(Company logo)

Xyz Air

SMS Manual

ABOUT THIS MANUAL

This manual has been created by the EASA – EHSIT – Specialist Team Ops. & SMS to give to small/medium operators a reference in order to easily create their own SMS manual and organisation.

This manual, at the time of issue, is compliant with ICAO SARP and with EASA requirements about the Safety Management System.
Because of continuous changing of the international references about the Safety Management System, it is the responsibility of the operator to change this manual in order to comply with the actual National and European regulations.

This manual has been created by a team of professionals, who work on safety management, coming from different typology of aeronautical industries (operators, manufacturers, pilot associations, National Aeronautical Authorities, technology industries, etc.).
Even if the manual reflects the needs of a small/medium operator, nevertheless the whole manual **MUST BE REVIEWED, CORRECTED AND SIZED TO OPPORTUNELY REFLECT THE COMPANY COMPLEXITY AND NEEDS**.

THIS MANUAL IS NOT INTENDED TO BE JUST APPLIED AS IT IS.

The user must understand that having a complete SMS manual does not means to have an SMS organisation in place. The manual is just a reference document that describes an existing and working system. This system must be created through an adequate implementation plan which requires the commitment of the management and the personnel, safety training, creation of the safety documents, creation and implementation of procedures, studies about the initial real level of the Company safety and organisation (gap analysis), studies of the actual risks inside the Company operating missions (case studies), and so on.

On the other hand, this manual has been intended to help the operator to create his own SMS manual without spending too much time in developing a brand new document, but opportunely changing an existing one.

This manual comes with a simple yet useful database developed by the Safety Department of EUROCOPTER.

The Specialist Team Ops. & SMS
EASA – European Helicopter Safety Implementation Team (EHSIT)

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ACCOUNTABLE MANAGER ENDORSMENT

SMS Manual DISTRIBUTION LIST

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SMS Manual RECORD OF REVISIONS

First issue 01.01.2012

Signature will certify that this manual has been correctly updated

REV. Nr.	DATE	CHAPTER	OBJECT	PAGE	INSERTED	
					DATE	BY

SMS Manual TEMPORARY REVISION
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T.R. Nr.	DATE	CHAPTER	OBJECT	PAGE	INSERTED	
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GENERAL INDEX

0. ADMINISTRATION AND CONTROL OF THE SMS MANUAL

0.1 SMS Manual structure

The SMS Manual is the document that describes the organisation and the procedures for the management of the safety programme inside the Company.

The Manual is composed of the following chapters:

0 ADMINISTRATION AND CONTROL OF THE SMS MANUAL
Gives indication about the structure of the manual.

1 FOREWORD
Gives initial information about the origin of the manual.

2 DEFINITIONS AND GLOSSARY
Gives a list of the most common definitions and abbreviations used inside this manual.

3 SAFETY POLICY AND OBJECTIVES
Gives the Company Safety Policy and Objectives that are set forth and endorsed by the Accountable Manager.

4 APPOINTMENT OF KEY SAFETY PERSONNEL
Gives indications about the roles and the accountabilities of the key personnel related to the safety management.

5 SMS DOCUMENTATION
Gives information about the document used by the safety organisation and the procedures to maintain them updated.

6 SAFETY MANAGEMENT
Gives the description of the safety management organisation and the related procedures.

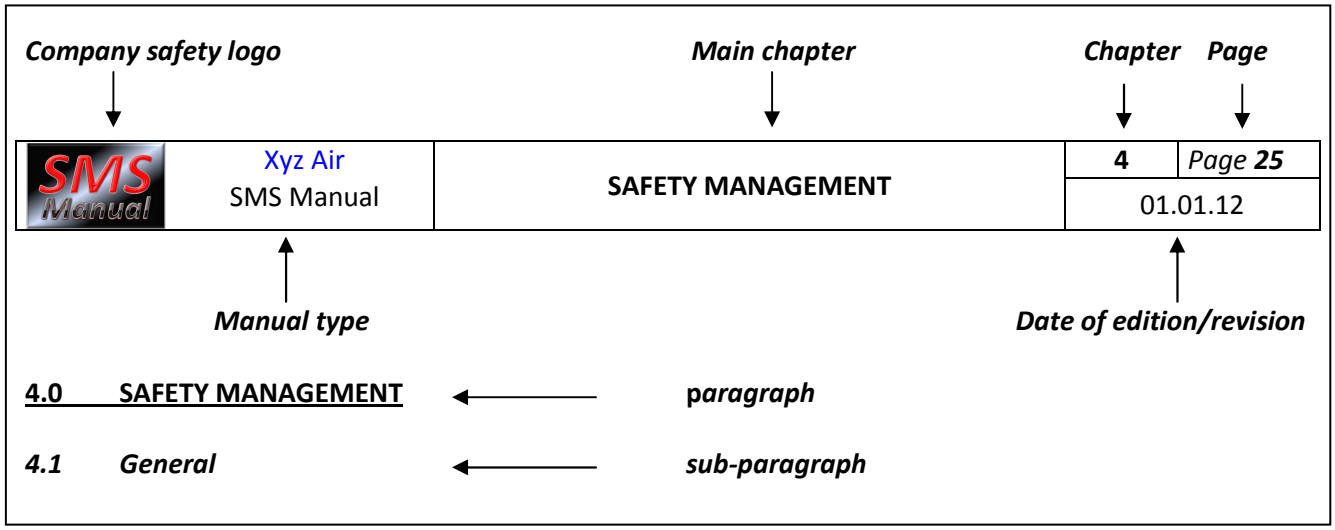
7 SAFETY ASSURANCE
Gives the description and the procedures of the assurance part of the safety management.

8 PROMOTION - TRAINING - COMMUNICATION
Gives information about the promotion, the training and the communication procedures related with the safety programme.

APPENDIXES
Reports the information and the working documents used in the management of the safety. These documents are likely to be changed more often than the SMS Manual, so an update to the annexes will not require the change and subsequent approval of the entire manual.

0.2 Amendment and revision of the SMS Manual

The contents of the SMS Manual, and its updates, are created and maintained by the Safety Manager. The issue of such manual and revisions will be done by the Operation Post Holder.
The SMS Manual is divided into chapters (subdivided, where appropriate in sections), Sections, Subsections, and pages numbered as shown below:



All information is published on white pages. The last update of each page can be checked on the "List of Effective Pages (LEP)" section at the beginning of the Manual.
Information of an urgent nature may be issued as "Temporary Revisions (TR)" and printed on yellow pages: they have a temporary nature and must be eliminated as soon as they are not more relevant or they have been inserted into the manual as a normal update. Their validity is reported on the section "Temporary Revisions".
Handwritten amendments or graphical formats different from the one provided are not permitted, unless safety reasons dictate so.
A black bar alongside the page will identify the latest review changes.
Each manual holder is responsible for his/her copy of the SMS Manual:

- To verify the completeness and validity of the updates received;
- To include the last reviews in a correct and timely way;
- To promptly request missing parts;
- To verify each review at the manual and be aware of its content.

1 FOREWORD

The Safety Management System Manual (**SMSM**) is a communication tool which addresses all Company personnel and is the reference for the safety program.

Safety is increasingly considered in the management of risks category.
For the purpose of this manual, the SMS will carry the following definition:

Safety Management System (SMS): a structured approach to safety management, which encompasses the organizational structures, responsibilities, policies and procedures necessary in order to ensure safe implementation and exploitation of aircraft.
Within the framework of the SMS, we refer to:
Safety: situation in which the risk of human injury or material damage is within an acceptable limit and maintained at this level or at a lower level through a continuous identification process. This process identifies the dangers and the management of risk (Doc 9859 of the ICAO).

This manual conforms to annex 6 of the ICAO 1st part « *Operation of Aircraft* » – 3rd part « *International Operations- Helicopters* ».

2 DEFINITIONS AND GLOSSARY

2.1 Definitions

Accident

An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

a) a person is fatally or seriously injured as a result of
   - being in the aircraft, or
   - direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
   - direct exposure to jet blast,

   except when the injuries are from natural causes, self inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew: or

b) the aircraft sustains damage or structural failure which:
   - adversely affects the structural strength, performance or flight characteristics of the aircraft, and
   - would normally require major repair or replacement of the affected component,

   except for engine failure or damage when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or

c) the aircraft is missing or is completely inaccessible.

Accident Outcome

An outcome that involves actual physical harm or damage. It includes outcomes that do not meet the ICAO annex 13 definition of an 'accident', but still involve actual physical harm or damage.

Accident Scenario

The imagined progression from the actual outcome or the triggering event/hazard release to the accident outcome.
One Safety Issue (or sub-issue) may relate to several accident scenarios. For example, the Safety Issue "demanding approach to airport X" may contain two scenarios, one leading to CFIT and another to a very hard (crash) landing. Usually a Safety Issue cannot be directly risk assessed, but the related Accident Scenarios can.

Consequence

The degree of injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function arising from an outcome. Consequences have a magnitude.

Danger

all the conditions, events or circumstances susceptible to provoke an accident.

Event Risk Classification

The initial risk classification of operational safety events, using the risk matrix.

Gravity

characteristics impacting security.

Hazard	A condition, object, activity or event with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.
Management of Change	The assessment of risk as a result of a predicted/planned change to the operation together with the consequential actions taken, ensuring the safety of the operation due to the change.
Management of risk	The management of risk consists in identification, and analysis of risks followed by eliminating these risks or reducing them to a level which is acceptable or tolerable.
Operational Risk Assessment	Assessment of operational risks in a systematic, robust and intellectually cohesive manner.
Probability	Calculation of occurrences per population.
Register	Documented record of all information concerning Safety Issues, assessed risk levels, the agreed actions to reduce risk levels and information on their progress.
Risk	A state of uncertainty where some of the possibilities involve a loss, catastrophe, or other undesirable outcome. Probability of an accident x losses per accident (classic engineering definition). The predicted probability and severity, of the consequence(s) of hazard(s) taking as reference the potential outcomes.
Risk Controls (Barriers and Mitigation)	A system, activity, action or procedure that is put in place to reduce the risks associated with a hazard. Mitigation may include: - elimination of the hazard (preferred), - reduction in the frequency of the hazard (barriers), - reduction in the likelihood of the outcomes of the hazard (outcome mitigation), - reduction of the severity of the outcomes of the hazard (consequence mitigation).
Risk Value (Risk Index Value)	A numerical weighting given to each square of a risk matrix to enable differentiation of risk for the purpose of quantitative analysis.
Safety Analyst	A person with the experience, training, responsibility and authority to perform risk assessments and to analyse the safety database for Safety Issues.
Safety Assessment	A risk assessment focusing on a predicted or planned change to a specific part of the operation.
Safety Case	A Safety Assessment on an existing part of the operation in order to demonstrate that the safety risk is at an acceptable level.
Safety Event	A failure condition, causal factor, threat or precursor event which in isolation or in combination with other safety events could result in an undesirable event.

Safety Issue	A manifestation of a hazard or combination of several hazards in a specific context. The Safety Issue has been identified through the systematic Hazard Identification process of the organisation. A SI could be a local implication of one hazard (e.g. deicing problems in one particular aircraft type) or a combination of hazards in one part of the operation (e.g. operation to a demanding airport).
Safety Management System (SMS)	A Safety Management System is a systematic, explicit and proactive process for managing safety that integrates operations and technical systems with financial and human resource management to achieve safe operations with as low as reasonably practicable risk.
Safety Performance Indicators	Specified metrics used to measure the safety performance of an operation or organisation.
Safety Performance Monitoring	The process by which the safety performance of the organisation is verified by comparison with the safety policy and approved safety objectives.
Safety Risk Management	The identification of hazards associated with the day-to-day operations of an organisation, or associated with changes to the operations of an organisation; the assessment of the risks associated with those hazards; and the implementation and management of measures to reduce those risks to an acceptable level (hazard removal; or the application of barriers and/or mitigations – i.e. risk control).
Triggering Event	The event or condition, which triggers the accident scenario by introducing the initial risk factor. Whether the sequence will then escalate into an UOS or Accident will depend on the avoidance and recovery barriers.
Undesirable Event	A stage in the escalation of an accident scenario where the accident will occur, unless an active recovery measure is available and is successfully used.
Undesirable Operational State (UOS)	The stage in an Accident Scenario where the scenario has escalated so far that (excluding providence) the accident can be avoided only through successful recovery measure(s). Risk Controls prior to the UOS are part of Avoidance and post-UOS are part of Recovery.

2.2 Glossary

ADREP	Accident/incident data reporting
AIRPROX	Aircraft proximity
ALARP	As low as reasonably practicable
ALoS	Acceptable level of safety
AMC	Acceptable Means of Compliance
AOC	Air operator certificate
ASR	Air safety report
CAA	Civil Aviation Authority
CEO	Chief Executive Officer
CFIT	Controlled flight into terrain
CM	Compliance Monitoring
CMC	Crisis management centre

CMM	Compliance Monitoring Manager
CRM	Crew resource management
CVR	Cockpit voice recorder
EASA	European Aviation Safety Agency
EASA	European Aviation Safety Agency
ECAST	European Commercial Aviation Safety Team
EHEST	European Helicopter Safety Team
ERP	Emergency response plan
ESSI	European Strategic Safety Initiative
FDA	Flight data analysis
FDM	Flight data monitoring
FDR	Flight data recorder
FOD	Foreign object (debris) damage
ICAO	International Civil Aviation Organization
ICAO	International Civil Aviation Organisation
NPA	Notice of Proposed Amendment
QA	Quality assurance
QC	Quality control
QMS	Quality management system
SA	Safety assurance
SAG	Safety Action Group
SAG	Safety action group
SHEL	Software/Hardware/Environment/Liveware
SMS	Safety Management System
SMS	Safety Management System
SMSM	Safety Management System Manual
SMSM	Safety Management System Manual
SOPs	Standard operating procedures
SRB	Safety Review Board
SRB	Safety review board
SRM	Safety risk management
SSP	State safety programme
TLH	Top level hazard

2.3 List of associated reference documents

- ICAO Doc 9859 – Safety Management Manual (SMM) – Second Edition 2009
- Annex 6 of the ICAO Part III appendix 4 « Framework for Safety Management System » and Attachment F « Flight safety documents system ».
- The regulation EU 996/2010 on surveys and prevention of accidents and incidents in civil aviation (replaces the directive 94/56/EC).
- DIRECTIVE 2003/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 June 2003 on occurrence reporting in civil aviation
- *Regional NAA documentation (as applicable)*

3 SAFETY POLICY AND OBJECTIVES (put your own Company statements)

3.1 The commitment of the Xyz

Xyz strategy development is based on:

- ***Safety***
- ***Excellence***
- ***Innovation***

Safety Management is one of the main concerns for the confidence of our customers and it is our priority for the activities of Xyz Air.

Xyz organization management is based, firstly on the Safety Management System, through procedures set up by our Safety Manager. This is an integral part of our modus operandi.

Safety and effectiveness of the encompassing procedures are an integral part for the consistency of our Compliance Monitoring organization and above all for the adhesion of our staff to these company values.

Safety is the paramount value; it is and must remain a concern to be applied at all times by all Xyz staff, regardless of their position in the company. All staff will remain vigilant in order to identify and overcome any potential risk to safety

My commitment, as Xyz accountable manager, is to take all measures to develop and improve safety in all areas of our activity.

My commitment, as Xyz accountable manager, is to implement our SMS as soon as possible in order to demonstrate my commitment to take every measure to develop and improve safety.

The SMS represents an overall risk management process which is both explicit and global. Each Xyz department systemically applies safety to the procedures involved in their organization, thus implying integration in every daily activity. Each member of staff during their function will spontaneously and immediately communicate all information representing a potential risk to safety.
To encourage this feedback, I promise not to take any action against a person who reports to his hierarchy an identified risk to Safety.

My goal is to ensure proactive management in order to reduce risk to an acceptable level of safety Xyz will apply these rules and endeavour to improve safety constantly.

I count on the personal commitment of everyone working in our Company to promote safety.

The Accountable Manager

3.2 Safety Policy

SAFETY POLICY STATEMENT

Safety is one of our core business functions. We are committed to developing, implementing, maintaining and constantly improving strategies and processes to ensure that all our aviation activities take place under a balanced allocation of organizational resources, aimed at achieving the highest level of safety performance and meeting national and international standards, while delivering our services.

All levels of management and all employees are accountable for the delivery of this highest level of safety performance, starting with the [chief executive officer (CEO)/managing director/or as appropriate to the organization].
Our commitment is to:

- **Support** the management of safety through the provision of all appropriate resources, that will result in an organizational culture that fosters safe practices, encourages effective safety reporting and communication, and actively manages safety with the same attention to results as the attention to the results of the other management systems of the organization;
- **Enforce** the management of safety as a primary responsibility of all managers and employees;
- **Clearly** define for all staff, managers and employees alike, their accountabilities and responsibilities for the delivery of the organization's safety performance and the performance of our safety management system;
- **Establish and operate** hazard identification and risk management processes, including a hazard reporting system, in order to eliminate or mitigate the safety risks of the consequences of hazards resulting from our operations or activities to a point which is as low as reasonably practicable (ALARP);
- **Ensure** that no action will be taken against any employee who discloses a safety concern through the hazard reporting system, unless such disclosure indicates, beyond any reasonable doubt, an illegal act, gross negligence, or a deliberate or willful disregard of regulations or procedures;
- **Comply** with and, wherever possible, exceed, legislative and regulatory requirements and standards;
- **Ensure** that sufficient skilled and trained human resources are available to implement safety strategies and processes;
- Ensure that all staff are provided with adequate and appropriate aviation safety information and training, are competent in safety matters, and are allocated only tasks commensurate with their skills;
- **Establish and measure** our safety performance against realistic safety performance indicators and safety performance targets;
- **Continually improve** our safety performance through management processes that ensure that relevant safety action is taken and is effective; and
- **Ensure** externally supplied systems and services to support our operations are delivered meeting our safety performance standards.

(Signed)

_____

CEO/Managing Director/or as appropriate

This safety policy will be updated regularly (recommended every two years).

3.3 Non punitive reporting policy statement

Xyz NON PUNITIVE REPORTING POLICY

Xyz is committed to the safest corporate operating standards possible. To achieve this, it is imperative to have uninhibited reporting of all accidents, incidents and occurrences that may compromise the safe conduct of our operations. To this end, every employee is responsible for communicating any information that may affect the integrity of safety and health in all Company's activities. Such communication must be completely free of any form of reprisal. The only purpose of event reports it's the accident and incident prevention and not aim to determine fault or responsibility.

Xyz will not take disciplinary action against any employee who discloses an incident or occurrence involving safety. This policy shall not apply to actions involving illegal act or a deliberate or wilful disregard of promulgated regulations or procedures.

Our method of collecting, recording and disseminating information obtained has been developed to protect, to the extent permissible by law, the identity of any employee who provides safety information.

I urge to use our safety programme to help **Xyz** become a leader in providing our customers and employees with the highest level of flight safety.

IN FAITH

SIGNED
ACCOUNTABLE MANAGER

3.4 Safety Objectives

Safety Objectives are defined by the Safety Review Board and updated regularly. The Safety Objective document is a separate document, endorsed by the Accountable Manager and kept separate to the SMS manual, yet linked to it.

All Safety Objectives must be measurable and reviewable within the capability of the Company organisation.

The Safety Objectives model is reported in Annex B.

These are some examples of indicators:

1. number of accidents per month
2. number of incidents per flight hour per month
3. number of incidents per type of aircraft per month
4. reparation number and nature of incidents (OPS, Technical, etc)
5. number of incidents per flight phase
6. synthesis of analysis of return information per SHELL analysis
7. number of improvement actions taken following this return information.
8. treatment rate of these actions
9. number of analysis of risks
10. number of study report
11. number of proactive actions performed
12. follow up of action plan to identify dangers and management of risks
13. number of modification made in procedures following the acknowledgement of safety information
14. number of requests made for modification of technical documents
15. number of meetings concerning security
16. number and nature of SV Flight Safety Flashes diffused
17. number of Flight Safety SV information diffused
18. number of crash exercises (or similar) made (one major exercise every 2 years)
19. HUET courses followed by flight crew.

The calculated level of safety comes from all the indicators in their completeness. The level cannot be evaluated on a single indicator or just a few of them.
The indicators and the level of safety must be regularly reviewed, checked and eventually redefined.

4 APPOINTMENT OF KEY SAFETY PERSONNEL

The responsibilities of the management and the personnel of Xyz are reported in:

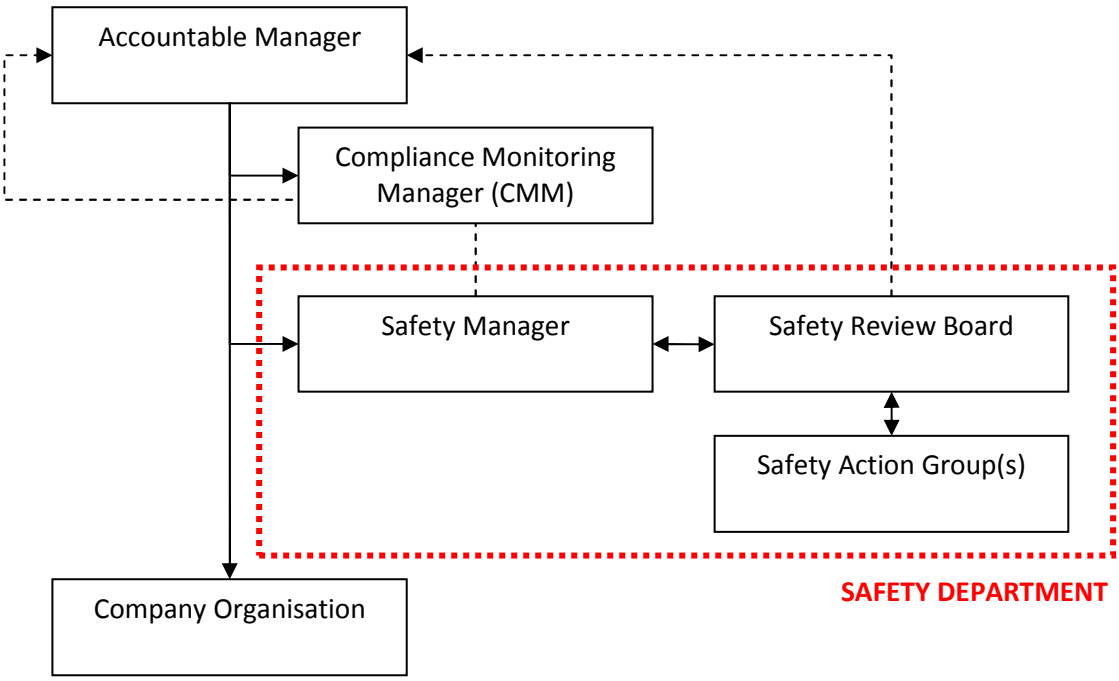
- the Compliance Monitoring manual,
- the manual of the maintenance (CAME)
- the operations manual
- the Compliance Monitoring processes set forth by the Compliance Monitoring System.

The Accountable Manager, together with the Senior Management team, set the standard for the organisation's safety culture. Without this commitment and leadership, SMS will be ineffective.

4.1 Safety Department

The Safety Department is composed by:

- Safety Manager
- Safety Review Board
- Safety Action Group(s)



4.2 Accountable Manager

The Accountable Manager is the ultimate responsible of the Company's safety and has the accountability for the SMS implementation.

The Accountable Manager is responsible for:

- setting corporate safety policy;
- setting safety targets and objectives;
- ensuring that managers are committed to safe operations;
- providing sufficient resources for safe operations;
- providing sufficient independent Compliance Monitoring and safety resources;
- enabling and maintaining a 'just culture' throughout the organization;
- effective Compliance Monitoring and safety liaison with other associated companies.

4.3 Safety Manager

The Safety Manager reports directly to the Accountable Manager and is responsible for, and is the focal point for, the development, administration and maintenance of the SMS.

The safety manager is the responsible individual and focal point for the development and maintenance of an effective SMS. The safety manager also advises the Accountable Executive and line managers on matters regarding safety management and is responsible for coordinating and communicating safety issues within the organization, as well as with external agencies, contractors and stakeholders as appropriate.

The Safety Manager is responsible for ensuring that safety documentation accurately reflects the current situation, monitoring the effectiveness of corrective actions, providing periodic reports in safety performance and providing independent advice to the top management, senior management and other personnel on safety-related matters.

In order to avoid the rise of potential conflict of interest, he doesn't hold line management responsibilities and therefore safety management is a responsibility shared by line managers and supported by a staff specialist: the Safety Manager.

The Safety Manager carries out the following functions:

a) Manage the SMS implementation plan on behalf of the Accountable Manager;
b) Facilitate the risk management process that should include hazard identification, risk assessment and risk mitigation;
c) Monitor corrective actions to ensure their accomplishment;
d) Provide periodic reports on safety performance;
e) Maintain safety documentation;
f) Ensure that there is safety management training available and that it meets acceptable standards;
g) Provide independent advice on safety matters;
h) Oversee hazard identification systems;
i) Involvement in occurrence / accident investigations;
j) To collate, understand and disseminate information from other similar organisations, the regulator and contracted organisations.

4.4 Safety Review Board

The Safety Review Board (SRB) provides the platform to achieve the objectives of resource allocation and neutral assessment of the effectiveness and efficiency of the mitigation strategies.
The SRB is a very high-level committee composed by:

- Accountable Manager (president)
- Safety Manager (Secretary)

- Flight Operations Post Holder
- Ground Operations Post Holder
- CAMO Post Holder
- Maintenance Manager
- Compliance Monitoring Manager

The Safety Review Board meets regularly every 6 months. Supplementary meetings can be organized if deemed necessary.

The SRB ensures that appropriate resources are allocated to achieve the established safety performance and gives strategic direction to the safety action group.
The Safety Review Board is responsible for:

- monitoring the effectiveness of the SMS implementation plan;
- monitoring that any necessary corrective action is taken in a timely manner;
- monitoring safety performance against the organization's safety policy and objectives;
- monitoring the effectiveness of the organization's safety management processes which support the declared corporate priority of safety management as another core business process;
- monitoring the effectiveness of the safety supervision of subcontracted operations;
- ensuring that appropriate resources are allocated to achieve safety performance beyond that required by regulatory compliance; and
- giving strategic direction to the SAG.

4.5 Safety Action Group

SAG is a high-level committee, composed of line managers and representatives of front-line personnel, and chaired in turn by designated line managers. The safety manager is the secretary of the SAG. The SAG is eminently tactical and deals with implementation issues to satisfy the strategic directives of the SRB. While the SAG deals with "grass roots" implementation issues pertaining to specific activities to ensure control of the safety risks of the consequences of hazards during line operations, the SRB deals with the coordination of those issues, to ensure consistency with the strategic direction provided by the SRB.
The Safety Action Group (SAG) reports to and takes strategic direction from the SRB. It is comprised of managers, supervisors and staff from operational areas. Membership of the Group and frequency of meetings should be defined.
The SAG:

- oversees operational safety performance within the functional areas and ensures that hazard identification and safety risk management are carried out as appropriate, with staff involvement as necessary to build up safety awareness;
- coordinates the resolution of mitigation strategies for the identified consequences of hazards and ensures that satisfactory arrangements exist for safety data capture and employee feedback;
- assesses the impact of operational changes on safety;
- coordinates the implementation of corrective action plans and convenes meetings or briefings as necessary to ensure that ample opportunities are available for all employees to participate fully in management for safety;
- ensures that corrective action is taken in a timely manner;
- reviews the effectiveness of previous safety recommendations; and
- oversees safety promotion and ensures that appropriate safety, emergency and technical training of personnel is carried out that meets or exceeds minimum regulatory requirements.

Because of the limited complexity of the Xyz Company, there are no permanent designated Safety Action Group(s). Dedicated SAG will be implemented by the Safety Manager whenever the necessity arises (study group, risk assessment group, investigation, emergency situations, etc.).
When a dedicated SAG is not implemented, normal SAG tasks are carried out by the Safety Review Board.

4.6 Management

Senior Management (Post Holders and Head of departments) are committed to:

- Develop the safety policy, which is endorsed and actively supported by the Accountable Manager.
- Assure that all the department procedures undergo an adequate risk assessment before being applied.
- Request advice to the Safety Manager in assessing the risks inside their own department.
- Continuously promote the safety policy to all staff and demonstrate their commitment to it.
- Specify and allocate necessary human and financial resources.
- Establish measurable safety objectives and performance standards for the SMS.
- Make safety their number one priority.
- Show their commitment to safety through their behaviour.
- Verify the application of the safety follow up.
- Verify the effectiveness of the correcting actions or barriers.
- Promote the commitment of the personnel to the safety.
- Assure adequate safety training and divulgation of safety.
- Assure the knowledge of the Emergency Response Plan.

4.7 Personnel

All Xyz employees are accountable for:

- Ensuring they intervene to prevent unsafe conditions from developing.
- Reporting potential hazards.
- Reporting incidents, accidents and near misses.
- Being aware of human factors and human factor limitations.
- Familiarising themselves with the Safety Management System.
- Familiarising themselves with the information available in respect of hazards, equipment, procedures and relevant processes related to their tasks.
- Identifying Compliance Monitoring and safety improvements.
- Cooperating with audits and investigations.

4.8 Organization Chart of management personnel

The organization chart is reported on the Operation Manual part A (or other Company manuals).

5 SMS DOCUMENTATION

5.1 General

In order to explain the SMS organisation and in order to be compliant to the national and international regulations, the Xyz safety organisation is based on the following documentation:

a) SMS Manual
b) Emergency Response Plan
c) References to applicable regulations
d) Internal Safety Reports
e) Safety Cases
f) Safety lists (Hazards, Controls, Unwanted Events, Outcomes, Mitigations, etc.)
g) (...)

The documentation is kept updated by the Safety Manager with the Compliance Monitoring Manager supervision.

5.2 Safety manuals revision

The following is the procedure for the SMS Manual and the Emergency Response Plan revision.

STAGE	REMARKS	TOOLS	MANAGER
Initial change	- Identify the need for change in the SMS Manual/ERP - Submit the requested changes to the Safety Manager	...	Employees or Management
Check the needs	...	...	QMS/SMS Manager
Manual revision	...	...	SMS Manager
Check	- Compatibility with standards - Harmonisation with other documents - Feasibility and relevance - Risk assessment - Track changes	...	Management
Document distribution	- Add the date of update - Distribute the new version - Ensure withdrawal if necessary - Inform employees	Distribution list	...
Update	...	...	...

5.3 Regulatory references

The Safety Manager will regularly check the regulatory documents for updates. Once a new or a revised regulation has been issued, proper changes must be inserted in the internal documentation if deemed necessary.
Changes to the SMS Manual or the Emergency Response Plan will comply with chapter 5.2.

The following is a list of regulatory documents which have to be regularly checked for updates.

DOCUMENT	PERSON ACCOUNTABLE*	TRACEABILITY OF THE AMENDMENT
EU-OPS 1 / JAR-OPS 3		
JAR-FSTD		
JAR-FCL		
EASA Part M		
Local Law		
Airworthiness directives		
Service bulletins		
Contracts (customers and subcontractors)		

* Each person accountable ensures that:

- Modifications of these documents are communicated to all the relevant people
- The necessary changes to the in-house documents are based on modifications of the outside documents
- The invalid and/or overdue versions are clearly identified as such
- The documents are archived in order to ensure necessary traceability - if applicable.

5.4 Safety working documents

Xyz SMS Programme uses the following working documents. Each document will be properly updated when needed in order to assure the effectiveness of the safety programme.

Document	Person accountable	Storage location	Backup period
Safety Report			For life
Safety Case			5 years
Hazards list			5 years
Controls list			5 years
Unwanted Events list			5 years
Outcomes list			5 years
Mitigations list			5 years
Safety Objectives			5 years
Initial Notification			5 years
Safety Alert Notice			5 years
Safety magazine			5 years
Safety Audit			5 years
Safety training course			5 years
Management of change			5 years

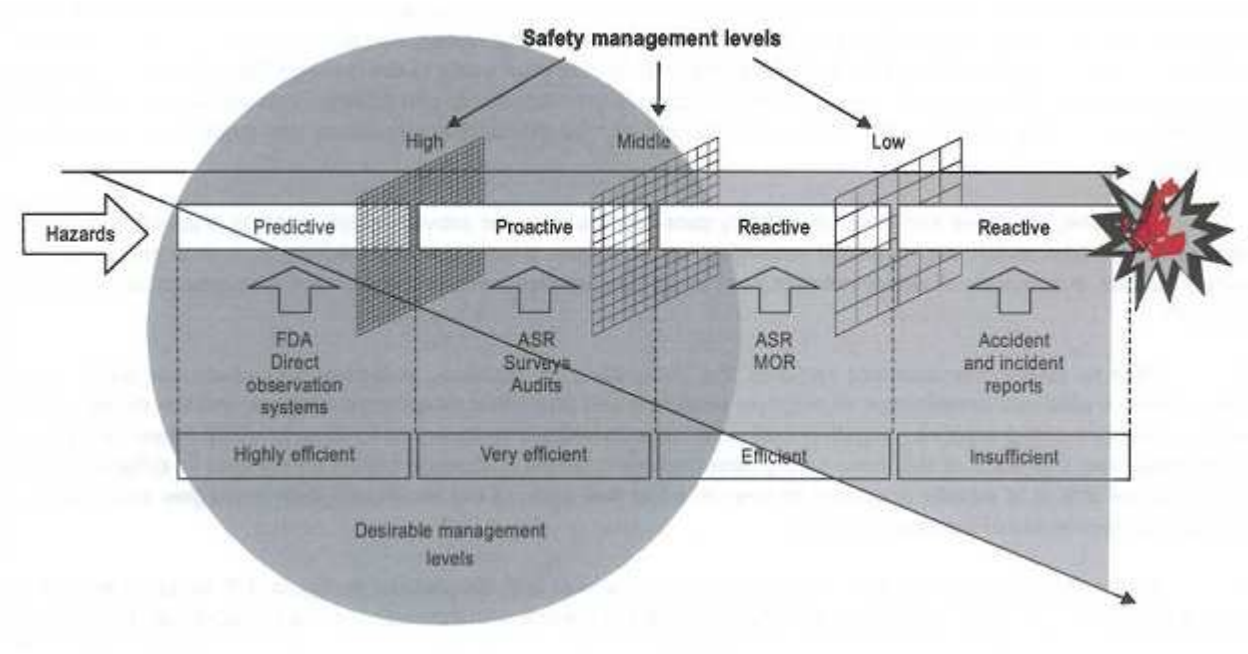
6 SAFETY MANAGEMENT

6.1 General

The safety management is the core element of the SMS. There are three levels of safety management:

- The reactive mode is based on the analysis of events that have already occurred. The safety findings of these events are used to opportunely change the company activities and procedures.
- The proactive mode strives to identify possible dangers by analysing the ongoing activities and their outcomes, the changes within the company or the beginning of new activities.
- The predictive mode enables the identification of deviations from standardized activities by studying the two former modes and by looking for signs of "weakness" in the daily operations. In this way safety actions can be sought before safety is impaired.

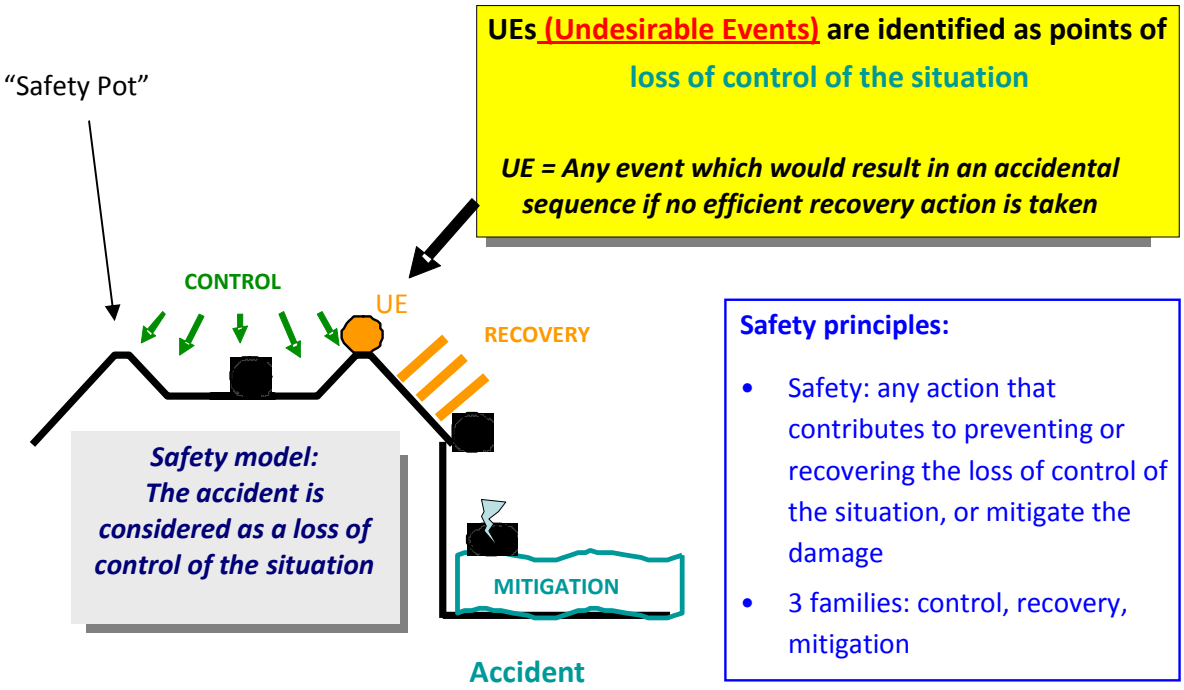
This strategy is shown in the following diagram:



Safety management levels

The aim of the safety management is to set up the necessary measures to identify the conditions which are precursors to undesirable events. Avoiding or limiting these conditions and operating in a "control zone" will decrease the possibility of the occurrence of an accident/serious incident or it will limit its negative consequences.

This is indicated in the "safety model":



Source: Air France Consulting/Quality Audit

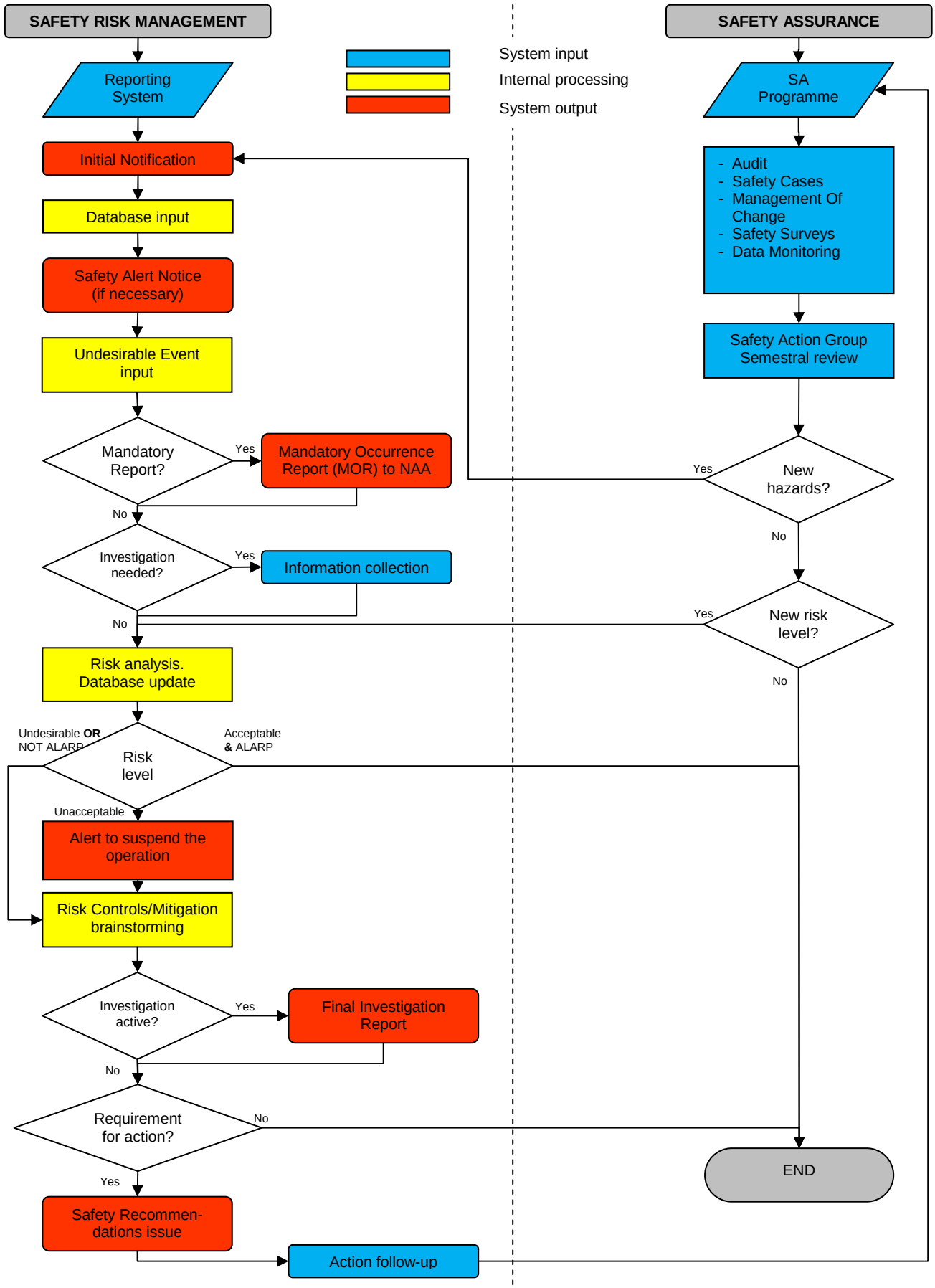
Once dangers have been detected, either through an event/incident/accident report or by a safety evaluation, the risk management process begins.
The management of risk consists on the evaluation of possible injuries or losses caused by a danger and the consequent adoption of controls in order to maintain an acceptable level of operational safety – i.e. remain inside the boundaries of the "safety pot".
External or internal situations or deficiencies (meteorological, technical, errors, deviation from standards, violations, etc.) will let the situation migrate to the boundaries of the "safety pot" and eventually cross it. If this happens, valid recovery measures (emergency procedures, safety technology, alert systems) must be in place in order to return inside the "safety pot" or the situation could spoil into an incident or an accident. In case all the safety barriers fail, the operator must face an unwanted incident/accident. In this case valid mitigation measures (Emergency Response Plan, survival equipment, Emergency Locator Transmitters, etc.) must be deployed in order to limit the negative consequences and allow a quick return the normal situation ("safety pot").
The Safety Management plan strives to find out valid control, recovery and mitigation measures in order to maintain or push back the situation inside the "safety pot" (reactive). The study of a valid measure could be initiated by a safety event (reactive) or by evaluating the reporting system to find out safety deficiencies before they will show themselves up (proactive), or by actively finding out safety elements and indications (audit, data monitoring, safety surveys, etc.) that will predict a safety deficiency in the organisation (predictive).

Xyz adopts the following strategy to manage the company's safety.

- Safety Concern Identification – through the safety reporting system or the safety assurance output (Audits, Safety Cases, Management of change, Safety Surveys, Data Monitoring)
- Database input

- Hazard Identification – the defined safety concerns are split in hazards, also called contributing factors
- Risk analysis and assessment for each hazard in the database
- Controls and Mitigations Identification in order to reduce the risk to an acceptable level
- Safety Action Group – is delegated to actively evaluate and assess the risks and the subsequent safety actions
- Safety Recommendations – are issued by the Safety Department
- Safety Assurance Program – will supervise the application and the efficiency of the safety recommendations
- Safety Assurance Program – will adopt proactive and predictive programs in order to spot deficiencies (audits, Safety Cases, safety surveys, etc.)

The Xyz safety management flowchart is depicted below:



Safety Management procedure flowchart

The Safety Management is composed of two main activities:

- Safety Risk Management; and
- Safety Assurance

The Safety Risk Management deals with the reporting system, the identification of hazards, their analysis and assessment, and the issuance of controls and mitigation.
The Safety Assurance focuses on verifying the effectiveness of the proposed changes (suggested by the risk management process) and on the analysis of safety studies.

6.2 Hazards & Risks

An organisation is confronted with many sources of hazards, these hazards can be divided in:

- Natural, environmental (storms, cyclones, earthquakes…)
- Technological (explosion, chemical pollution, defective tools…)
- Economical (Financial crisis)
- Physiological (viruses)
- Unsafe acts (human error, violations, Procedural Intentional Non Compliance (PINC), sabotage, terrorism…)

The nature of hazards and the consequences of hazards must not be confused.
For example, a cumulous cloud is dangerous for aircraft in flight only if the aircraft is near it (less than 5 nautical miles). The possible consequences of such a hazards (if the aircraft is subjected to this hazards) are:

- Strong turbulence can cause total destruction of the aircraft.
- A bolt of lightning could cause electrical damage and human injury
- A hailstorm could damage the structure and the shape of the blades
- Heavy rain could cause engine flame out
- Frost and ice accretion could increase aircraft payload, deform the aerodynamics of the blades and interfere with the switch plate.

Hazard is defined as a condition or an object with the potential to cause injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function. Hazards are normal conditions and they are part of the working environment, but they could spoil in a dangerous event. For example: trees are part of a normal environment. During swing load operations trees generally do not make the normal activity to spoil into an accident. Nevertheless they have the potential to cause harm. In fact they can be struck by the tail or main rotor, their branches could break and fall due to rotor downwash, they could deviate the direction of the wind making the manoeuvre more difficult, and so on. Some triggering events could initiate a negative occurrence – i.e. a consequence of the hazard (pilot error, wind change, sun glare, etc.).

Safety risk is defined as the assessment, expressed in terms of predicted probability and severity, of the consequences of a hazard, taking as reference the worst foreseeable situation.
The risk is the measurement of the gravity which a hazard could spoil into a negative event or, in other words, is the possibility of harm in terms of likelihood and the severity of the consequences of a hazard.
The presence of trees during a swing load operation is a HAZARD. The pilot is used to work in an environment with trees below and around the helicopter. The trees (hazard) do not constitute a negative event: nothing happened so far.

On the other hand the presence of the trees (Hazard) could make the pilot to hit them with the tail rotor in particular circumstances (gusting winds, unstabilized load, etc.). The probability that this will happen and the severity of the consequences is the RISK LEVEL.

6.3 Safety Risk Management

Safety Risk Management encompasses the following activities:

- Reporting System
- Hazard Identification
- Database procedures
- Risk Analysis
- Risk Assessment
- Controls/Mitigation definition
- Safety Action Group (SAG) meetings
- Safety Recommendations

The first step of the risk management process is to find out the safety concerns – i.e. all those situations, occurrences, environments, major changes, negative trends or possible negative outcomes that could endanger the safety of flight. These concerns are divided in “Safety Events” and “Safety Studies”.

Safety Events – are those occurrences reported by the personnel or identified by the Safety Manager that have endangered or could have endangered the safety of flight. These are events that have already happened and that the Safety Manager must “reactively” analyse and he must find out what has gone wrong and what are the missing barriers.
The events are recorded into the “Safety Database.xls” file (see Appendix G).

Safety Studies – are situations, operations or changes that have not happened or that have not degraded into a dangerous situation (event) yet, but that have the potential of harming people or properties in the future. These are dangers that the Safety Manager must “proactively” or “predictively” foresee and which proper barriers must be put in place in order to reduce the probability that they will harm the safety of flight.
Normal safety studies include:

- Audits
- Safety Cases
- Management of Change (MOC)
- Safety Surveys
- Data Monitoring programs

Safety Studies are recorded into the form in Appendix F

6.4 Reporting System

The Occurrence Reporting Systems is an essential element in hazard identification. Nobody knows actual system performance better than operational personnel. An organization that wishes to know how it really operates daily, as opposed as to how it should operate as per "the book", should ask operational personnel, hence the importance of the reporting systems.
Pilots and technicians will report occurrences or safety concerns by filling out the safety report form (Appendix A).

The form can be printed and manually filled out, or it can be completed electronically and then sent by e-mail.

There are three types of reports:

a) mandatory reports;
b) voluntary reports; and
c) confidential reports.

With ***mandatory reports,*** people are required to report certain types of events or hazards (Directive 2003/42/EC). The report shall be filled out by the Pilot in Command or by the technician every time the event matches the list in Appendix B. The report shall be sent to the reference Post Holder right after an occurrence has happened or right after a flight or series of flights in which the occurrence happened. The pilot in command or the technician shall advise the reference post holder by telephone as soon as possible. The company must forward the report to the Authority within 72 hours from the event.

With ***voluntary reports*** the reporter, without any legal or administrative requirement to do so, submits voluntary event or hazard information. The form will be sent to the reference Post Holder or directly to the Safety Manager. When a Post Holder receives a safety report he/she will forward a copy to the Safety Manager as soon as possible.
The reported information will not be used against the reporters and the information collected will not be used for punishment or blame.

Confidential reports aim to protect the identity of the reporter. This is one way of ensuring that voluntary reporting systems are non-punitive. Confidentiality is achieved by de-identification, and any identifying information about the reporter is known only to the Safety Manager in order to allow for follow-up or "fill in voids" in the reported event(s). Confidential incident reporting systems facilitate the disclosure of hazards leading to human error, without fear of retribution or embarrassment, and enable broader acquisition of information on hazards.
The confidential report can be sent directly to the Safety Manager. The Safety Manager will retain all the information that could lead to the originator of the report or to the persons involved before sharing the occurrence within the Safety Action Group.

Anonymous reports
Anonymous reports (i.e. those with unknown originator) will generally be accepted but a sound judgment will be applied in order to understand if this kind of report is safety related or can have other hidden purposes (personal revenge, employee demotivation, etc.) and has not to be taken into consideration.
Anonymous reports cannot be questioned back, so it could lack of important related safety information.

When a printed form is received, the Safety Manager will detach the first part of the report (originator data) and send it back to the sender in order to confirm the reception of the report and to remove any personal reference from the report. Reports received by e-mail or telephone will be acknowledged accordingly.
All safety reports, anyway, will be depersonalized. No references to the reporting person, involved persons, place or time will be made during the treatment of the occurrence nor they will be divulgated outside the Safety Action Team.

The Safety Manager will make an entry in the safety database with all the relevant information. The name of the originator or the people involved can be inserted or retained for privacy reasons. If names are inserted, the whole database will be treated as confidential by the Safety Manager and a copy will eventually be divulgated to the Safety Action Group only after all of these references have been removed.

6.5 Hazard Identification

Once new dangerous situations have been identified by the reporting system or by the Safety Assurance program, the second step is to split each situation in Hazards – i.e. all those basic situations, or contributing factors, that concur to the occurrence of the undesired event.
In a "swing load operation" Safety Case study (Safety Assurance), for example, several hazards could be found out:

- Strong or gusting winds
- Pilot experience
- Pilot fatigue
- Operations during dusk or dawn
- (...)

As said before the hazards are those potentially dangerous situations (also called contributing factors) which could contribute to the occurrence of an event.

A brainstorm method must be used to spot all the hazards that could endanger the operation.
Sources of hazards could be internal or external to the company.

There are two main sources of safety concerns which will be used to identify the related hazards: internal sources and external sources.

Internal sources:

- **Company mandatory, voluntary and confidential reporting system**
  Pilots and technicians report occurrences or safety concerns by filling the safety report form (Appendix A).
- **Safety Cases**
  The Safety Case study is a brainstorm activity used to identify the risks connected with a particular operation or situation (e.g. HEMS, hoist, sling load, offshore). The study can be developed using defined methods (e.g. fault tree analysis, bow tie model) or through simple brainstorming activity.
- **Management of change**
  Important changes in the company organization (e.g. new operative base, new helicopter type) must be analyzed in order to identify the hazards related to the incoming new organizational situation.
- **Audits and surveys**
  Audits and surveys can reveal hazards which will be recorded into the database.
- **Data Monitoring**
  Helicopters are equipped with computerised data recorders which information can be downloaded, stored and analysed. Proper track of these data can reveal a tendency of negative behaviours (mechanical or human) or they can show imminent technical problems.
  Opportunely analysed data can be of great support in spotting technical and human factor hazards.

The Safety Manager will monitor all these sources and initiate a proper hazard evaluation when necessary.

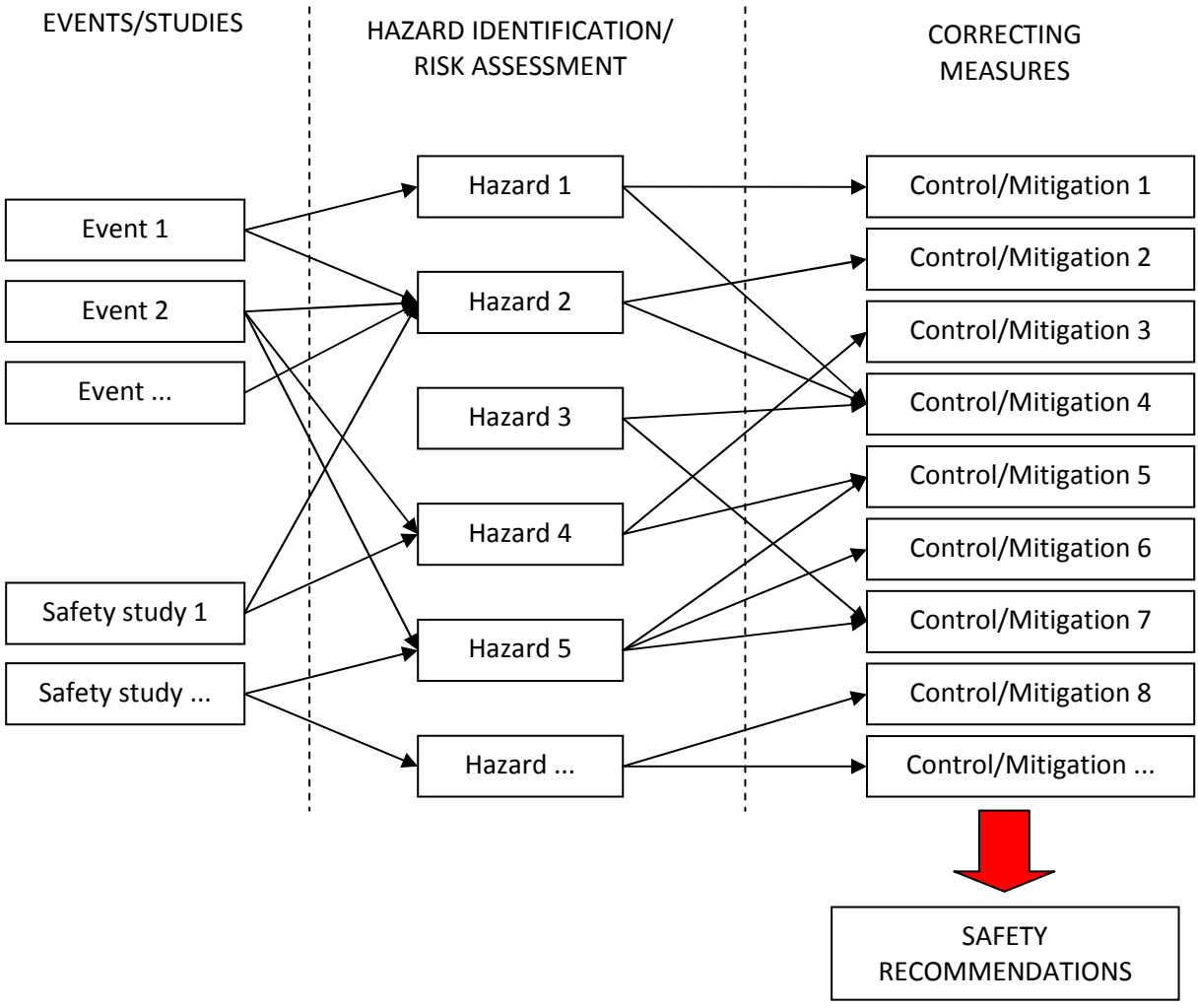
External sources
This information could be sought by sharing experiences with other aeronautical companies, by the consultation of different internet sites of national and international organizations, by the study of accident reports from different investigation agencies, or by the analysis made and the information taken from specialized publications.
Among the most important sources of hazard identification there are:

- **Aeronautical accident reports**

Continuous review of external accidents and incidents information could lead to reveal similar internal weakness to be analysed.

- **State safety programme**
  Information from the authority could start an internal hazard investigation or study (e.g. volcanic ash Safety Case study).

Every safety occurrence (Event) and Safety Study from the Safety Assurance Program could identify one or more hazards.
Hazards are potential dangerous situation. They need to be controlled by some Controls, that prevent the incident to occur, or by some Mitigations, that reduce the consequences once the incident has already happened. Every hazard can have one or more controls/mitigations.
The adoption of the controls/mitigations will eventually lower the corresponding risk level. Some controls/mitigations are generally already in place, while others are spotted and suggested. These one will be addressed to the related Post Holder through the Safety Recommendations
The following figure depicts the relations between the occurrences, the hazards, the controls/mitigations and the safety recommendations:



Relationship between Events/Safety Studies, Hazards and Controls/Mitigations

6.6 Initial Notification

After the Safety Manager receives a Safety Report or when a Safety Assurance study shows up a safety concern, the proper procedure will be initiated. It could take quite a time between the disclosure of that safety concern and the Safety Action Group (SAG) meets in order to discuss and properly assess the hazards and the risk level. In order to advise the involved post holder that a safety concern is under analysis, the Safety Manager will issue an Initial Notification to the involved Post Holders or to the entire SAG.
The Initial Notification form is reported in appendix C.

6.7 Safety Alert Notice

When the Safety Manager deems necessary, the company's personnel will be advised of an ongoing safety problem by issuing a Safety Alert Notice (Appendix D).
The purpose of the Safety Alert Notice is to promptly inform pilots and technicians that a safety concern is under analysis and, before an adequate action can be taken, people must be aware of the existing unmanaged risks.

6.8 Safety Analysis

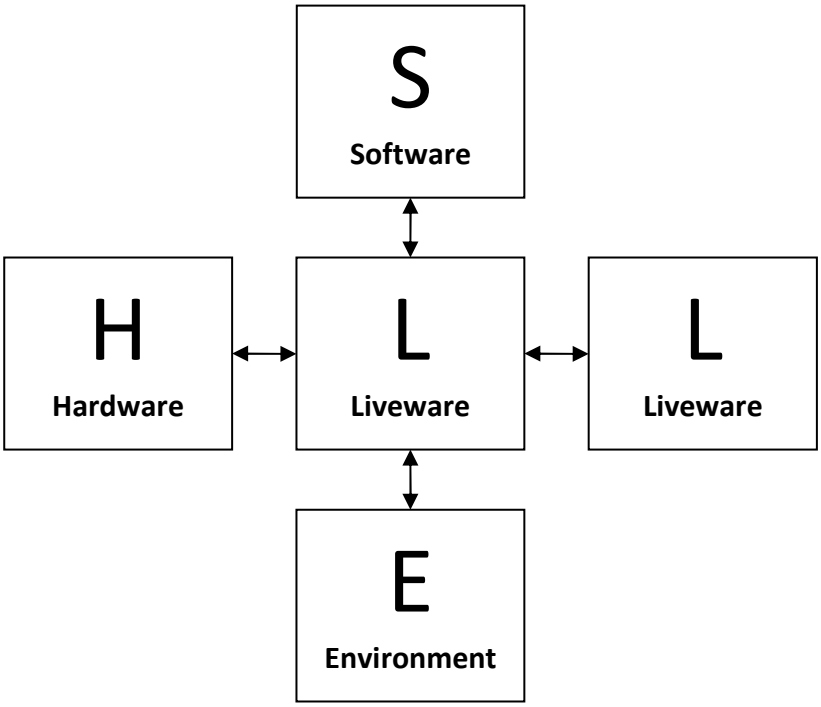
Every dangerous situation is different from each other and it is not possible to create dedicated procedures to handle all the situations. Safety analysis is bases mostly on comparison and brainstorming activity.

The Safety Manager must collect as much related information as possible. Then he/she must compare the situation with the real world databases or known incidents/accidents. It is difficult to have a comprehensive collection of aeronautical incidents/accidents, that's why the Safety Manager must actively collect them during his/her safety career in order to compare the company's events or safety concerns with the outside aeronautical world. Comparison will allow a better understanding about the likelihood of the related incident class, not only comparing that with internal events but especially with other known situations.
The comparison will also permit a better understanding and a more complete brainstorming in relation to the safety concern.

Several analysis methods are available. One of the most used ones is the SHELL model. This method requests specific analysis in the interaction between five basic areas:

- Liveware (in the centre of the diagram) – This is the personnel involved in the occurrence or the focal personnel of the safety concern (pilot, technician, ramp agents, etc.)
- Software – This relates to all the procedures, manuals, regulation, laws, practice, habits related with the operation involved
- Hardware – This relates to the aircrafts, systems, electronics, components, etc.
- Environment – This relates to the weather, surroundings, land or water typology, etc.
- Liveware (the one on the right side) – is all the personnel that will interact with the pilot, technician, or the main personnel involved.

The SHELL model is reported in the following figure.



The SHELL model (Liveware-Software-Hardware-Environment-Liveware interaction)

Another method of analysis is the "What If" model.
This brainstorming method uses the question "what if" applied repeatedly on the studied event or situation. For example: on a landing gear aural and light warning triggering, due to a retracted landing gear at low altitude during an approach, these could be the "what if" questions:

- What if the aural warning did not deploy? (will the light warning be seen in a bright light condition?)
- What if the final checklist were not be executed? (was it executed?)
- What if the pilot did not execute a missed approach? (IFR conditions? There was enough time to lower the landing gear before the landing?)
- What if the pilot was overloaded with an emergency situation? (Could his attention be attracted by the warnings?)
- …

The Safety Analysis will be initially made by the Safety Manager. The results of the initial analysis will be inserted in the Initial Notification and sent to the Safety Action Group (SAG).
Subsequently, when the SAG meets, the safety concern will be discussed within the group and a final analysis will be adopted.

Analysis and related risks decided during the SAG meetings will be transcribed on the minute of the meeting, and the database will be changed accordingly.

6.9 Risk Assessment

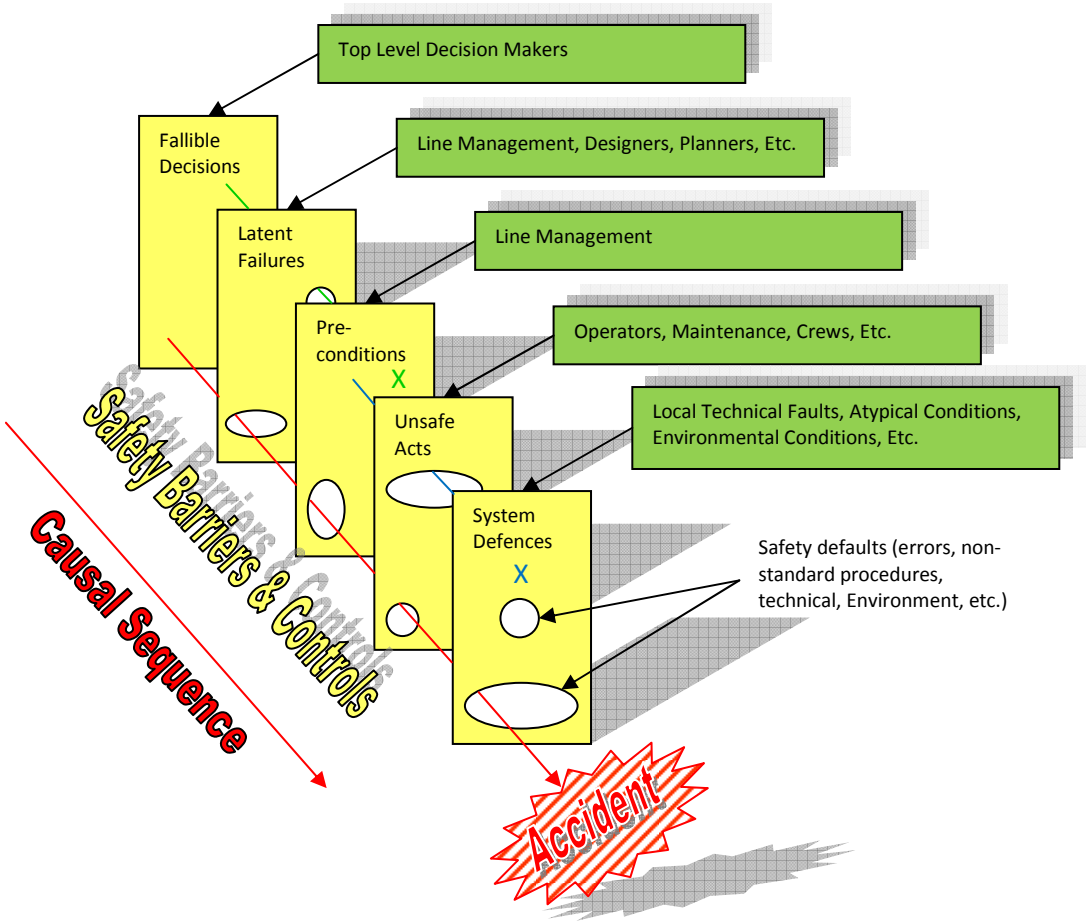
Once hazards have been identified and the safety concerns have been analysed, the safety risks of their potential consequences must be assessed. Safety risk assessment is the analysis of the safety risks of the

consequences of the hazards that have been determined as threatening the capabilities of the organization.

The action of the Safety Manager and of the Safety Action Group consists of exploiting the events and the safety studies by systematically analyse them and update the data base in order to correct variance and maintain an acceptable level of safety.

Experience proves that an incident/accident has never arisen from one single cause but that it has occurred through the failure or inadequacy of several safety barriers at several levels of the organisation.

This state of events is depicted in the James Reason's flow chart below:



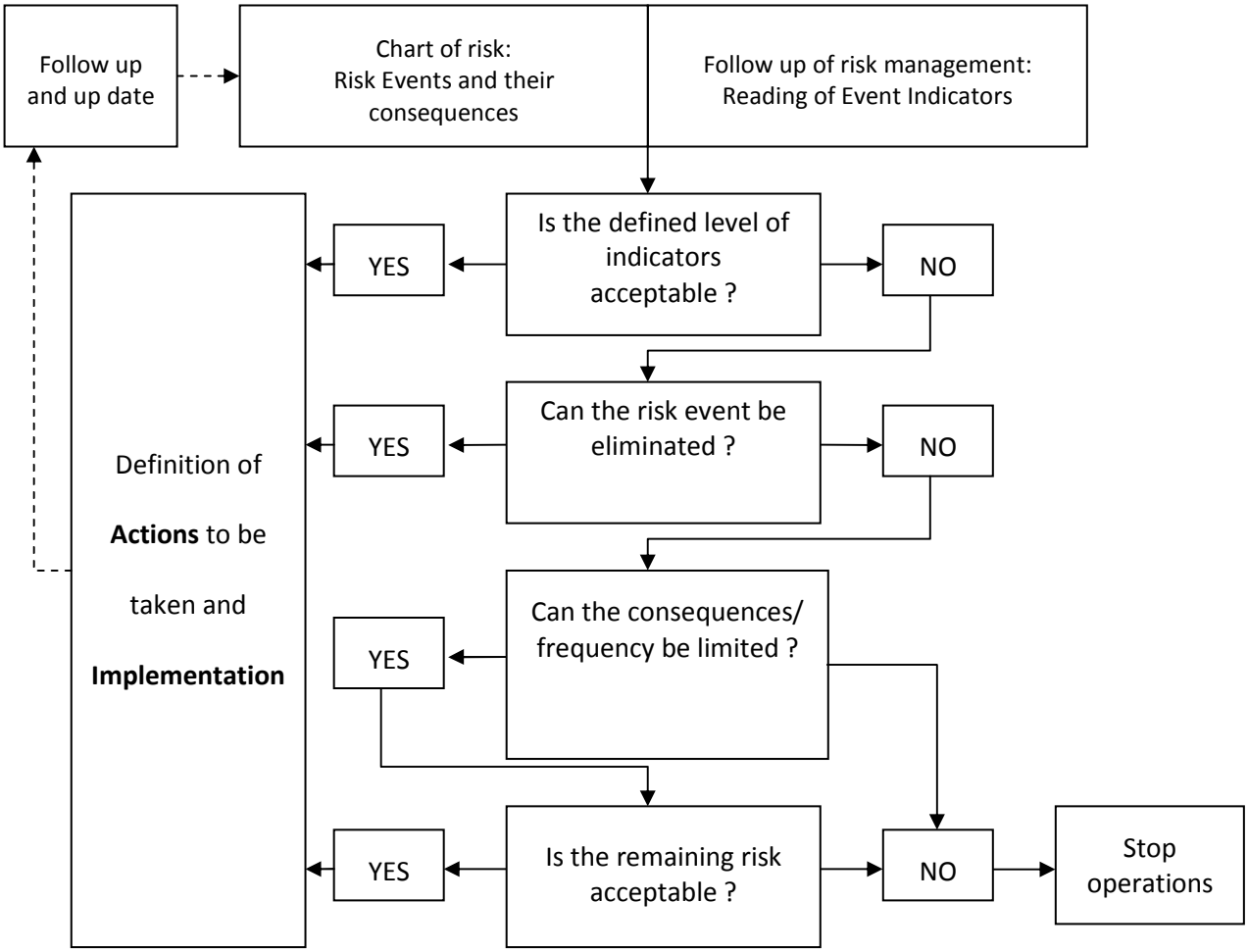
Organisational failure (Source : adapted from James Reason model)

It is necessary to evaluate the level of efficiency of the controls/barriers. Safety risk assessment use a conventional breakdown of risk into two components: the probability of occurrence of a damaging event or condition, and the severity of the event or condition, should it occur. Safety risk decision making and acceptance is specified through use of the risk tolerability matrix (Appendix E).

(The matrix reported in "Appendix E" comes from the ICAO Doc 9859 - Safety Management Manual (SMM) and has been just slightly changed.
A more comprehensive example is reported in "Appendix E bis".

Is up to the operator to elect one of these references or prepare his own matrix)

Each risk is examined through the following process:



Risk Assessment process

The risk assessment will be recorded inside the "Undesirable Event List.xls" or the "Safety Studies.xls" files with the corresponding controls and mitigations. The file "Hazard List.xls" contains the list of all the available analyzed hazards (see Appendix G).

It is imperative that a costs/profits analysis of the corrective actions be agreed with the SRB and the CEO. Generally there could be several measures to reduce the risk to a lower level, but some of those could not be feasible for unavailability of economic, manpower, organisation, environmental, etc. resources.
The following diagram could assist in the decision.

		BENEFITS		
		High	Medium	Low
COSTS	Low	1	2	3
	Medium	2	3	4
	High	3	4	5

Cost-Benefit Matrix

6.10 Controls & Mitigations

After safety risks have been assessed though the preceding step, elimination and/or mitigation to ALARP (As Low As Reasonably Possible) must take place. This is known as safety risk control/mitigation. Safety risk controls must be designed and implemented. These may be additional or changed procedures, new supervisory controls, changes to training, additional or modified equipment, or any of a number of other elimination/mitigation alternatives. Almost invariably these alternatives will involve deployment or re-deployment of any of the three traditional aviation defences (technology, training and regulations), or combinations of them.

BARRIERS, or CONTROLS, are those procedures, rules, laws, technologies or operative conditions that are put in place in order to decrease the possibility that the undesirable event will happen, or to make the severity of the consequences as low as possible.

For example, a proper training to pilots about the flight in reduced visibility will reduce the possibility of a inadvertent IMC situation (undesirable event control/barrier).
An advanced IFR training will reduce the consequences (e.g. loss of control) following an inadvertent IMC situation (undesirable event recovery).
The installation of a EGPWS (Enhanced Ground Proximity Warning System) will technologically reduce the consequences of an inadvertent IMC advising the pilot of a possible impact with the terrain (undesirable event recovery).

Safety Risk Controls will be proposed and discussed into the Safety Action Group during the periodic meetings. After the controls have been discussed and approved, the related Safety Recommendation will be issued by the Safety Department.
The Safety Department can issue the safety recommendations in advance, before the next Safety Action Group meeting. In this case the hazards, the related controls and the safety recommendations must be discussed and approved by the Safety Action Group during the next meeting.
At this point, the system is ready for operational deployment/re-deployment, assuming that the safety risk controls are deemed to be acceptable.

The assessment of hazards should take into consideration all possibilities, from the least to the most likely. It has to make adequate allowance for "worst-case" conditions, but it is also important that the hazards to be included in the final analysis be "credible" hazards. It is often difficult to define the boundary between

the worst credible case and one so dependent on coincidence that it should not be taken into account. The following definitions can be used as a guide in making such decisions:

a) ***Worst case.*** The most unfavourable conditions expected, e.g. extremely high levels of traffic and extreme weather disruption.
b) ***Credible case.*** This implies that it is not unreasonable to expect that the assumed combination of extreme conditions will occur within the operational life cycle of the system.

A risk is considered ALARP (As Low As Reasonable Possible) when further solutions to reduce the risk level will be considered not feasible (technologically, financially, operatively) and when the remaining risk level has been considered known and acceptable.

Some solutions are much easier and economic to introduce than others.
The Safety Manager must help the management in identifying as many solutions as possible.
The related Post Holders are responsible to implement valid solutions in order to effectively reduce the risk level.
The CEO is responsible of the overall safety of the company.

6.11 Safety Review Board

The Safety Review Board (SRB) is the core element of the Safety Management.
The SRB evaluates the company's risk levels, approves the high level controls and mitigations and decides if the high level risks are considered ALARP. The Safety Department "manages" the company's safety, while the SRB takes the decisions. Finally it is up to the Post Holders to maintain the safety in their respective departments and to accept and apply the suggestions from the SRB in order to reduce the risk level.

The SRB will meet every six months to discuss, evaluate, assess and to find the correct controls and mitigations to the high level safety concerns discovered in the previous period.
The SAG is composed by the CEO, the whole management and the Safety Manager. The CEO is the president. The Safety Manager is the secretariat.
The Safety Manager will divulgate the agenda to the SAG at least 15 days before the meeting. He will manage the meeting and will propose the safety concerns to the group. The Safety Manager will prepare the minute of the meeting and he will submit it to the group for approval.

6.12 Safety Action Group

The Safety Action Group (SAG) reports to and takes strategic direction from the SRB. The SAG is composed by the front line managers and can be implemented by the Safety Manager whenever the necessity arises.
If deemed necessary permanent SAG can be created for specific areas (Operations SAG, Technical SAG, etc.).

6.13 Safety Recommendations

If new controls or mitigation have been discovered, a proper safety recommendation must be eventually issued to the appropriate Post Holder. The safety recommendation must be approved by the SAG and must be saved into the database. If possible a timeline must be issued with the recommendation. The Safety Manager will periodically review all the open safety recommendations to verify if they have been applied and if the related risks have been reduced.

Safety recommendation situation will be brought to the SAG meeting and non-efficient recommendations will be discussed and changed accordingly.

7. SAFETY ASSURANCE

7.1 General

Safety risk management requires feedback on safety performance to complete the safety management cycle. Through monitoring and feedback, SMS performance can be evaluated and any necessary changes to the system effected. In addition, safety assurance provides stakeholders an indication of the level of safety performance of the system.

Assurance can simply be defined as "something that gives confidence". The safety risk management process in the SMS starts with the organization obtaining a good understanding of its operational processes and the environments in which it operates; progresses through hazard identification, safety risk assessment and safety risk mitigation, and culminates in development and implementation of appropriate safety risk controls. Once controls for the safety risks of the consequences of hazards are designed, deemed to be capable of controlling safety risks, and put into operation, safety assurance takes over safety risk management.

Once safety risk controls are developed and implemented, it is the organization's responsibility to assure that they continue to be in place and that they work as intended. Under the above definition of "assurance", this consists of processes and activities undertaken by the organization to provide confidence as to the performance and effectiveness of the controls. The organization must continually monitor its operations and the environment to assure that it recognizes changes in the operational environment that could signal the emergence of new and unmitigated hazards, and for degradation in operational processes, facilities, equipment conditions, or human performance that could reduce the effectiveness of existing safety risk controls. This would signal the need to return to the safety management process to review and, if necessary, revise existing safety risk controls or develop new ones.

A process of permanent examination, analysis and assessment of these controls must continue throughout the daily operation of the system. The safety assurance process mirrors that of Compliance Monitoring, with requirements regarding analysis, documentation, auditing, and management reviews of the effectiveness of the safety risk controls. The difference is that the emphasis in safety assurance is on the assurance that safety risk controls are in place, being practised, and remain effective. The traditional emphasis in quality is typically on customer satisfaction, which, unless the proper perspectives are respected, may or may not fully parallel safety satisfaction.

Safety assurance is assured through regular meetings of the Safety Action Group (SAG). The SAG will meet periodically and it will:

- Discuss the safety occurrences events which happened since last meeting and define the appropriate risk levels and controlling/mitigating actions.
- Review the open previous controlling/mitigating actions to determine the new risk level. If the risk has been recognized as lowered and ALARP, then the SAG can close the actions. Otherwise the SAG will discuss new mitigating actions or reinforce the ones already issued.

The database will be changed accordingly with the SAG decision.
All decisions taken by the SAG will be transcribed in the meeting minute.

8. PROMOTION - TRAINING - COMMUNICATION

8.1 Safety Promotion

In an organisation, to promote the culture of safety is to make everyone aware that, at their level and in their day-to-day activity, they are responsible for key safety functions and thus they contribute to the effective implementation of the SMS.
Management is the driving force of an effective SMS, thus it is the responsibility of each manager to demonstrate his/hers commitment to the principles of safety.
Management must promote the safety in everyday activities.

8.2 Training of personnel

Each person in charge of each sector must set up the training necessary and adapted to reach the highest standards of safety.

No employee must be assigned a task for which they are not qualified or have not received suitable instruction. This training, valid 2 years (to be defined by the Operator), must include the concepts and principles of the SMS.

Each member of staff must receive regular training to update their qualifications including revision of the safety rules and regulations.

To set up a culture and effective policy of safety is a long-term task which can take years. However, it can take only a few moments to endanger the achievements of this system by unsuitable actions or inappropriate behaviour.

8.3 Communication

The communication must be simple, concise and easily accessible to encourage discussion and to make the most of the lessons drawn from the reported events.

Communication is made in the form of diffused information in reports of incident or accident, subscription to various specialised publications, display in the various buildings of information relating to the security of the flights and by the organisation of regular briefings made to the personnel.

APPENDIXES

- **A.** Safety report form
- **B.** Safety Objectives
- **C.** Initial Notification form
- **D.** Safety Alert Notice
- **E.** Risk matrix
- **F.** Management of Change Form
- **G.** Database

APPENDIX A

Note: This document can be separately saved as a word template and protected for field editing only. The employee will be able to check the boxes and write only in the grey areas and send the document to the Safety Department as a separate document.

SAFETY REPORT

REFERENCE

☐ Mandatory ☐ Voluntary ☐ Confidential

1 ORIGINATOR DATA

To:
☐ Safety Manager ☐ Operation Post Holder ☐ Ground Post Holder
☐ CAMO Post Holder ☐ Maintenance Manger ☐ Compliance Monitoring Manager
☐ Training Post Holder ☐ T.R.T.O.
☐ Other: ______________________________

From: ______________ Position: ______________ Telephone: ______________

Subject: ____

☐ I wish to remain anonymous, but you may contact me if you have any question. Please remove all identification before recording the information.

☐ Please include my name as a part of this report

Date: ______________ Signature: ____________________

2 CREW

Captain ______________ First Officer ______________ Pilot Flying: ☐ CPT ☐ F/O ☐ Other Crew

Other Crew ______________ → Function on Board ______________

Cut here - **Cut here**

3 TYPE OF EVENT

☐ ASR	☐ Airprox/ATC	☐ GPWS	☐ Wake Turbolence	☐ Bird Strike
☐ Volcanic Ash	☐ Windshear	☐ Portable Elec. Devices	☐ Human Factor	☐ Maint.
☐ Ground Obstacles	☐ Helipads	☐ Landing Sites	☐ Technical	☐ Ground Operations
☐ Medical Equipments	☐ Passengers	☐ Meteorological	☐ Iceing	☐ Rotor, T/R
☐ Survival/Emergency Equipment		☐ Other ______________________		

4 FLIGHT DATA

Date of Occurrence ______________ Time of Occurrence (UTC) ______________ T/O Time (UTC) ______________

Route:
from ______________ to ______________ diverted ______________

A/C Type ________ Registration ________ Crew/Pax ____/____ Altitude FL ____/____ ft Speed ________ Flight Rules ☐ VFR ☐ IFR

Squawk ______ T/O Weight ________ T/O Fuel ________ Occurrence Fuel ________ ATL/HTL Ref. ________

Configuration: ☐ HEMS ☐ Off-shore ☐ SAR ☐ TPP

5 FLIGHT PHASE

☐ Planning ☐ Ground handl. ☐ Boarding ☐ Engines Start ☐ Ground Test/Run-up

☐ Hover ☐ Taxiing ☐ Take-Off ☐ Initial Climb ☐ Climb ☐ Cruise

☐ Descent ☐ Holding ☐ Approach ⟹ ☐ Visual ☐ Non Precision ☐ Precision

☐ Final ☐ Landing ☐ Disembarking ☐ Maintenance ☐ Other _____

Airport/Heliport _____ Geografical Position _____

6 LANDING PLACE CONDITIONS

☐ Aerodrome ☐ Helipad ☐ HEMS Landing Site ☐ Elevated Pad ☐ Ship

☐ Off-Shore Platform ☐ Hostile ☐ Congested ☐ Dry ☐ Damp

☐ Wet ☐ Standing Water ☐ Ice ☐ Dry Snow ☐ Wet Snow

☐ Slush ☐ Mud ☐ Slippery

Surface Type _____ Lateral Slope _____ Longitudinal Slope _____

Ship Track/Speed _____ Ship/Platform Height _____ Ship Roll _____deg. Ship Pitch _____deg.

7 WEATHER CONDITION

☐ VMC ☐ IMC ☐ Night ☐ Day

☐ Rain	☐ Hail	☐ Snow	☐ Turbulence	☐ Ice	☐ Windshear
☐ Ligt	☐ Ligt	☐ Ligt	☐ Ligt	☐ Ligt	☐ Ligt
☐ Moderate	☐ Moderate	☐ Moderate	☐ Moderate	☐ Moderate	☐ Moderate
☐ Severe	☐ Severe	☐ Severe	☐ Severe	☐ Severe	☐ Severe

T/O Wind _____ Occurrence Wind _____ Vis./RVR _____ Ceiling _____ Temp _____ QNH _____

Clouds _____ Sea State _____ Sea Direction _____

8 A/C CONFIGURATION

☐ Stabilization State _____ ☐ Autopilot State _____ ☐ Landing Gear State _____ ☐ Anti-ice State _____

9 BIRD STRIKE

Type of bird(s): _____ Size: ☐ Large ☐ Medium ☐ Small

Time: ☐ Dawn ☐ Day ☐ Dusk ☐ Night

Nr. Struck: ☐ 1 ☐ 2-10 ☐ 11-100 ☐ More

Nr. Seen: ☐ 1 ☐ 2-10 ☐ 11-100 ☐ More

Please describe impact point(s) and damage to aircraft:

_____

10	WAKE TURBULENCE

Were you aware of other traffic before the incident: ☐ Yes ☐ No

Turning? ☐ No ☐ Left ☐ Right _____ Deg.

Change in attitude: Pitch _____ Roll _____ Yaw _____ deg. Change in altitude: _____ ft

Pos. on glideslope: ☐ High ☐ Low ☐ On Pos. on ext. centerline: ☐ Left ☐ On ☐ Right

Stick shaker: ☐ Yes ☐ No Buffet: ☐ Yes ☐ No

Please describe details of preceding aircraft and any additional information:

_____

11	DESCRIPTION OF OCCURRENCE

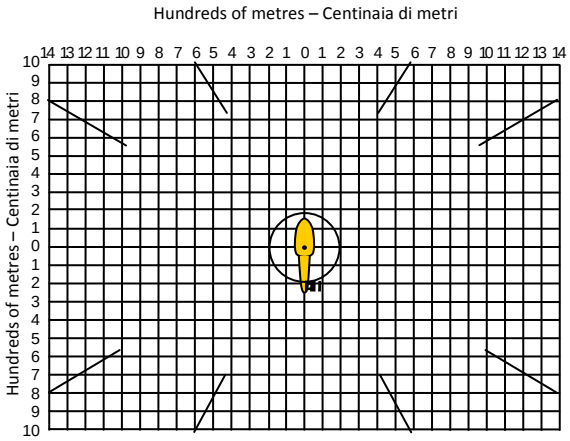
_____

12	DIAGRAM

☐ Airprox ☐ ATC Incident ☐ TCAS RA

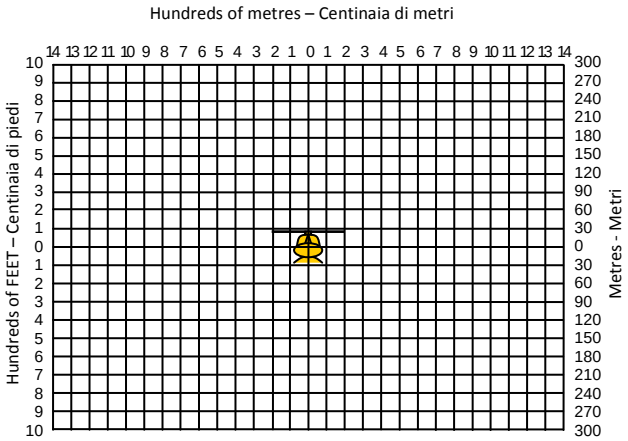
Diagram of aircraft proximity:

Mark the passage of other aircraft relative to you, in horizontal plane on the left and in elevation on the right, assuming YOU are at the centre of each diagram. Include first sighting and passing distance.



VIEW FROM ABOVE

VISTA DALL'ALTO



VIEW FROM ASTERN

VISTA FRONTALE

13	AIRPROX / ATC

Avoiding action taken: ☐ Yes ☐ No Reported to ATC: ☐ Yes ☐ No

Pitch: ☐ Up ☐ Down Heading _____ deg.

Radio station in contact with: ☐ AFIS ☐ TWR ☐ APP ☐ ACC ☐ FIC

Name of station: _____ Freq. used: _____

ATC instructions issued: _____

Cleared altitude: _____ Min. vert. separation: _____ ft Min. horiz.separation _____ m/NM

Any other information considered important:

_____

14	TCAS

Alert: ☐ RA ☐ TA ☐ None Sequence of events: ☐ ATC info ☐ TA ☐ RA ☐ Visual

RA followed: ☐ Yes ☐ No Max. vertical deviation from flightpath: _____ ft

RA instructions, initial: _____ Additional: _____

Was TCAS alert: ☐ Necessary ☐ Useful ☐ Nuisance

Intruder flightpath: ☐ Climbing ☐ Level ☐ Descending

Please describe intruder aircraft type, markings, colour, lighting, callsign, direction of flight etc.:

_____

Flight safety documents

SAFETY MANAGER
Xyz Air
Company address

Flight safety documents

Fold

.....

Fold

APPENDIX B

SAFETY OBJECTIVES
Year 2012

	Item	Objective	Effective											
			1	2	3	4	5	6	7	8	9	10	11	12
			1trim			2trim			3trim			4trim		
			1sem						2sem					
ZERO ACCIDENT	Number of accidents	0%	0	0	0									
ZERO ACCIDENT	Number of operative incidents		0	0	1									
ZERO ACCIDENT	Number of technical incidents		2	1	4									
ZERO ACCIDENT	Number of other incidents		0	0	0									
ZERO ACCIDENT	ERP activation	1	0	0	0									
SAFETY CULTURE	Number of safety meetings (Safety Board)	3	0	0	2									
SAFETY CULTURE	Number of safety drills (exercise)	1	0	0	2									
SAFETY CULTURE	Number of operative personnel trained	100%	0	0	1									
SAFETY CULTURE	Number of technical personnel trained	100%	0	1	2									
SAFETY PROMOTION	Number of Safety Bulletins/Magazines	2	0	0	0									
SAFETY PROMOTION	Number of safety meetings (personnel)	1	0	0	0									
SAFETY IMPROVEMENT	Number of safety analysis		1	2	0									
SAFETY IMPROVEMENT	Number of safety audits													
SAFETY IMPROVEMENT	Personnel satisfaction (survey)	95%	100%	98%	95%									

APPENDIX **C**

INITIAL NOTIFICATION
This is an initial report of an occurrence or safety concern finding

Date:	Number: IN __/__

Distribution:	☐ Acc. Manager	☐ Operation P.H.	☐ CAMO P.H.	☐ Training P.H.

Safety occurrence or concern description:

Preventive analysis:

Initial Risk Assessment: ***Acceptable*** ☐ ***Tolerable*** ☐ ***Unacceptable*** ☐

RISK PROBABILITY	**RISK SEVERITY**				
	NEGLIGIBLE (A)	MINOR (B)	MAJOR (C)	HAZARDOUS (D)	CATASTROPHIC (E)
FREQUENT (5)	**5 A**	**5 B**	**5 C**	**5 D**	**5 E**
OCCASIONAL (4)	**4 A**	**4 B**	**4 C**	**4 D**	**4 E**
REMOTE (3)	**3 A**	**3 B**	**3 C**	**3 D**	**3 E**
IMPROBABLE (2)	**2 A**	**2 B**	**2 C**	**2 D**	**2 E**
EXTREMELY IMPROBABLE (1)	**1 A**	**1 B**	**1 C**	**1 D**	**1 E**

Comments and/or recommendations:

Comments and intentions:		Deadline:
Accountable Manager:	_____	_____
Operations P.H.:	_____	_____
CAMO P.H.:	_____	_____
Training P.H.:	_____	_____
Safety Manager:	_____	_____

APPENDIX **D**

SAFETY ALERT NOTICE
Information reported herein can be critical for flight safety

Object:			Number: SAN __/__
Distribution:	☐ All	☐ Pilots	☐ Technical

Description:

Comments and/or recommendations:

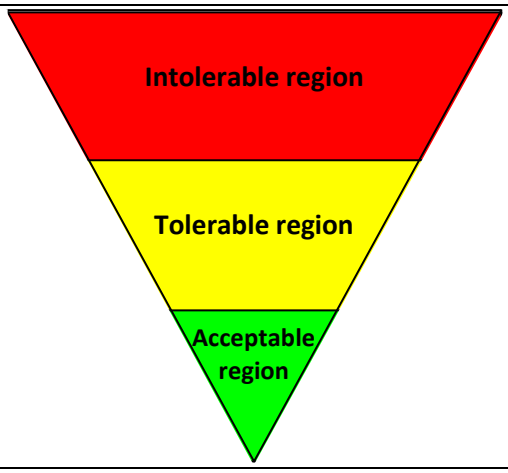
Annexes:

APPENDIX E

RISK MATRIX

RISK PROBABILITY	RISK SEVERITY				
	NEGLIGIBLE (A)	MINOR (B)	MAJOR (C)	HAZARDOUS (D)	CATASTROPHIC (E)
FREQUENT (5)	**5 A**	**5 B**	**5 C**	**5 D**	**5 E**
OCCASIONAL (4)	**4 A**	**4 B**	**4 C**	**4 D**	**4 E**
REMOTE (3)	**3 A**	**3 B**	**3 C**	**3 D**	**3 E**
IMPROBABLE (2)	**2 A**	**2 B**	**2 C**	**2 D**	**2 E**
EXTREMELY IMPROBABLE (1)	**1 A**	**1 B**	**1 C**	**1 D**	**1 E**

Safety Risk Assessment Matrix

SUGGESTED CRITERIA	ASSESSMENT RISK INDEX	SUGGESTED CRITERIA
	**5 C, 5 D, 5 E, 4 D, 4 E, 3 E**	Unacceptable under the existing circumstances
	5 A, 5 B, 4 A, 4 B, 4 C, 3 B, 3 C, 3 D, 2 C, 2 D, 2 E	Acceptable based on risk mitigation. It may require management decision
	3 A, 2 A, 2 B, 1 A, 1 B, 1 C, 1 D, 1 E	Acceptable

Safety Risk Tolerability Matrix

RISK PROBABILITY	MEANING	VALUE
FREQUENT	Likely to occur many times (has occurred frequently)	**5**
OCCASIONAL	Likely to occur sometimes (has occurred infrequently)	**4**
REMOTE	Unlikely to occur, but possible (has occurred rarely)	**3**
IMPROBABLE	Very unlikely to occur (not known to have occurred)	**2**
EXTREMELY IMPROBABLE	Almost inconceivable that the event will occur	**1**

Safety Risk Probability Table

SEVERITY OF OCCURRENCE	MEANING	VALUE
CATASTROPHIC	- Equipment destroyed - Multiple deaths	**E**
HAZARDOUS	- A large reduction in safety margins, physical distress or a workload such that company's or crew tasks are not believed to be performed accurately or completely - Serious injury - Major equipment damage	**D**
MAJOR	- A significant reduction in safety margins, a reduction in the ability of the operator or the crew to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency - Serious incident - Injury to persons	**C**
MINOR	- Nuisance - Operating limitation - Use of emergency procedures - Minor incident	**B**
NEGLIGIBLE	- Little consequences	**A**

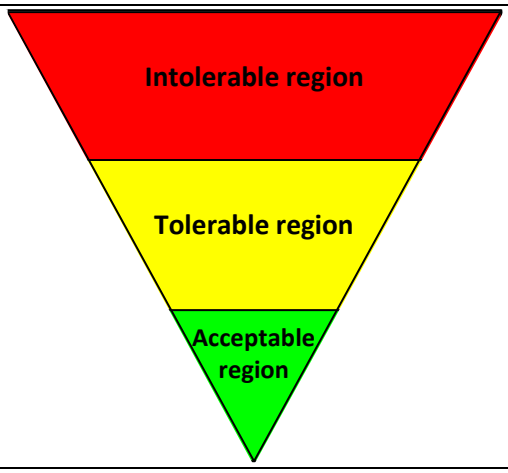
Safety Risk Severity Table

APPENDIX E BIS

RISK MATRIX

RISK PROBABILITY	RISK SEVERITY				
	NEGLIGIBLE (A)	MINOR (B)	MAJOR (C)	HAZARDOUS (D)	CATASTROPHIC (E)
FREQUENT (5)	5 A	5 B	5 C	5 D	5 E
OCCASIONAL (4)	4 A	4 B	4 C	4 D	4 E
REMOTE (3)	3 A	3 B	3 C	3 D	3 E
IMPROBABLE (2)	2 A	2 B	2 C	2 D	2 E
EXTREMELY IMPROBABLE (1)	1 A	1 B	1 C	1 D	1 E

Safety Risk Assessment Matrix

SUGGESTED CRITERIA	ASSESSMENT RISK INDEX	SUGGESTED CRITERIA
	5 C, 5 D, 5 E, 4 D, 4 E, 3 E	Unacceptable under the existing circumstances
	5 A, 5 B, 4 A, 4 B, 4 C, 3 B, 3 C, 3 D, 2 C, 2 D, 2 E	Acceptable based on risk mitigation. It may require management decision
	3 A, 2 A, 2 B, 1 A, 1 B, 1 C, 1 D, 1 E	Acceptable

Safety Risk Tolerability Matrix

ACCEPTANCE CRITERIA

- **Acceptable** Risk Level - the lowest level of risk that can be reasonably reached and on which we estimate that the residual risk can be correctly managed. No further reduction measures are required unless deemed feasible to reduce it to ALARP (As Low As Reasonably Practical).
  This level of risk is not necessarily constant on time. It is measured in function of the complexity of the operation (environment, availability of documentation, qualification of personnel, duration of mission, etc.) This risk assessment depends on the safety data available and it depends on the type of operation involved.

- **Tolerable** Risk Level - effective safety measures must be sought to reduce the risk to a lower level. The company might accept this level of risk in order to obtain significant advantages, while there are not other feasible ways to reduce the risk level.
  The decision to operate at this level of risk is responsibility of CEO and the personnel must be informed and aware of such risk level.

- **Unacceptable** Risk Level - this means that the activity does not present the necessary conditions to continue safely and that activity must stop and cannot resume until the risk level is lowered at least to "**Tolerable** Risk level".

RISK PROBABILITY	MEANING	VALUE
FREQUENT	**Likely to occur many times** (has already occurred in the company (Freq. > 3 x year). Has occurred frequently in the history of the aviation industry)	**5**
OCCASIONAL	**Likely to occur sometimes** (has already occurred in the company (Freq. < 3 x year). Has occurred infrequently in the history of the aviation industry)	**4**
REMOTE	**Unlikely to occur, but possible** (has already occurred in the company at least once. Has occurred rarely in the history of the aviation industry)	**3**
IMPROBABLE	**Very unlikely to occur** (not known to have occurred in the company but has already occurred at least once in the history of the aviation industry)	**2**
EXTREMELY IMPROBABLE	**Almost inconceivable that the event will occur** (it has never occurred in the history of the aviation industry)	**1**

Safety Risk Probability Table

SEVERITY OF OCCURRENCE	MEANING				VALUE
	PERSONNEL	ENVIRONMENT	MATERIAL	IMAGE	
CATASTROPHIC	Multiple fatalities	Massive effects (pollution, destruction, etc.)	Damage> 1 M€	International impact	**E**
HAZARDOUS	Fatality	Effects difficult to repair	Damage< 1 M€	National impact	**D**
MAJOR	Serious injuries	Noteworthy local effects	Damage< 250K€	Considerable impact	**C**
MINOR	Slight injuries	Little impact	Damage< 50K€	Limited impact	**B**
NEGLIGIBLE	Superficial or no injuries	Negligible or no effects	Damage < 10K€	Light or no impact	**A**

Safety Risk Severity Table

APPENDIX F

Evaluated activity :			Type of change	
REF :	Accountable :		Permanent □	Temporary From to

Nature of hazard domain	Added hazard references	Hazard identification register updated on :	SMS manager validation

List of actions	Responsible	Dead line	Action closure :date and visa of responsible

Final closure of process Sum-up of change implementd	Date:	Accountable validation

APPENDIX G

SAFETY DATABASE

The following is the procedure for the integration of the safety database with the SMS Manual.

A database is not required for a proper risk management, but it is strongly suggested due to the big amount of data to be processed. A single occurrence or a single safety study can have several related hazards. At the same time many of these hazards could be linked with other occurrences or safety studies. Finally, every hazard has its own risk level and one or more related defences.

The Xyz safety database is the tool that allows the Safety Department to keep track of the internal safety events, the corresponding hazards, the safety controls and the risk level.
The tool is composed of five files:

- "**Safety Databse.xls**" – This file is used to insert the company events reported by the safety report system. The safety events and concerns are inserted into the following worksheets:
  - Flight Occurrences
  - Maintenance Occurrences

  The Safety Manager will insert all the flight and maintenance occurrences in the corresponding worksheets. Every occurrence can have one or more Undesirable Event that happened or could have happened to that particular occurrence.
  Every Undesirable Event must be inserted in a different record (line).
  The Undesirable Event can be chosen among the already defined Undesirable Event inserted into the "Undesirable Event List.xls" or a new Undesirable Event can be created.
  In the "Corrective Actions" worksheet, the Safety Manager will insert all the corrective actions deemed necessary to reduce the risk of the happening of the Undesirable Event.
- "**Undesirable Events.xls**" – Every Undesirable Event discovered and inserted into the "Safety database.xls" will be transcribed into the Undesirable Event List file. If the undesirable event is not already listed in the file, It will be inserted as new line into the Undesirable Event worksheet. A new worksheet will then be created and named with the event reference number. The new Undesirable Event will be studied in that worksheet.
  In this last worksheet the unwanted incident is studied splitting it in hazards, i.e. in contributing factors that, alone or combined, could lead to the occurrence of that specific incident/accident.
  The hazards will be chosen among the existing hazard list ("Hazard List.xls") or they can be opportunely created.
  For each hazard a safety risk will be calculated and the safety mitigations will be studied and inserted into the worksheet. These mitigations can be transcribed into the safety database as corrective actions when safety measures are requested to the company management.
- "**Safety Studies.xls**" – This file lists all the safety studies and the safety concerns that have been discovered by the Safety Assurance programme. These studies are:
  - Safety Cases (SC)
  - Audits (AU)
  - Management of Changes (MOC)
  - Safety Surveys (SURV)
  - Data Monitoring (DM)

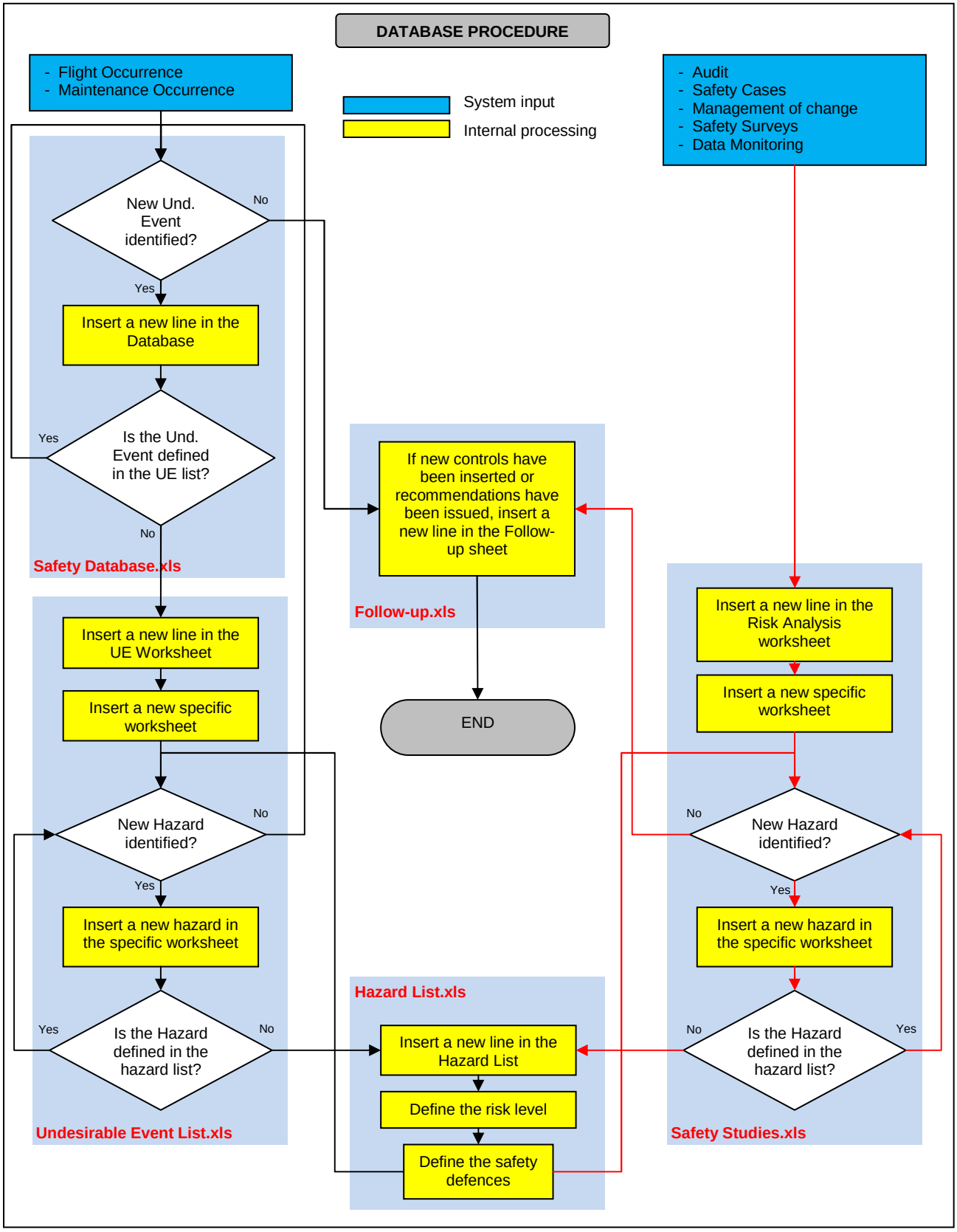
  Each study will be inserted in the Risk Analysis worksheet with its own reference number. Then a new worksheet will be created and it will named with the corresponding reference number. In this worksheet a proper analysis will be done listing all the related hazards and controls. Hazards and controls can be picked from the existing lists or created as new item.

- "**Hazard List.xls**" – This file contains a list of hazards (causal and/or contributing factors) that could be found at least once in incidents or Undesirable Event, as determined by the study of the events/safety studies.
  Generally incidents or accidents are different from each other, but most of time they have some repeating contributing factors (hazards). These contributing factors (hazards) must be identified, classified and valid safety defences must be sought in order to lower the possibility that the hazard will degenerate in incident/accident.
- "**Follow-up.xls**" – This file contains a list of follow-up action taken after an event or a safety case has been studied and a safety recommendation or a safety control/mitigation has been issued.

When new hazards have been spotted, they must be inserted into the "Hazard List.xls" file and they must be analysed. This is the active part of the risk management process. Here the actual risk must be calculated and valid controls/mitigations must be sought for each hazard. It will be these controls/mitigations that the Safety Manager will address to the Post Holders in order to lower the evaluated risk.

All the hazards will be assigned a reference number and they will be recorded on dedicated worksheets inside the "Undesirable Event List.xls" file, for the reported occurrences, or into the "Safety Studies.xls" file for the safety studies.
Each event or safety study will end up with a list of related hazards. These hazards will be recorded into the "Hazard List.xls" file. The event or safety study could contain some hazards which have already been inserted in the "Hazard List.xls" file. For example hazards like "Pilot experience" or "Pilot fatigue" could have already been evaluated in a previous "HEMS Operations" or a "Public Transport" study. These hazards can be picked up directly from the hazard list and the corresponding defences can be used.

The following chart depicts the database procedure and the relations between the database files.



Database files relationship and procedure