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European foreword

This document (EN 9239:2016) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2016, and conflicting national standards shall be withdrawn at the latest by November 2016.

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Introduction

Risk Management forms an integral part of programme management. It should be implemented right from the start of the project feasibility phase and continue until material disposal. The ultimate goal is to contribute to an appropriate definition of programme objectives (costs, schedules and performances …) and to continuously ensure that they are met or enhanced, despite any events likely to affect the programme through its lifecycle. By implementing methods, the programme manager can manage risks in another way than by using intuitive and non-formalised procedures. The aim of this document is to describe the implementation of Risk Management within the Programme Management framework. It complements programme management guidelines EN 9200.

This document is to be used as a basis, for any given programme, for negotiating the requirements and relationships between customers and suppliers; they should comply with to ensure Management of Risk.

1 Scope

This document enables to answer specific needs in the field of Aeronautics although it does not present any sectorial characteristic and may therefore apply to the needs of other areas.

However, the specificity of some areas can lead to the use of existing sectorial standards such as EN ISO 17666 Space systems – Risk management (ISO 17666:2003).

This document:

— proposes the main steps for setting up Risk Management framework within programme Management. This guideline may serve as a basis for writing a Risk Management specification;
— describes a process for controlling programme risks within the defined boundaries that are considered as tolerable. This standard process can be used as a methodological guide for writing the programme Risk Management Plan;
— recognises the need for knowledge management related to Risk Management, in order to capitalize and to share lessons learnt with other programmes, as well as the maturity assessment of the Risk Management;
— identifies useful documents for Risk Management;
— proposes an example of a typical checklist of risks related to a programme;

in addition:

— addresses opportunities. An opportunity is an uncertain event with positive consequences on the programme.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 9200, *Aerospace series — Programme management — Guidelines for project management specification*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
risk
uncertain event or circumstance which could have a negative impact on the objectives of the programme

3.2
cause
event which is at the origin of a potential risk

3.3
severity
assessment of the significance of a risk impact with respect to the potential consequences on a programme

3.4
impact
effects of a risk on the programme should it occur

3.5
criticality/level of risk
characteristic of the risk significance. It enables prioritization of the risks

Note 1 to entry: It is generally the combination of the severity and the probability of the risk.

3.6
detectability
ability or capacity to detect the direct trace of a risk or the triggering point of one of its causes

3.7
level of risk tolerance
criticality value beyond which specific actions to treat the risk are required

3.8
likelihood / probability/occurrence of the risk
assessment of the probability / likelihood or frequency of a risk to occur

3.9
risk portfolio
represented set of identified risks intended to be treated

3.10
lessons learnt - experience feedback
collection and exploitation, by all the stakeholders, of information concerning the events which have occurred throughout programme, relating to risk management

3.11
residual risk
risk remaining after mitigating actions (protection, prevention, …)

3.12
opportunity
uncertain event or circumstance with potentially positive effects on the objectives (improvement) of a programme

4 Framework of Risk Management in the programme

4.1 General

The framework of Risk Management in the programme should be set up right from the feasibility phase through to disposal phase.

It covers the whole life cycle of the programme, all its components and activities.

It is led by the programme manager, who is responsible for defining the conditions within which it is organised and operated.

It is based on multidisciplinary skills (law, technical, finance, logistics, …) in order to identify the various aspects of risks and take into account the different points of view.

All programme stakeholders have a role, and should take an active part in Risk Management.

The Risk Management framework is described in a document (a specific chapter of Programme Management Plan or a dedicated Risk Management Plan) approved established by the programme manager.

4.2 Customer's requirements

The customer should express in the programme management specification his requirements concerning the implementation by his supplier, if necessary, of a risk management framework as well as the rules related to risk information exchanged between customers and suppliers.

The supplier should comply with these requirements in one chapter of his Programme Management Plan.

The supplier will detail in this chapter:

— programme framework in terms of Risk Management, in particular the roles and responsibilities of each stakeholder in the programme,
— rules for cascading and or distributing these requirements to sub-contractor level,
— Risk Management process and associated deliverables (documentation, status reports, …),
— assessment, prioritization and definition criteria of risk criticality level,
— rules for sharing risk information with the customer.

4.3 Roles and Responsibilities

Programme manager: is responsible for managing the programme risks, and therefore is the risks owner. He validates the process to be implemented as well as the assessment criteria for risk prioritization and criticality. He ensures regular reviews of risk, validates the action plan for treating the major risks, selects the risks treated at his level among the most critical ones, communicates with the relevant stakeholder internal or external to the company (customers and suppliers especially), and appoints the risk manager, if necessary.

NOTE Risk decision and acceptance should be addressed at the appropriate level specific to each organisation.

Risk manager: defines and implements the Risk Management process under the authority of the Programme manager, runs it in the programme, ensures a global visualisation of all risks identified in the programme, ensures quality of data and manages communication to all those who have a stake in the programme.

Risk owner: proposes the risk assessment. He leads the actions defined for risk treatment, ensures that each person in charge of an action is informed of what has to be done and conducts his action.

Action owner: carries out the assigned action.

The above mentioned organisation is to be adapted according to size and configuration of each programme.

Others actors can be involved as "watchmen" who have to detect the weak signals coming from the environment (economic, technical, …) of the programme(s).

4.4 Multidisciplinary groups

As risks are varied by nature, one individual person cannot ensure their complete management.

Therefore, using all the employees' skills within the company is required during all the phases of the process, for instance by forming multidisciplinary groups.

Resorting to internal skills requires an overall monitoring to avoid dispersion or ineffectiveness and also the setting up of well defined rules.

Different group working methods can be involved when appropriate, which include interviews, subject matter experts (SME), and brainstorming.

5 Risk Management process

5.1 Steps of risk management

The main stages of risk management are (see Figure 1):

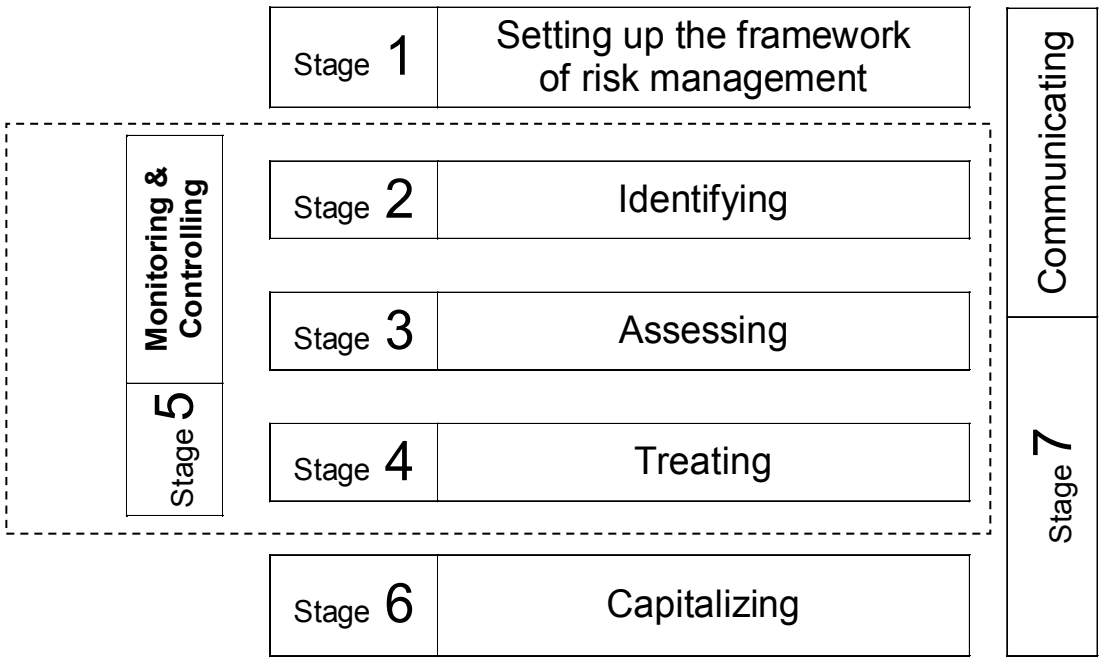

Figure 1 — Main stages of risk management

Stage 1 Setting up of Risk Management framework

Firstly, a Risk Management Plan shall be prepared, taking into account the general context of the programme. It will include:

— organisation,
— roles and responsibilities of the main stakeholders,
— risk management process,
— reporting applied to programme (indicators, risk assessment report),
— allocated resources,
— utilised tools,
— interfaces with external entities,
— links with the programme environment/context, especially human relationships, …

Stage 2 Identifying

This step aims at identifying and sorting risks in the programme, as early as possible (according to the company processes).

Risk identification is carried out from:

— analysis of field experience of situations having been the source of a past / previous problem,
— systematic analysis of all situations generating potential risk.

It is recommended to complete this approach with a warning system allowing to capture "weak signals" and detect those that could become risks for the programme and to treat them after validation.

The systematic analysis of risk generating situations, in terms of causes and effects, consists in asking oneself, for any specified objective in terms of costs, schedule and performance:

— which situations would result in not achieving this objective?

The answer to this question allows to identify the risks and to initialize the search for the causes by endeavouring to trace back to the root cause.

This analysis can be based on a typical list of risk areas (see Annex A): policy, financial, management, technical, … or on a typical list ordered by process.

The risks could be identified, sorted and grouped according to the processes and entities of the organisation.

Stage 3 Assessing

A risk is characterized in particular by its probability of occurrence and its impacts if it occurs.

Probability of occurrence of a risk can be determined by its causes, the combinations of these causes and their own probabilities of occurrence, and correlations between risks.

Impacts of a risk vary in severity according to specific objectives. A degree of severity is assigned to the risk as a result of all its impacts. Severity is assessed by taking into account effects on the programme objectives. This procedure may be extended to include the impacts on its company and its environment.

Impacts may be on costs, schedule, and performance (or other category: human resources, corporate image, technical and industrial resources).

The criticality of a risk is determined by combining the probability of its occurrence and the severity of its effects. The various risks are prioritized according to their criticality.

The criticality is a function of probability p and severity s. Generally, this function can be the product function of p by s.

Other criteria might be considered such as detectability or risk control level of each risk or time closeness to balance criticality.

a) Purpose of assessment

The purpose of assessment is to enable the prioritisation of risks. Prioritization allows defining risks to be treated by using specific actions for each risk.

Risks identified as having a potential impact on the objectives of the programme can if necessary then be assessed with respect to the strategic and operational objectives of the organisation/company in charge of the programme. It may also be necessary to define the exportability criteria of the programme risks to partners, customers and suppliers to ensure that exchange of information is sufficient to enable achievement of the objectives of the programme while preserving the interests of the company.

At the end of this process, it could be useful to organise and aggregate the risks in "macro-risks" either by process or organisational entity.

b) Types of assessments

Two types of assessments are possible: qualitative and or quantitative.

1) *Qualitative assessment: frequency and severity scale defined qualitatively*

The purpose of a qualitative approach is to monitor the critical aspects of the programme. This approach allows orientating the effort by:

— methodically prioritizing the potential risks of the programme;
— helping to set up the most appropriate treatment actions.

For each risk, it is recommended to assess (probability of occurrence, impact on cost and/or profitability, schedule, performance) a scoring level ranking from "very low" to "very high". Each level corresponds to a scale of value to be adjusted according to the company (see example of tables in Annex C).

2) *Quantitative assessment: frequency and severity scale defined quantitatively*

This approach makes the qualitative assessment more accurate and allows:

— a more accurate prioritization of risks,
— an assessment of the overall programme risk exposure.

See tables in Annex C.

It is better to define a scale with an even number of levels which prevents from the tendency to select the medium one.

c) How to prioritize the risks: determination of their criticality?

The criticality of each risk can be determined by combining both level of occurrence probability and highest impact level among costs, schedule, and performances.

A collegial strengthening made by a multi-disciplinary group of the listed risks is necessary at the end of stage 3 "Assessment" to take into account the high number of risks, processes, stakeholders and organisations associated which are concerned (see paragraph 5.3).

The general purpose of strengthening is to obtain a synthetic view of the "risk portfolio" (see Annex E) and to facilitate decision making at Management programme level.

Criticality scale: See Annex D.

d) Difficulty of the evaluation

The main difficulties are:

Concerning the **occurrence** assessment:

— few quantitative metrics available on the shelves.

To overcome this difficulty, we can encourage the use of conventional scale such as that presented in the Annexes C, D and E. Anyway, there shall be a common scale for all parties involved in the process. Where appropriate, we can define rules for transforming one scale to another.

— A common scale/rating depends on:
  — domain,
  — nature of the impact considered.

It is necessary to adapt the scales for each type of impact analysis. Annex C provides a mapping between the qualitative and quantitative approach for different types of impact.

Concerning the **severity** assessment:

— The risk rating in terms of severity depends on the level of responsibility in the organisation which can lead to a lack of coherence between the different rating scales.
— It is necessary to adjust the levels of severity depending on the relative level of the programme and its place in the organisational system in order to prioritize risks.

Concerning the **criticity** assessment:

— It is necessary to take particular care for the evaluation and exploitation in terms of action plan to criticality, where severity is very high and very low frequency of occurrence, or vice versa.

EXAMPLE Very low frequency of occurrence and financial impact or in terms of safety (of people and goods) major.

e) The concept of proximity and manageability

Proximity and manageability of a risk may be considered in weighing its criticality (combination of the probability of risk occurring and its impact [cost, schedule, performance, see paragraph c)].

The concept of proximity considers the difference between the estimated date of occurrence of the risk and the current date of the project. The concept of manageability takes into account the ability to control risk.

These concepts are useful to help how to prioritize the risks. It may be more urgent to address risk:

— with a date of occurrence in the short term rather than a risk with a date of occurrence in the longer term,
— easily controllable rather than a difficult one to control and/or requiring changes.

Stage 4 Actions

Stage 4 consists in:

— defining, with the agreement of the programme manager, the appropriate actions to reduce the criticality of each risk to an acceptable level with respect to the programme objectives.
— implementing the actions,
— checking their efficiency.

Budget and resources required for the Risk Management activity are defined at the start of the programme; it includes provision for risk mitigation activities and coverage for residual risk. This is under the responsibility of the programme manager.

Generally speaking, implementation of a cost/benefit oriented approach shall be required for assessing the efficiency of the risk treatment activities.

For each of these actions, one action owner, action name, deadline and state of progress of action shall be clearly defined.

Each action aims at, either:

— avoiding / terminating the risk,
— reducing its criticality by reducing its probability of occurrence and/or its impact(s),
— accepting the risk while continuing to monitor it,
— transferring or sharing the responsibility with a third party in order to globally optimize costs and schedule,
— or financing the risk (insurance or other provisions).

Risk treatment activities shall be included in the general programme planning.

The defined action plans shall not generate any new risks or constraints that are not acceptable.

Stage 5 Monitoring and Controlling

Data shall be recorded and updated in a risk sheet at all steps (identifying, assessing and acting) of risk Management (see example in Annex B).

Based on the Risk Management Plan, Risk Management activities are monitored during progress review meetings. This consists in reviewing risk reports analysis (see Annex F).

As the project is progressing, the risk portfolio shall be updated according to events which occur and any newly collected information.

Therefore, purpose of stage 5 is to:

— update initial list of risks (stage 2),
— refine assessment data (stage 3) of already known risks,
— check that treatment activities are carried out (stage 4) and assess their efficiency, update the list of actions,
— reassess the risk criticality accordingly (stage 3),
— monitor the occurrence of negative events and their consequences.

Risk monitoring can be based on different indicators and reporting statements related to the programme risk portfolio and they are defined in the Risk Management Plan:

— evolution of criticality at each update,
— number of risks per category,
— number of risks per entity,
— number of risks per criticality level,
— number of actions in progress, and number of actions actually closed,

— ...

Stage 6 Capitalizing

It is necessary to capitalize know-how and lessons learnt in the areas of Risk Management.

For this purpose, appropriate methodology and tools shall be set up.

NOTE Lessons learnt can contribute to the improvement / adaptation of the Risks Management process itself or its implementation.

Stage 7 Communicating

It is necessary to communicate the programme risks at all stages described above.

Indeed the notion of returning to the relevant stakeholders should be enhanced. It's not just the decision-making. This affects the involvement and motivation of the actors in the process. The feedback is critical.

This communication shall be:

— ascending and descending,
— between different stakeholders and actors involved in the programme.

This communication shall be organized, formalized and mapped.

5.2 Process synoptic

See Figure 2.

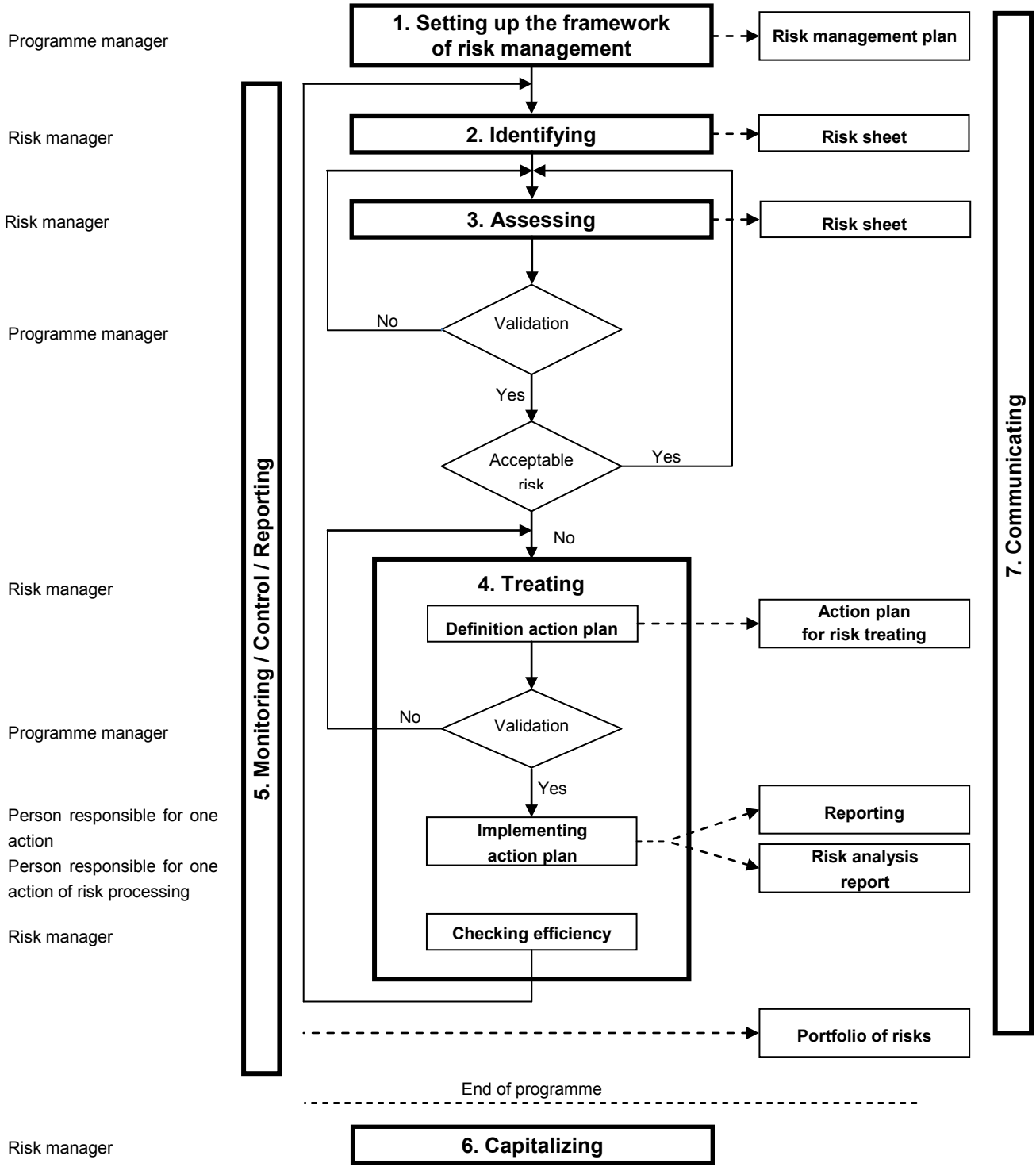

Figure 2 — Process synoptic

5.3 Consolidation of risk

As Programme risks are numerous, multi-process, multi-organisations, it is necessary to consolidate the risk to have a synthetic view on the “Portfolio Risk”, to facilitate decision-making and to capitalize and exploit lessons learned.

This consolidation can be done at the level of interaction between multiple programs (at the corporate level for example) or in different dimensions (for suppliers, by domain, process, ...).

This is a top-down approach that defines all the attributes that characterize the risk as “macro risk”.

The general methodology is to gather, classify risks in order to represent them as maps or synthetic reports.

In summary:

— Combinations, preliminary form of “macro risk”,
— Classification: per process, per organisational entity,
— Selection according to ranges of values: the importance, criticality,
— Production of maps or synthetic reports.

5.4 Maturity of programme Risk Management approach

It is recommended to establish a system for assessing process maturity Risk Management Programme.

This system meets various needs, including:

— Continuous Quality Improvement,
— Requirements made by some customers,
— Business Strategy.

This system is based on specific criteria (characteristics of the risk management process) and quantified (at maturity), based for example on a table, an evaluation grid, …

The criteria should cover their areas of coverage of relevant processes, processes of decision making, communication devices, level of involvement, use of tools, training level, ...

Annex G provides an example of a maturity evaluation grid.

6 Risk Management tools

Given the amount of data to be processed within the frame of programme Risk Management, it is recommended to set up a risk register that allows a permanent follow up of the risk portfolio.

This tool shall be simple, flexible (i.e. adaptable to the different types of programmes) and ergonomic (user-friendly).

It might be based on the general concept of “extended enterprise”, i.e. be capable to take into account the risks (related to the programme) of the company but also those of its partners and suppliers.

Its main functions are:

— easy adaptation to possible changes in organisation that may affect the programme,
— traceability of all Risk Management actions: alert, identification, assessment, processing (treatment, financing), associated action plan, and monitoring of action plan,
— history,
— record retention,
— lessons learnt restitution,
— reporting (risk analysis reports, situation report, …) and restitution, specifically adaptable to the needs for information of the various involved stakeholders,
— import and export of data in a commonly recognized and non proprietary format.

A specific interfacing might be specified for connection (with the necessary protections) with other risk management tools, in particular with the customer's one.

7 Awareness and Training

Awareness and training in risk management determine the efficiency of the process.

The actors to be educated and trained are all those involved in the conduct of programs: programme manager and technical managers, industrialization, production, purchasing, quality, customer support, finance, and subcontractors, contractors and suppliers.

Awareness and training action will be conducted by internal experts (e.g. risk manager) or outside the company.

It is also important that the process is evaluated and tracked to assess the effectiveness and efficiency, particularly in terms of improving the quality of training and staff involvement in the process of risk management.

8 Documentation

The documentation for the Risk Management Programme can be compiled and maintained in a folder: Programme Risk Analysis Folder.

This file includes:

— Plan Risk Management Programme, describing the procedure-specific Risk Management Programme,
— Risks Sheets which are recorded and maintained for each risk, all data concerning: warning, identification, assessment, treatment (sample risk sheet in Annex B),
— minutes of meetings of risk analysis,
— reports for risk analysis (see Annex F) and dashboards for the programme.

According to programme and/or organisations size, the risk sheet and risk analysis report could be the subject of only one document (see Annex E).

9 Opportunity management concept

9.1 Opportunity management process

The opportunity management process is similar to the one applied to risks.

9.2 Identification of opportunities

The identification of an opportunity, as for a risk, is made with reference to the objectives of the programme (policy, commercial, technical, management, …).

This identification can be based on the lessons learnt, the collective memory analysis or systematic analyses.

9.3 Assessment and prioritization of opportunities

An opportunity is characterized by the probability of its occurrence and its impact.

The impact of an opportunity is beneficial to the programme and the schedule and over cost notions are replaced by the early review (schedule) and profit (cost) notions.

Probability assessment method is identical to that applied for risks. The impact assessment method is symmetrical to that used for risks.

The criticality notion is replaced by the notion of opportunity level and it is obtained as for the risks by the combination of impacts and probability.

The opportunities to be addressed as a priority are those presenting the highest opportunity levels for the purpose of improving upon the programme objectives. The highest opportunity level corresponds to a high probability of occurrence and high positive impacts.

9.4 Opportunity treatment

Aim of opportunity treatment, unlike that of risk treatment, is to maximize the programme opportunity level by trying to increase the probability of its occurrence and/or of its impacts.

9.5 Secondary risks

Opportunity treatment can involve secondary risks occurring in the programme. In case they cannot be treated, the programme manager shall then decide whether he/she accepts the risks being introduced by the opportunity before launching its treatment. This decision will be governed by the sensitivity to risks of the organisation in charge of the programme.

Annex A
(informative)

List type per category

To highlight the risks associated with the programme more easily, identification may be assisted by the use of a standard list. The list proposed is not exhaustive, and can be adapted to each programme. The risks in this list are identified according to the constraints related to the product and/or organisation. They are grouped into categories (or by processes) in the following table:

Table A.1

Category of risk		Risk examples
Policy	Policy	Adverse change in government or customer policy Schedule constraints that are imposed, unrealistic or without margin
	International	Adverse protectionist measure
	Cooperation	Lack of reserves in the event of withdrawal of a nation or an industrial partner
Corporate image	Fame	Association of corporate image with acts detrimental to
Sales	Sales	Evolution of customer requirements
	Marketing	Market incorrectly evaluated Market turnaround Customer needs misunderstood
Finance	Finance	Unrealistic estimation of programme costs Adverse variation in rates of exchange Profitability of programme
Contractual	Partner	Legal recourse with respect to a deficient partner impossible Partners failure/defect Partners imposed on programme
	Contract	Inadequate, incomplete or imprecise specification requirements Contractual commitments difficult to meet within the programme context
	Customer	Programme stopped before scheduled deadline or contract price re-oriented downwards
Legal	Legal statutory	Legal commitments difficult to meet within the programme context Stiffening or evolution of a legal constraint during programme

Category of risk		Risk examples
Provisioning	Purchase	Equipment not available Supplier delay Prices incompatible with budget Price increase
	Supplier	Insufficient capability for programme constraints Failure/defect of a "Single-source" provisioning.
Management	Industrial organisation	Industrial organisation unsuitable, ill-defined or imposed Restructuring / reorganisation
	Structuring of the programme	Work breakdown structure not clearly defined Decision making centre ill-defined Programme Management specification incomplete
	Planning	Schedules for the various stakeholders inconsistent
	Skills and competences	Loss of skills / competences
	Culture	Communication difficulties related to the plurality of cultures
	Communication	Methods and tools of communication Working language not mastered
	Resources	Badly assessed, insufficient or unavailable means
	Interfaces	Organisation interfaces and decisions badly defined
	Quality assurance	Proofs to be provided not clearly defined
Technical	Technical	Technology readiness level insufficient
	Scientific	Principles or concepts proposed not validated
	Requirement	Product does not fully meet programme requirements Product does not satisfy end user
	Tests	Test representativeness difficult to demonstrate or to obtain (RAMS, …)
	Industrial	Production logistics difficult to set up
	Justification	Requirements difficult or even impossible to demonstrate (RAMS, …)
	Simulation	Simulation model not validated for conditions of use
	Supplier	Customer requirements incorrectly understood
	Hypotheses	Used input data is incorrect or incomplete
Obsolescence		Are concerned: components, tools, skills and know-how
Security	Confidentiality	Protection rules ill-defined Level of restrictions unsuited
Safety	Product	Late, partial new design to satisfy safety requirements
Humans	Human relationships	Work conflict Objectives and stakes insufficiently shared
	Training	Unsuffisant training
	Skills	Skills used too remote from the skills required Loss of competency

Annex B
(informative)

Example of risk sheet

Stakeholder: (company)	**Risk sheet**			**Risk number:** (as per list of risks)
Programme:		**Concerned process**		
Risk description: (Undesirable event envisaged - Causes & Effects on programme)				
Causes :				
Assessment				
Probability of occurrence		**Severity**		
Criticality				
Actions adopted:	Person responsible	Due date	Implementation date	**Comments**
Action plan accepted by: (programme manager)				
Post Risk Mitigation Assessment :				
Residual Probability of occurence		**Residual severity**		
Residual criticality after the actions implemented and completed				
Decision: (Risk closure evidence) Risk reduced on		Programme manager signature:		

Annex C
(informative)

Example of qualitative and quantitative assessments

See Table C.1 to Table C.6.

Table C.1

QUALITATIVE ASSESSMENT		**QUANTITATIVE ASSESSMENT**				
Level	**Scoring**	**Probability of occurrence**				
Very low	**1**	Probability:		P	≤	10 %
Low	**2**	Probability:	10 % <	P	≤	30 %
Medium	**3**	Probability:	30 % <	P	≤	60%
High	**4**	Probability:	60 % <	P		

Table C.2

QUALITATIVE ASSESSMENT		**QUANTITATIVE ASSESSMENT**				
Level	**Scoring**	**Schedule impact on project (T = duration of project)**				
Very low	**1**	Schedule:		I_T	≤	2 % T
Low	**2**	Schedule:	2 % T <	I_T	≤	10 % T
Medium	**3**	Schedule:	10 % T <	I_T	≤	20 % T
High	**4**	Schedule:	20 % T <	I_T		

Table C.3

QUALITATIVE ASSESSMENT		**QUANTITATIVE ASSESSMENT**				
Level	**Scoring**	**Cost impact on project (C = Cost of project)**				
Very low	**1**	Cost:		I_C	≤	0,1 % C
Low	**2**	Cost:	0,1 % C <	I_C	≤	0,5 % C
Medium	**3**	Cost:	0,5 % C <	I_C	≤	1 % C
High	**4**	Cost:	1 % C <	I_C		

Table C.4

QUALITATIVE ASSESSMENT		QUANTITATIVE ASSESSMENT
Level	**Scoring**	**Performance impact**
Very low	**1**	Several desirable performances impacted
Low	**2**	Several significant performances impacted
Medium	**3**	Significant function degraded or not achieved
High	**4**	At least one essential performance impacted

Complement about the notion of proximity and control:

Table C.5

QUALITATIVE ASSESSMENT		QUANTITATIVE ASSESSMENT				
Level	**Scoring**	**Proximity (in days)**				
Low	**0,8**	Proximity:	180	<	Px	
Medium	**1**	Proximity:	60	<	Px	≤ 180
High	**1,2**	Proximity			Px	≤ 60

Short term risk should be treated in priority (highest scoring).

Table C.6

QUALITATIVE ASSESSMENT		QUANTITATIVE ASSESSMENT	
Level	**Scoring**	**Manageability**	
Low	**0,8**	Difficult:	Requires many changes in the project baseline
Medium	**1**	Medium:	Requires some changes in the project baseline
High	**1,2**	Easy:	Requires little or no changes in the project baseline

Changes on the project reference may involve aspects like organisational structure, management processes implemented and practical, make or buy decision, use of resources in the broadest sense, maturity of the solution, …

Annex D
(informative)

Example of 3 colour code criticality and acceptability matrix: general risk mapping

EXAMPLE: Analysis of impacts in terms of costs with the eventuality as criterium:

Table D.1 — Example of risk mapping

IMPACT	**EVENTUALITY**			
	VERY LOW	**LOW**	**MEDIUM**	**HIGH**
CRITICAL > x M €				
SIGNIFICANT y M € to x M €				
LIMIT z € to y M €				
LOW < z €				
EVENTUALITY	**VERY LOW**	**LOW**	**MEDIUM**	**HIGH**
OCCURRENCE	**Very rare**: > x years	**Rare**: y to x years	**Regular**: z to y years	**Frequent** : < z year
PROBABILITY	**Very unlikely**	**Unlikely**	**Possible**	**Probable**

Acceptability (Colour code):

— **Red** : very critical: to address in priority
— **Orange** : significant: to address urgently
— **Green** : to monitor

Annex E
(informative)
Example of Risks Portfolio

- Concerned type risk:
- Concerned process:
- Concerned system:

Risk sheet No. ..... Programme: ..... Date: .....

Risk Owner (Company / Service / Leader): .....

Risk No. xxx	Risk Description	Impact Description	Cause(s)	Risk **Criticality** Assessment *				Treatment action (if needed)	Action owner	Action status	Launch action date	**Residual Criticality**			
				P Probability	**S Severity**	**Other Attribute**	**C Criticality**				Planned closure date	P	S	OA	**C**
						...								...	

* The criticality can be expressed as the product of identified attributes:

Criticality = Probability × Severity × Other(s) Attribute(s).

Each of the attributes of risk (see paragraph 5.1 Stage 3) is quantified by a value (e.g. 1-4). Attributes can optionally be weighted in the calculation of criticality.

It is recommended to define a threshold value beyond which criticality of risk reduction actions are needed (For example, 5 % to 20 % of the maximum values of attributes to be specified according to programme objectives).

Action plan agreed by (Designated):	
Decision: (Justification for the closing of the risk / acceptance of residual risk) Risk mitigated on: Programme Manager Visa:	

Annex F
(informative)

Risk assessment report

Programme: .....Date: .....

		Risk description	Impact description	Treatment action	Responsible for action	Status of action	Action: start date Action: estimated deadline
Risk No. 1	Probability:			— 1 : — 2 : — ... — N :			
	Severity:						
	Other Attribute						
	Criticality:						
Risk No. 2	Probability:			— 1 : — 2 : — ... — N :			
	Severity:						
	Other Attribute						
	Criticality:						
Risk No. n	Probability:			— 1 : — 2 : — ... — N :			
	Severity:						
	Other Attribute						
	Criticality:						

Criticality can be expressed as:

Criticality = Probability × Severity × Other Attribute

Probability, Severity and Other attribute can be quantified on a scale ranking from 1 to 4.

Annex G
(informative)

Maturity of programme risk management: assessment criteria

G.1 Introduction

The overall level of maturity depends on the weighting of each area and scores for each of them.

In the following annex, acronyms used are as follows:

— RM: Risk Management
— RMP: Risk Management Process

G.2 The risk management process is documented and mature

The entity has a RM process in place that includes elements of identification, designation of roles and responsibilities, characterization, prioritization, mitigation plans, mitigation actions and risks monitoring.	1
The entity has a documented Risk Management Plan. The Plan defines roles and responsibilities for all stages of the RMP, including management of the entire process.	2
It is proved that the RMP has been implemented for some time and proved to be efficient.	3
The RMP has matured and improvements have been made both from the process itself and from data derived therefrom.	4
RMP is continuously improved based on feedback from the implementation of the RMP, quantitative measures of performance and performance targets.	5

G.3 The risk management process is thorough

Risks can be identified at each level of the structure of the entity. The risk assessment is based on the analysis of the probability of occurrence on one hand and of impacts on the other one.	1
The RMP requires impact assessment related to cost, schedule and performance (performance includes everything that is not cost and delay, ie security, operational, support, programme management).	2
The RMP requires plans to reduce risks for formal risks rated "medium" and "high".	3
The RMP requires the application of formal and regular reviews.	4
The RMP requires fallback plans or alternative plans for the risks rated "high".	5

G.4 Effective tools are used to implement the process

RM Plan is available online.	1
Summary risk data are available online. The RMP uses standard office computer software to collect and manage data and may include email communications and / or storage server.	2
The detailed risks data are available online.	3
Risk management data are available online through an interactive database with search and data management limited capabilities.	4
Risk management data are available and can be captured and processed through an online interactive database having automated management functions.	5

G.5 Extent of use of RMP

Risks are mainly identified by a team dedicated to basic risk or by the management team.	1
Risks are identified by a variety of individuals and teams.	2
The RMP is implemented by several teams and functions.	3
The RMP is implemented by most teams and functions.	4
The RMP is implemented by all teams and functions.	5

G.6 Risk review and ability to increase the level of decision

Formal review and increasing team level for risk assessment are sporadically performed.	1
Formal review and increasing team level for risk assessment are occasionally carried out.	2
Formal review and increasing team level for risk assessment are periodically carried out.	3
Formal review and increasing level team for monthly or weekly risks assessment.	4
–	5

G.7 Risk information in management programme reviews

RM data were reviewed by the Programme management within a structured forum where decisions are made and actions decided. Sporadic risk review.	1
RM data were reviewed by the Programme management within a structured forum where decisions are made and actions decided. Occasional risk review.	2
RM data were reviewed by the Programme management within a structured forum where decisions are made and actions decided. Periodic risk reviews.	3
RM data were reviewed by the Programme management within a structured forum where decisions are made and actions decided. Monthly or weekly risk review.	4
The programme management uses RMP data in various forums to drive progress, make decisions and assign action on critical items.	5

G.8 The programme management uses the RMP

The RM is used by some programme management teams or a the general management level.	1
–	2
The RM is used by several programme management teams.	3
The RM is used by most programme management teams.	4
The RM is used by all levels of programme management.	5

G.9 Risks and issues are coordinated

Risks are identified and managed separately from other issues / problems of the programmes.	1
–	2
RMP is similar to the process dedicated to the management of programmes issues / problems.	3
Programme risks and issues / problems are identified and managed in a coordinated manner, but separately.	4
Programme risks and issues / problems are identified and managed by a single management system.	5

G.10 The risk mitigation plans are part of programme schedules

The risk mitigation plans are implemented and managed separately from other plans.	1
–	2
The risk mitigation plans are implemented and managed as part of the programme schedules.	3
The risk mitigation plans are implemented and managed as part of the basic performance of the programme.	4
The risk mitigation plans are directly related to events in a system of automatic planning.	5

G.11 Customers are involved in the RMP

The process takes into account the customers risks.	1
The RMP includes customer data.	2
The RMP is similar to the RMP of the rank 1 customer. The main customers of rank 2 are informed on the arrangements on risk.	3
The RMP is integrated with the RMP of the rank 1 customer. The main customers of rank 2 are consulted concerning risk assessment and mitigation.	4
The contractor and rank1 customer use a single integrated RMP. The main customers of rank 2 are actively involved in assessing and reducing risks.	5

G.12 Suppliers are involved in the RMP

The RMP takes into account the risks of suppliers.	1
The RMP includes data of suppliers.	2
RMP is similar to the RMP of major suppliers.	3
RMP is integrated with the RMP of major suppliers.	4
The contractor and major suppliers use a single integrated RMP.	5

G.13 Risk data are available on the Programme Management Information System

Risk data are available separately from the Programme Management Information System.	1
–	2
Summary risk data are available on the Programme Management Information System.	3
Summary and detailed information about programme risks are available on the Programme Management Information System.	4
Summary and detailed information on programme risk and team are available on the Programme Management Information System.	5

G.14 Programme staff have been trained in RM

Training in RM is available in an informal way.	1
RM training is periodically provided by the responsible of business processes.	2
RM training is specific to the programme and provided by the coordinators of the programme risks.	3
A process is in place to form the new RM programme manager. A process training specific to the programme is available for customers and suppliers.	4
Most members and persons in charge of the programme have been trained in RM. A training process is permanently offered to programme members, customers and suppliers.	5

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