SLOVENSKI STANDARD
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Aeronavtika - Vodenje programov - Navodilo za obvladovanje tveganja

Aerospace series - Programme Management - Guide for the risk management

Luft- und Raumfahrt - Programme Management - Richtlinien zur Durchführung des Risikomanagement

Série aérospatiale - Management de Programme - Recommandations pour la mise en oeuvre du management des Risques

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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of an identical text or by endorsement, at the latest by November 2016, and conflicting national standards shall be withdrawn at the latest by November 2016.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):

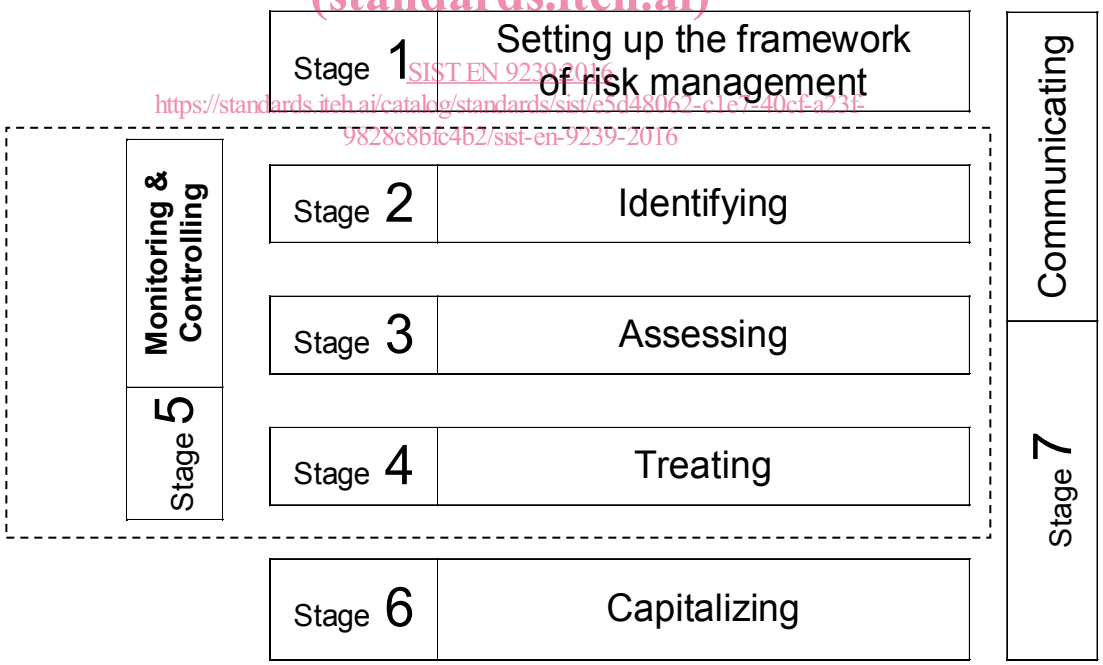

Figure 1 — Main stages of risk management

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.