
-	-	-	Not treated	-
-	-	-	Not treated	-
-	-	-	Not treated	-
-	-	-	Not treated	-
-	-	-	Not treated	-
-	-	-	Not treated	-

Chapter 5. Evaluation and treatment of risks

By clicking on number **3**, the following menu will appear:

Evaluation and treatment of risks
Integrity: 1

- ☒ Estimation, evaluation and risk treatment
- ☐ Risk treatment plan management
- Deliverable: Final report**

84 information risks

Asset	Impact			Threat		Vulnerability			Current risk			Treatment	Residual risk
	C	I	A	Label	Prob.	Label	Existing controls	Qualif.	C	I	A		
Administrator workstations	3	1	1	Forging of rights	-	Authorisation management is flawed		-	-	-	-	Not treated	-
Administrator workstations	3	1	1	Forging of rights	-	User authentication is not ensured		-	-	-	-	Not treated	-
Administrator workstations	3	1	1	Forging of rights	-	The user workstation is not monitored		-	-	-	-	Not treated	-
Administrator workstations	3	1	1	Retrieval of recycled or discarded media	-	Presence of residual data unknown to the user of reallocated or discarded equipment		-	-	-	-	Not treated	-
Administrator workstations	3	1	1	Malware infection	-	Programs can be downloaded and installed without monitoring		-	-	-	-	Not treated	-
Administrator workstations	3	1	1	Malware infection	-	Update management (patches) is flawed		-	-	-	-	Not treated	-
Administrator workstations	3	1	1	Malware infection	-	No detection system of malicious programs		-	-	-	-	Not treated	-
Administrator workstations	3	1	1	Abuse of rights	-	No procedures for system install and configuration		-	-	-	-	Not treated	-
Backup management	3	1	1	Equipment malfunction or failure	-	Backups are not carried out in accordance with the state of the art		-	-	-	-	Not treated	-

Clicking on the link **Estimation, evaluation and risk treatment** will generate the main view of MONARC.

5.1. Evaluation and treatment of risks

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Asset	Impact			Threat		Vulnerability			Current risk			Treatment	Residual risk
	C	I	A	Label	Prob.	Label	Existing controls	Qualif.	C	I	A		
Administrator workstations	3	1	1	Forging of rights	3 1	User authentication is not ensured	No password policy 2	5 3	45	15	15	Not treated 4	18
Administrator workstations	3	1	1	Forging of rights	3	The user workstation is not monitored	The workstations are not monitored	5	45	15	15	Reduction	18
Administrator workstations	3	1	1	Malware infection	2	Programs can be downloaded and installed without monitoring	No measure	5	30	10	10	Reduction	0

The previous phase provided the impact criteria information; now it is necessary to evaluate threats and vulnerabilities in order to calculate risk levels.

5.1.1. Assessment of the probability of threats

If the threat assessment made while establishing context provided probabilities (see [Threats Assessment](#)), it is necessary to return to this screen to run all the threats of the model.

1. **Prob.:** Then, when reviewing the model's risks, the default values may all be revised individually.

5.1.2. Assessment of vulnerabilities

2. The level of vulnerabilities depends directly on the **existing controls**. It is necessary to describe all these measures in a factual manner.
3. The **qualification** of the vulnerability can be set according to the **existing controls**.

5.1.3. Risk processing

4. Processing risks in MONARC, by clicking on **Not treated**, involves, in similar fashion to ISO/IEC 27005, making a decision so as to process. There are four ways to process the risk:
 - **Accept:** The risk is accepted in its current form. No additional action will be initiated.
 - **Modify/reduce:** Measures are put in place to reduce the risk to an acceptable level. The reduction level is then evaluated in order to calculate the residual risk.
 - **Share:** in the case of insurance, for example. This type of processing is specific, as it tends to reduce the risk impact and not the vulnerability. The residual risk cannot be calculated.
 - **Deny:** The cause of the risk is eliminated; after processing, the risk must not longer be present.



It is also possible to add a recommendation to implement see [Risk information sheet in user guide](#).

5.2. Risk treatment plan management

All risks covered by one of the four procedures described above are registered in the risk management plan, irrespective of whether they are information risks or operational risks. The calculation formula is not the same for both types of risk; therefore, it is the importance of the recommendations which establish the order of risk. Nevertheless, it is possible to reset the order of the risk processing plan before generating the final deliverable.

Risk treatment plan management

Reset positions

	Recommendation	Imp.	Asset	Existing controls	Current risk	Residual risk
+	Authorisation Implement a procedure for the authorisation management	***	Administrator workstations	No procedure	36	9
+	Monitoring Implement a monitoring of the workstation	***	Administrator workstations	The workstations are not monitored	45	18
+	Program management Implement a white list of the program which have been approved by the IT department	***	Administrator workstations	No measure	30	0
+	Administrator right Remove the administrator right from the workstations of the users	**	Administrator workstations	There is no procedures	15	9
+	Patch management Check if the patch are really applied	**	Administrator workstations	The patch are normally done in automatic	12	6

5.3. Deliverable: End report

The deliverable contains a complete list of all the information gathered and entered in MONARC, including that contained in the two previous deliverables. A form has to be filled in. Moreover, it is possible to add a **summary of risk evaluation**. When the user clicks on **Save**, a file in Word format is generated.

Deliverable

Status: Draft

Template *

Version

Classification

Document name

Client manager(s)

Security consultant(s)

Summary of risk evaluation:

Rich text editor: B I [Formatting icons]

Buttons: Cancel, Save

Chapter 6. Implementation and monitoring

By clicking on number 4, the following menu will appear:

Implementation and monitoring

☐ Management of the implementation of the risk treatment plan

[Deliverable: Implementation Plan](#)

84 information risks

Asset	Impact			Threat	Prob.	Vulnerability			Qualif.	Current risk			Treatment	Residual risk
	C	I	A			Label	Existing controls	C		I	A			
Administrator workstations	3	1	1	Forging of rights	3	The user workstation is not monitored	The workstations are not monitored	5	45	15	15	Reduction	18	
Administrator workstations	3	1	1	Forging of rights	3	Authorisation management is flawed	No procedure	4	36	12	12	Reduction	9	
Administrator workstations	3	1	1	Malware infection	2	Programs can be downloaded and installed without monitoring	No measure	5	30	10	10	Reduction	0	
Administrator workstations	3	1	1	Abuse of rights	1	No procedures for system install and configuration	There is no procedures	5	15	5	5	Not treated	15	
Administrator workstations	3	1	1	Malware infection	2	Update management (patches) is flawed	The patch are normally done in automatic	2	12	4	4	Not treated	12	
Administrator workstations	3	1	1	Malware infection	2	No detection system of malicious programs	Antivirus installed and up to date	2	12	4	4	Not treated	12	
Administrator workstations	3	1	1	Forging of rights	3	User authentication is not ensured	No password policy	1	9	3	3	Not treated	9	
Backup management	3	1	1	Theft or destruction of media, documents or equipment	3	Backup media are not stored in a suitable place	The backups are well managed following the good practices	1	9		3	Not treated	9	
Administrator workstations	3	1	1	Retrieval of recycled or discarded media	1	Presence of residual data unknown to the user of reallocated or discarded equipment	A procedure is implemented	2	6			Not treated	6	

This view goes beyond the ISO/IEC 27005, as it enables the user to manage the follow-up to the implementation of the measures.

Implementation of the risk treatment plan

Open the implementation history

Recommendation	Imp.	Comment	Manager	Deadline	Status	Actions
Authorisation Implement a procedure for the authorisation management	***			jj-mm-yyyy	Coming	[icon]
Monitoring Implement e a monitoring of the workstation	***			jj-mm-yyyy	Coming	[icon]
Program management Implement a white list of the program which have been approved by the IT department	***			jj-mm-yyyy	Coming	[icon]
Administrator right Remove the administrator right from the workstations of the users	**			jj-mm-yyyy	Coming	[icon]
Patch management Check if the patch are really applied	**			jj-mm-yyyy	Coming	[icon]

1. This is a **recommandation** established before.
2. You can put a **comment** for the implementation of the recommendation.
3. For each recommendation you can set a **manager**.
4. For each recommenddation you can set a **deadline**.
5. Click on the icon [\[icon\]](#) to implement the recommenation and switch on the following view.

The screenshot shows the 'Recommendation' step in the MONARC interface. The breadcrumb trail is: Home > My Analysis > Implementation of the risk treatment plan > Recommendation. The left sidebar shows 'Risk analysis' and 'My Analysis' sections. The main content area is titled 'Authorisation' with the subtitle 'Implement a procedure for the authorisation management'. Below this is a table with the following data:

Asset	Threat	Vulnerability	Existing controls	Current risk	New controls	Residual risk	Actions
Administrator workstations	MD14 - Forging of rights	1166 - Authorisation management is flawed	No procedure	36	1	9	✓ 2

1. Set the **new control**, now in place. It will replace the old one in the risk analysis and also replace the old current risk by the residual risk.
2. Definitively validate the measure by clicking on icon



Follow the same procedure for each recommendation. After that go to your risk analysis and make a second iteration.

6.1. Implementation history

All validations are stored in history and can be consulted:

The screenshot shows the 'Implementation history' table in the MONARC interface. The breadcrumb trail is: Home > My Analysis > Implementation of the risk treatment plan. The left sidebar shows 'Risk analysis' and 'My Analysis' sections. The main content area is titled 'Implementation of the risk treatment plan' with a link 'Open the implementation history'. Below this is a table with the following data:

	Recommendation	Imp.	Comment	Manager	Deadline	Status	Actions
⌚	Monitoring Implement e a monitoring of the workstation	***			jj-mm-yyyy	Coming	🔗
⌚	Program management Implement a white list of the program which have been approved by the IT department	***			jj-mm-yyyy	Coming	🔗
⌚	Administrator right Remove the administrator right from the workstations of the users	**			jj-mm-yyyy	Coming	🔗
⌚	Patch management Check if the patch are really applied	**			jj-mm-yyyy	Coming	🔗

1. Click to view past recommendations

The screenshot shows the 'Risk sheet' interface in MONARC. The breadcrumb navigation is 'Home > My Analysis > Implementation of the risk treatment plan > Risk sheet'. The left sidebar contains 'Risk analysis' with options to 'Expand all' or 'Wrap all', a search bar, and a tree view for 'My Analysis' (Data, HR Department, Production Department) and 'Assets library' (Fundamentals, EBIOS). The main content area is titled 'Implementation history' and contains a table with the following data:

By	Recommendation	Risk	Implementation comment	Risk before	Risk after
Jérôme Lombardi	*** Authorisation Implement a procedure for the authorisation management Comment: Deadline: Manager:	Asset type: OV_POSTE_FIXE - Ordinateur de bureau Asset: Postes de travail admin Threat: MD14 - Usurpation de droits Vulnerability: 1166 - La gestion des autorisations comporte des failles Treatment type: Reduction Existing controls: No procedure New controls:		36	9

6.2. Deliverable: Implementation Plan

The deliverable contains the recommendations to implement table and the implemented recommendations table. A form has to be filled in. When the user clicks on **Save**, a file in Word format is generated.

The screenshot shows the 'Deliverable' form overlaying the 'Risk sheet' table. The form has the following fields:

- Status: Draft
- Template *
- Version
- Classification
- Document name
- Client manager(s)
- Security consultant(s)

At the bottom of the form are 'Cancel' and 'Save' buttons. The background table is partially visible, showing columns for 'Current risk' (C, I, A), 'Treatment', and 'Residual risk'.

Current risk			Treatment	Residual risk
C	I	A		
45	15	15	Reduction	18
36	12	12	Reduction	9
30	10	10	Reduction	0
15	5	5	Not treated	15
12	4	4	Not treated	12
12	4	4	Not treated	12
9	3	3	Not treated	9
9	3	3	Not treated	9
6			Not treated	6