Safety Management Systems (Module I)

DGCA

(Updated by; Airworthiness Team)

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SYLLABUS

1. Safety Policy and Objectives
2. Safety Risk Management
3. Safety Assurance
4. Safety Promotion
5. Hazard Reporting
6. Examination

Course Objectives:

On the completion of the course the participants will be able to:

1. Definition of SMS.
2. Approach and implementation.
3. Identify safety hazard.
4. Ensure that *remedial actions* necessary to mitigate the risk/hazards are implemented.
5. Provide for *continuous monitoring and regular assessment* of the safety level achieved.
6. Clearly define lines of safety accountability, including a direct accountability for safety on the part of senior management.
7. Make report the hazard to department concern.

LEGAL BASIS

References :

1. ICAO SMS ANNEX 19;

- ICAO Doc 9859: Safety Management Manual (SMM)

2. R o I Aviation Act No. 1/2009;

- Chapter XIII Article 314

3. CASR Part 19: Safety Management System;

This regulation describes the requirements for an approved service provider as follow:

(i) Approved Training Organization;

(ii) Aircraft Operator Certificate (AOC) in accordance with CASR Part 91, 121, 135;

(iii) Approved Maintenance Organization (AMO) in accordance with CASR Part 145 providing services to operators;

(iv) Organization responsible for the type design or manufacture of aircraft, engines or propellers in accordance with CASR Part 21;

(v) ATS provider in accordance with CASR Part 170, 171, 172, 173, 174, 175, and 176;

(vi) Operator of a certified Aerodrome, in accordance with CASR Part 139.

WHO SHOULD ATTEND THE SAFETY MANAGEMENT SYSTEM TRAINING (RECOMMENDATION)

1. Management Personnel
2. Maintenance and engineering personnel
3. Supporting Staff
4. Third Parties

INTRODUCTION:

The *concept of aviation safety* may have different connotations such as:

- Zero accident (or serious incidents), a view widely held by the traveling Public,
- The freedom from danger or risks,
- The attitude towards unsafe acts and condition by employees,
- The degree to which the inherent risk in aviation and risk are “acceptable”,
- The process of hazard identification and risk management,
- The control of accidental loss (of person and property, and damage to the environment)

ICAO Annex 19

- **Annex 19 was adopted on 25 February 13 becomes applicable on *14 November 2013*.**
- States shall require, as part of their safety program, that an operator implement a safety management system acceptable to the State of the Operator…"
- ICAO: State's "safety programme"

  Definition:
  - An integrated set of regulations and activities aimed at improving safety.
  - Includes SMS requirements for aviation service providers

Overview

ICAO and FAA, EASA, DGCA
SMS Fra

Elements:

3.1 Safety Performance Monitoring & Measurement

Elements:

2.1 Hazard identification and analysis

Process 2.1.1 System and task analysis

Process 2.1.2 Hazard identification

Elements:

1.1 Safety Policy

1.2 Management Commitment & Accountabilities

1.3 Key Safety Personnel

1.4

1.5

Elements:

4.1 Competencies and Training

Process 4.1.1 Personnel requirements

Process 4.1.2 Training

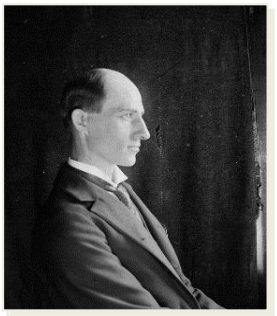
4.2 Communication and Awareness

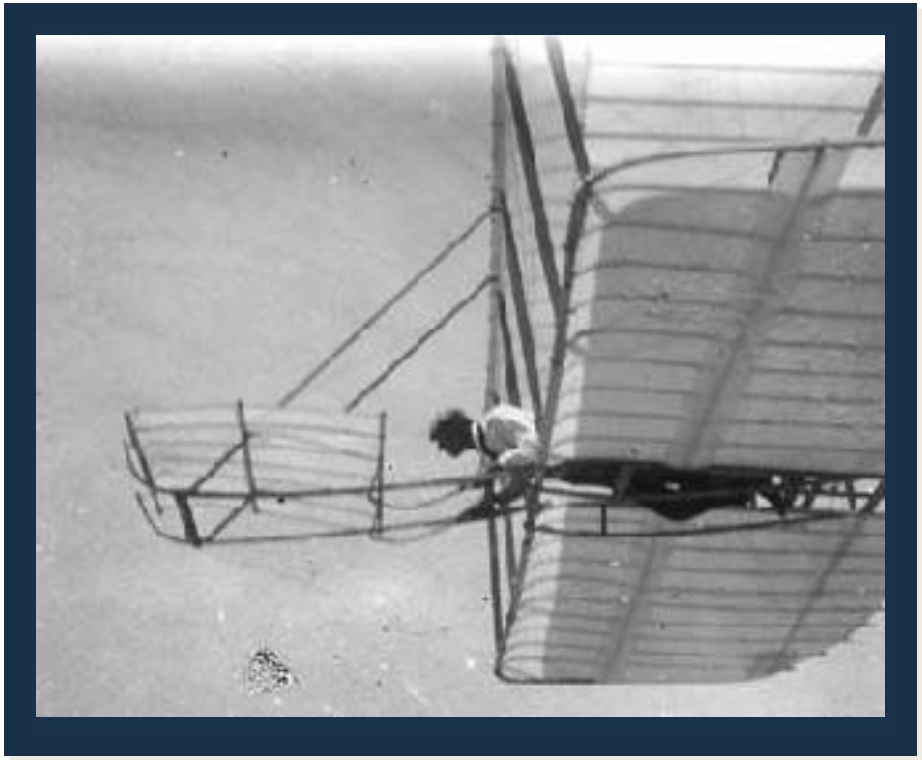
Why Company need safety Management Systems

- Provides a systematic and integrated approach to safety
- Contributes to a positive safety culture
- Increases profitability
- Can remove/reduce operational inefficiencies
- Improves reputation
- Because ICAO & safety regulator say so!!!
- Decreasing insurance costs
- Cheaper than accidents / incidents…

- **Direct costs of an accident:**
  - **Damage to aircraft**
  - **Compensation for injuries**
  - **Lose to property**
- **Indirect costs of an accident (often 5-6 times direct)**
  - **Loss of business and reputation**
  - **Legal fees and damage claims**
  - **Medical cost not covered by worker's compensation**
  - **Fines**
  - **Cost of lost use of equipment (lost income)**
  - **Time lost by injured workers and cost of replacement workers**
  - **Increased insurance premiums**
  - **Aircraft recovery and clean-up.**

"Carelessness and overconfidence are more dangerous than deliberately accepted risk"
Wilbur Wright, 1901





Wilbur Wright gliding, 1901
Photographs: Library of Congress

Deliberately accepted risk

Definition:

What is safety?

- Freedom from harm (Dictionary definition)
- “Risk management” is a more practical term than “safety.” (Jerome Lederer ~1928)
- Carelessness and overconfidence are more dangerous than deliberately accepted risk (Wilbur Wright, 1901)
- Practical safety is ***risk management***

Safety

"Safety is the state in which the risk of harm to persons or property is reduced to, and maintained at or below, *an acceptable level* through a continuing process of hazard identification and risk management"

ICAO Doc 9859

Safety Management

Is deliberate accomplishment of safety by handling, directing, governing, and controlling by responsible people.

Safety Management Systems

A systemic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

Safety Objectives

- Safety management systems provide a systematic way to control risk and to provide assurance that those risk controls are effective.
- "The application of special technical and managerial skills in a systematic, forward looking manner to identify and control hazards throughout the life cycle of a project, program, or activity" (Roland & Moriarty, 1990).
- Traditional approach concentrates on technical.
- SMS *adds* emphasis on management elements.

SAFETY MANAGEMENT SYSTEMS

- Infuses safety into all parts of the system
  - People
  - Tools
  - Procedures
  - Materials
  - Equipment
  - Software

- To maintain the balance of production (profit) and protection (safety)

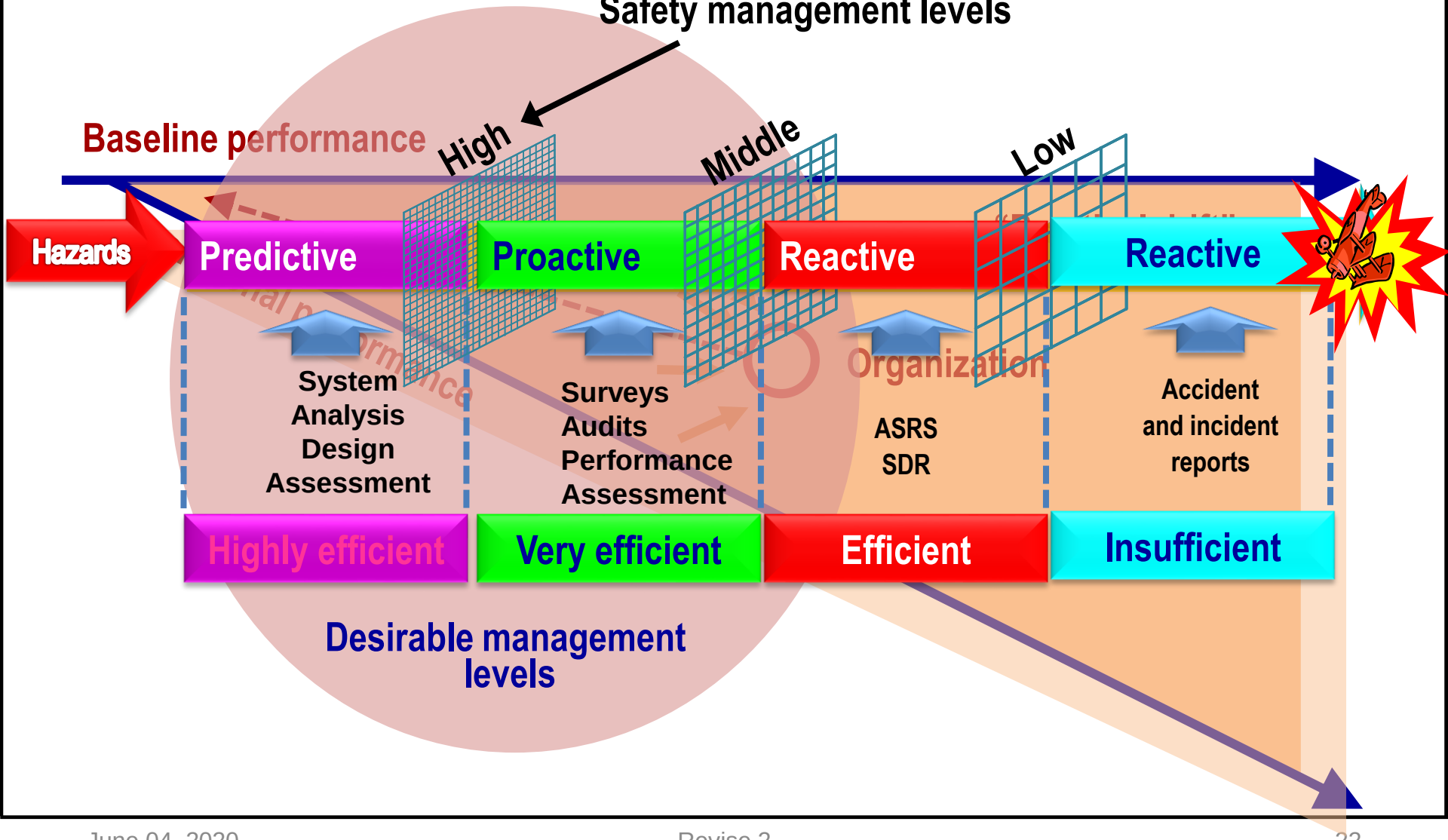
Implementation Challenges

Balance

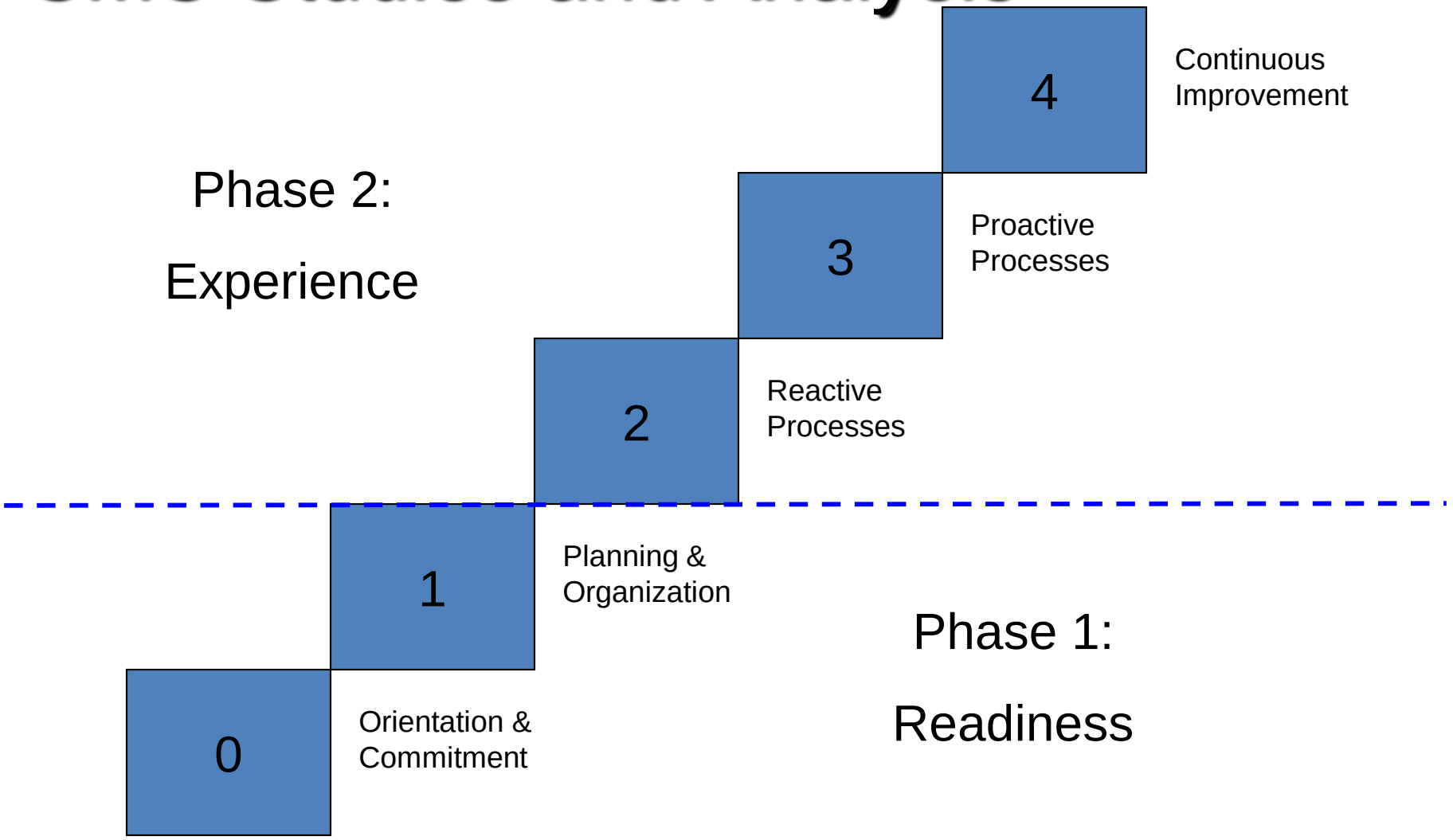
Safety Management Strategies

Reactive (Past)	Proactive (Present)	Predictive (Future)
Responds to events that have already happened, such as incidents and accidents	*Actively seeks the identification of hazardous conditions through the analysis of the organization's processes*	*Analyzes system processes and environment to identify potential future problems*

SM Strategies – Intervention Levels & Tools

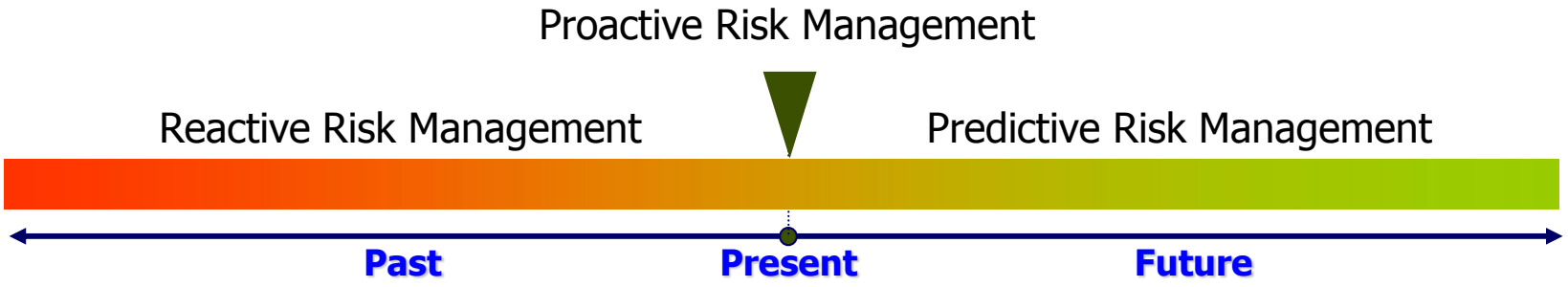


SMS Studies and Analysis



Type of Risk Management

1. Reactive → Reactive to identify hazard in operation
   - Incident /accident Investigation, SDR
2. Proactive → Looking for current potential hazards in the operation
   - Staff survey, Hazard identification network
3. Predictive →Predicting what might happen
   - Change management analysis, Trend analysis



SMS Concepts

- Applying Risk Management
- Assuring Safety Risk Controls

Oversight of Design and Performance of Systems

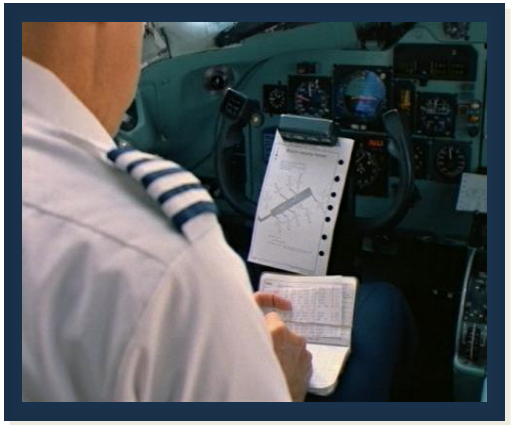
- **Design Assurance**
  - **Using Assessment tools**
- **Performance Assurance**
  - **Using Assessment tools**

Risk Management;

- Understanding the system and environment
- Identifying hazardous conditions
- Assessing risk
- Applying risk controls

Assurance;

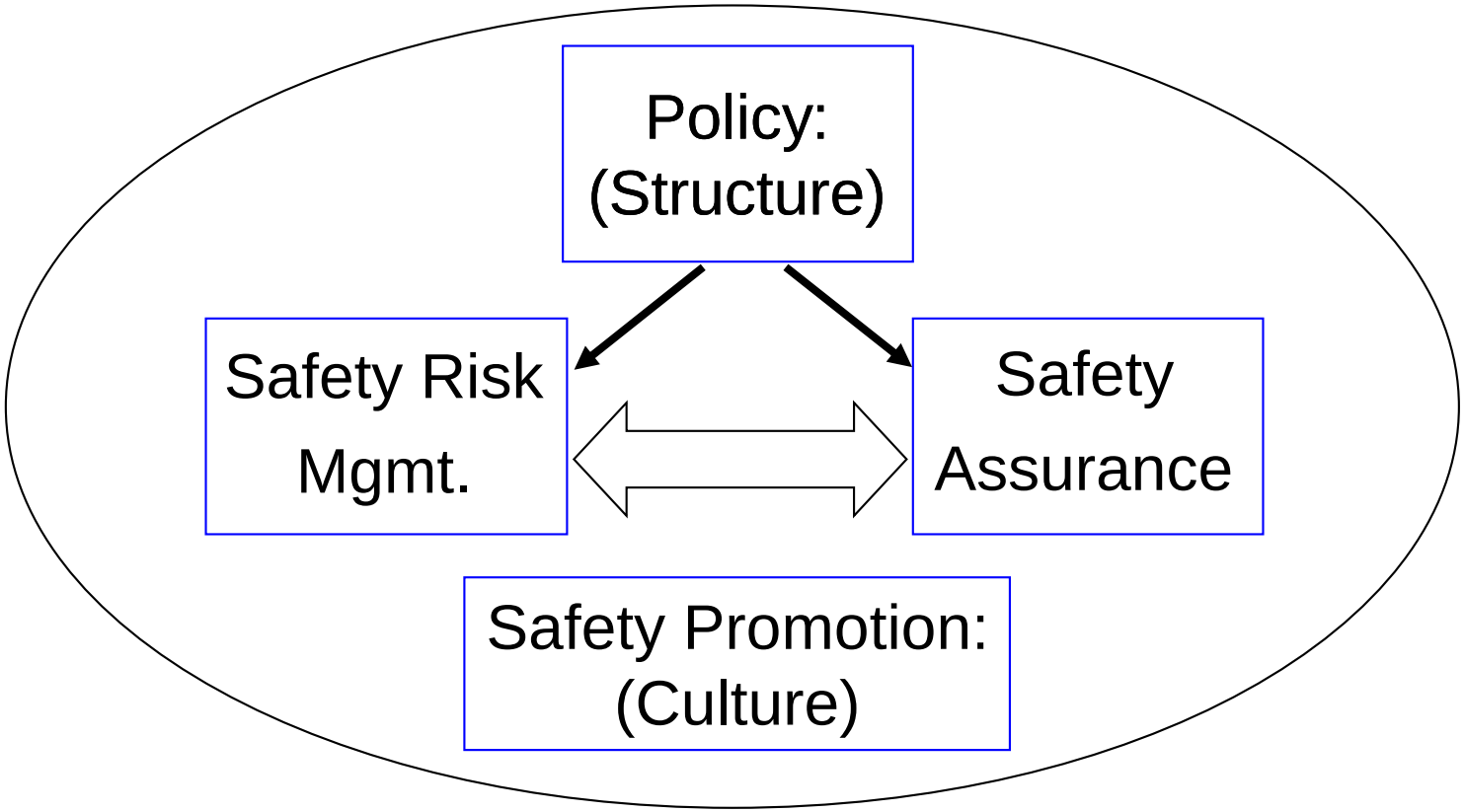
- Assurance: “something that gives confidence”[1]
- Quality assurance: “... focused on providing confidence that quality requirements are being met”[2]
- Likewise, Safety Assurance relates to safety requirements



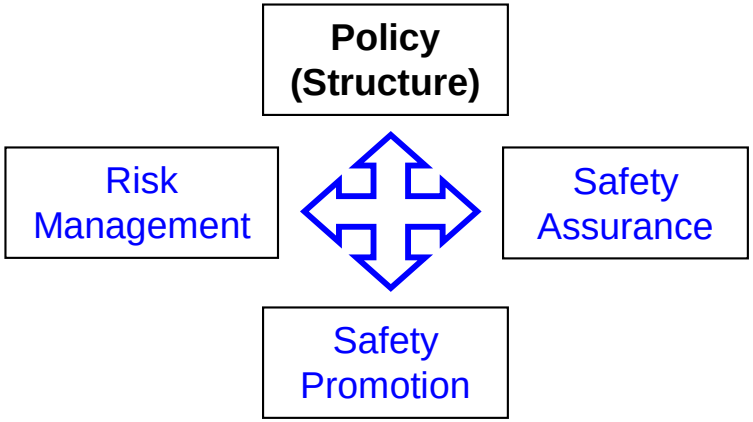
[1] Black’s Law Dictionary

[2] ISO 9000-2000

SMS Components ("Pillars")



The 4 SMS Components



1. Policy

- All management systems must define policies, procedures, and organizational structures to accomplish their goals.
- Policy establishes the structure of the SMS.

1.1 Safety Policy And Objectives

- **Safety Policy**
  - Establishes management commitment and objectives – *what* the management wants.
  - Sets up framework of organizational structures, accountabilities, plans, procedures, and controls to meet objectives.

Safety Policy

Lion Air is committed to maintaining a safe and healthy working environment by observing safety as main priority and excellence of its business.

Every employee; from President Director as Accountable Executive of Safety Management System to operational staff; have the clearly defined accountabilities, responsibilities and equal opportunity to participate in the development and delivery of safety standards.

In order to achieve the highest levels of safety standards and performance, the senior management is committed to:

1. Mandating and facilitating safety as major part of individual responsibility involving all departments, business partners, contractors, and suppliers with no exception, whatever their position and hierarchical status.
2. Performing the process safety risk and hazard management associated with the company operations through the implementation and continuous improvement of Safety Management System.
3. Evaluating the achievement level periodically using measured performance indicators against the pre-determined realistic objectives and/or targets through management reviews.
4. Ensuring that all staff is provided with adequate and appropriate information, training, competency, and provision of necessary resources of safety standards.
5. Developing and encouraging the safety reporting culture including the promotion of positive safety culture to all employees by 'Non Punitive' policy that will guarantee no adverse action taken against them. However, illegal activity, willful or deliberate violations will not be tolerated.

This Safety Policy reflects the company commitment to the safety culture and issued under the authority of the highest level of management in the organization.

This policy shall be communicated throughout the organization and will be reviewed periodically to ensure the relevance and continuation improvement for management system of the company.

Jakarta, 4 October 2018

Rudy Lumingkewas
President Director

Lion Air berkomitmen untuk menjaga lingkungan kerja yang aman dan sehat dengan mematuhi peraturan keselamatan sebagai prioritas dan keunggulan utama dari bisnisnya.

Setiap karyawan; dari President Director sebagai penanggung jawab utama Safety Management System sampai kepada staff pelaksana; memiliki tanggung jawab dan kesempatan yang sebanding untuk berpartisipasi dalam pengembangan dan pelaksanaan standar keselamatan.

Dalam rangka mencapai kinerja dan standar keselamatan tertinggi, manajemen senior berkomitmen untuk:

1. Mengharuskan dan memfasilitasi keselamatan sebagai bagian utama dari tanggung jawab individu yang melibatkan semua departemen, mitra bisnis, kontraktor, dan pemasok, tanpa terkecuali posisi dan jabatannya.
2. Melaksanakan proses pengelolaan bahaya dan resiko keselamatan yang terkait dengan operasi perusahaan, melalui penerapan dan pengembangan Safety Management System yang berkesinambungan.
3. Mengevaluasi tingkat pencapaian secara berkala melalui resensi manajemen dengan menggunakan indikator kinerja yang diukur terhadap tujuan realistis yang telah ditentukan sebelumnya.
4. Memastikan seluruh staf diberikan informasi, pelatihan, kompetensi, dan sumber daya yang memadai dan tepat sesuai dengan standar keselamatan.
5. Mengembangkan dan mendorong budaya pelaporan termasuk pengenalan tentang budaya keselamatan positif kepada semua karyawan melalui kebijakan 'Non Punitive' yang akan menjamin bahwa tidak ada hukuman terhadap pelapor. Akan tetapi, tindakan ilegal dan pelanggaran peraturan yang disengaja tidak akan ditoleransi.

Safety Policy ini mencerminkan komitmen perusahaan terhadap budaya keselamatan dan diresmikan melalui kewenangan manajemen tertinggi organisasi.

Kebijakan ini harus disampaikan ke seluruh lingkungan organisasi dan akan ditinjau secara berkala untuk memastikan adanya kesinambungan dan kelanjutan peningkatan pada sistem manajemen perusahaan.

Lion air
We make people fly

➢ Safety Objectives

Top Management will:

- Implement an integrated, comprehensive SMS for entire organization
- Define a safety policy and set safety objectives
- Define roles, responsibilities, and authorities throughout the organization
- Appoint a member of management to implement and maintain the SMS

1.2 Management Commitment and Responsibility

➢ Management Commitment

- Commitment to:
  - Implement an SMS
  - Continually improve safety
  - Manage safety risk
  - Comply with statutory & regulatory requirements
- Establish clear standards of acceptable behavior
- Documented
- Communicated
- Periodically reviewed

➢ Management Responsibility

- Managers should manage safety in the same way that they manage other areas of the business
- Safety management involves judgment, assessing priorities, and making decisions – like all management decision making

➢ Top Management Involvement

Top management stimulates a healthy safety environment

- Visible, personal involvement of top management
- Setting safety goals and objectives as policy
- Allocation of resources to meet safety goals
- Clear communication

1.3 Safety Accountabilities

- Top management with ultimate authority and responsibility
- Top management requirement to provide resources
- Defined lines of supervision and control
- Defined safety responsibilities for all employees
- Designated management official to ensure effectiveness of SMS (e.g. DOS)

Accountability Defined

Accountability = Obligation or willingness *to account for one's actions*

A SMS shall clearly define lines of safety accountability throughout the *provider* organization, including direct accountability for safety on the part of senior management.

ICAO Doc. 9859

All Lion Group employees have safety responsibilities :

- To comply with the relevant safety requirements, applicable laws, regulations and procedures in all locations where operations are conducted.
- To apply system safety measures as required by safety management procedures and instructions.
- Supporting safety audits and investigations as outlined in safety management system manual.

- To comply with the requirements of personnel who perform operationally critical functions to be physically and medically fit for duties.
- To advise the next level of management of any situation of identifiable hazards and their associated risks or concern affecting system safety through report directly to supervisor and submitting report using safety reporting system.
- Utilize the Safety and Security Reporting System for any confidential human factors related issues in order to received an absolute protection as regulated in Non-Punitive Reporting Policy.

Management Functions

Managers must be *actively* and *personally* involved in:

- Planning: Setting clear goals, guidelines, standards, and timelines for safety
- Organizing: Providing clear lines of management and supervisory responsibility, control and communication
- Directing: Allocation of resources needed for accomplishment of safety goals
- Controlling: Personal involvement in assurance of safety goals and objectives

System Attributes in Management

- The six attributes are the essence of management:
  - Planning: Procedures
  - Organizing: Procedures, Responsibilities & Interfaces
  - Directing: Responsibilities & Authority
  - Controlling: Process Measures & Controls
- Now also documented in the ICAO SMM.

1.4 Appointment Of Key Safety Personnel

Processes must have safety requirements built into their design.

Responsibility: accountable for quality of activities

Authority: power to accomplish required activities

Procedures: clear instructions for members of the organization

Controls: supervisory controls on processes to ensure activities produce the correct outputs

System Attributes

Processes must have safety requirements built into their design.

A. **Responsibility**: accountable for quality of activities

B. **Authority**: power to accomplish required activities

C. **Procedures**: clear instructions for members of the organization

D. **Controls**: supervisory controls on processes to ensure activities produce the correct outputs

In addition, there are process measures and interfaces.

E. **Process Measures:** measurement of both processes & their products

F. **Interfaces:** Recognizing interrelationships between individuals and organizations within the company as well as with contractors, vendors, customers, and other organizations

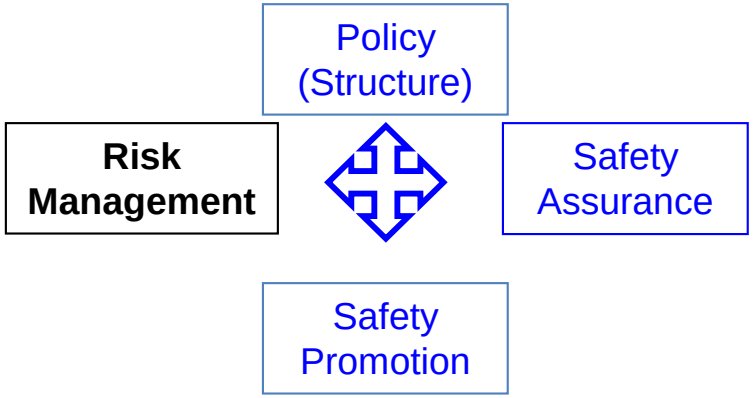
1.5 Coordination Of Emergency Response Planning

- Emergency response
  - Develop and implement procedures to respond to accidents and incidents
  - Describe the organization's intentions and commitment to dealing with emergency situations and their corresponding recovery controls.
  - Outline the roles and responsibilities of key personnel.
  - The Emergency Response Plan can be developed as a separate document or it can be placed in this manual.
- Control of Documents and Records:
  - Have a clearly defined document maintenance process
  - Implement and maintain a safety management plan

1.6 SMS Documentation

- System documentation *conveys* management expectations and work instructions to employees
- May be a stand-alone manual or integrated into existing documentation systems

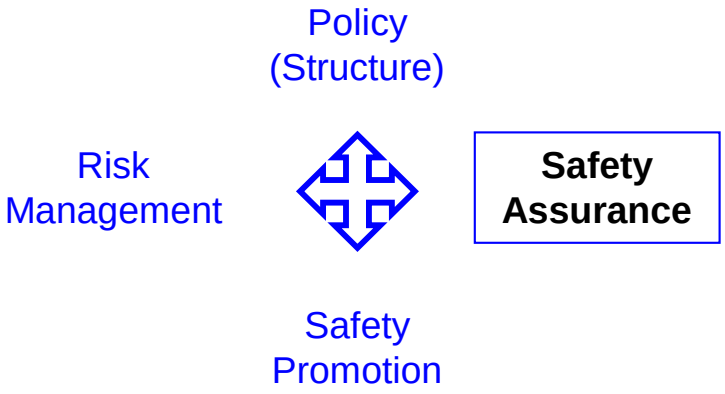
The 4 SMS Components



2. Safety Risk Management.

- A formal system of hazard identification, analysis and risk management is essential in controlling risk to acceptable levels.

The 4 SMS Components

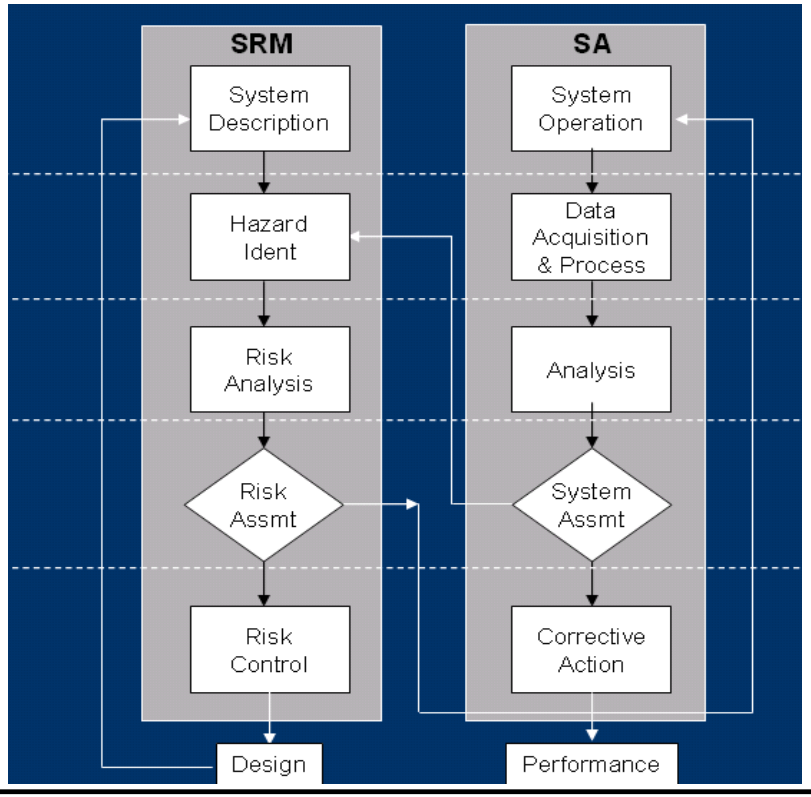


3. Safety Assurance.

- Once controls are identified, the SMS must assure they are continuously practiced and continue to be effective in a changing environment.

Safety Management System - Provides a systematic way to:

1. Identify hazards and control risk
2. Provide assurance that risk controls are effective



Data Quality
Decision Making: Data, Analysis, and Assessment

- Reports (Facts): what exists or is happening now

  Inferences (Interpretations)

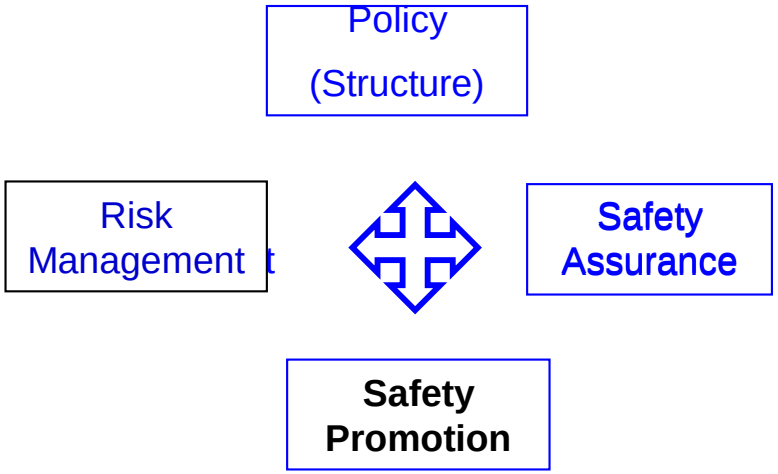
  - What's likely to happen in the future, based on what's happening now
  - Conclusions based on facts

  Judgments: value, quality assessments (e.g. good, bad, acceptable, unacceptable) of what is or will exist or happen

Example:

- Facts (Conditions):
  - Duty day is 14 hours
  - Flight schedule is 8 hours
  - Flights have 10 legs, 10 IFR approaches
  - Flights are legal (within regs.)
- Inference (Hazard):
  - Crew fatigue will probably result
- Inference (Risk analysis):
  - Likelihood of crew errors will increase
- Judgment (Risk Assessment):
  - Unacceptable risk

The 4 SMS Components



4. Safety Promotion.

- The organization must promote safety as a core value with practices that support a positive safety culture.

Safety Campaign 2009, Soekarno Hatta


FOD
Find it, pick it up


Lion
JAGALAH LANDASAN UDARA
BEBAS DARI
FOD
PERIKSALAH BENDA-BENDA BERIKUT :
Mur - Baut - Sekerup - Ring - Batu - Logam
Sampah - Karet - Perangkat Yang Terlepas
Tumpahan Minyak

"THE SKY IS WIDE

BUT THERE IS NO FOR

ERROR"

THANK YOU

Safety Management Systems (Module II)

(Updated by; Liek Haryanto)

2. Safety Risk Management

Definitions :

Safety management systems provide a systematic way to control risk and to provide assurance that those risk controls are effective.

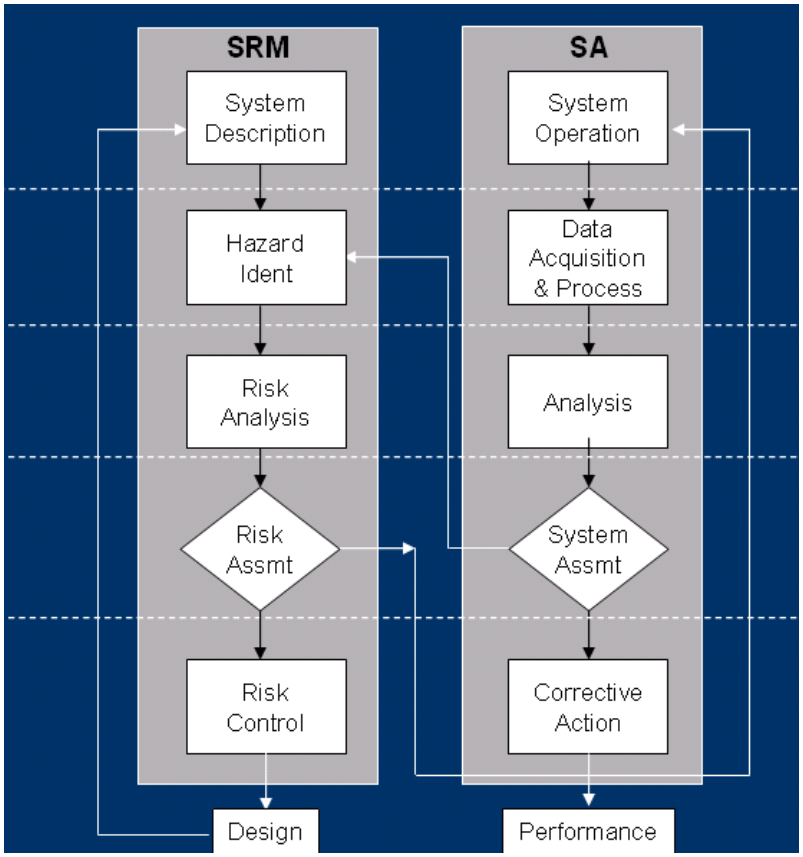
Safety Risk Management is a formal system of hazard identification, analysis and risk management essential *in controlling risk to acceptable levels*.

Levels of Risk Management

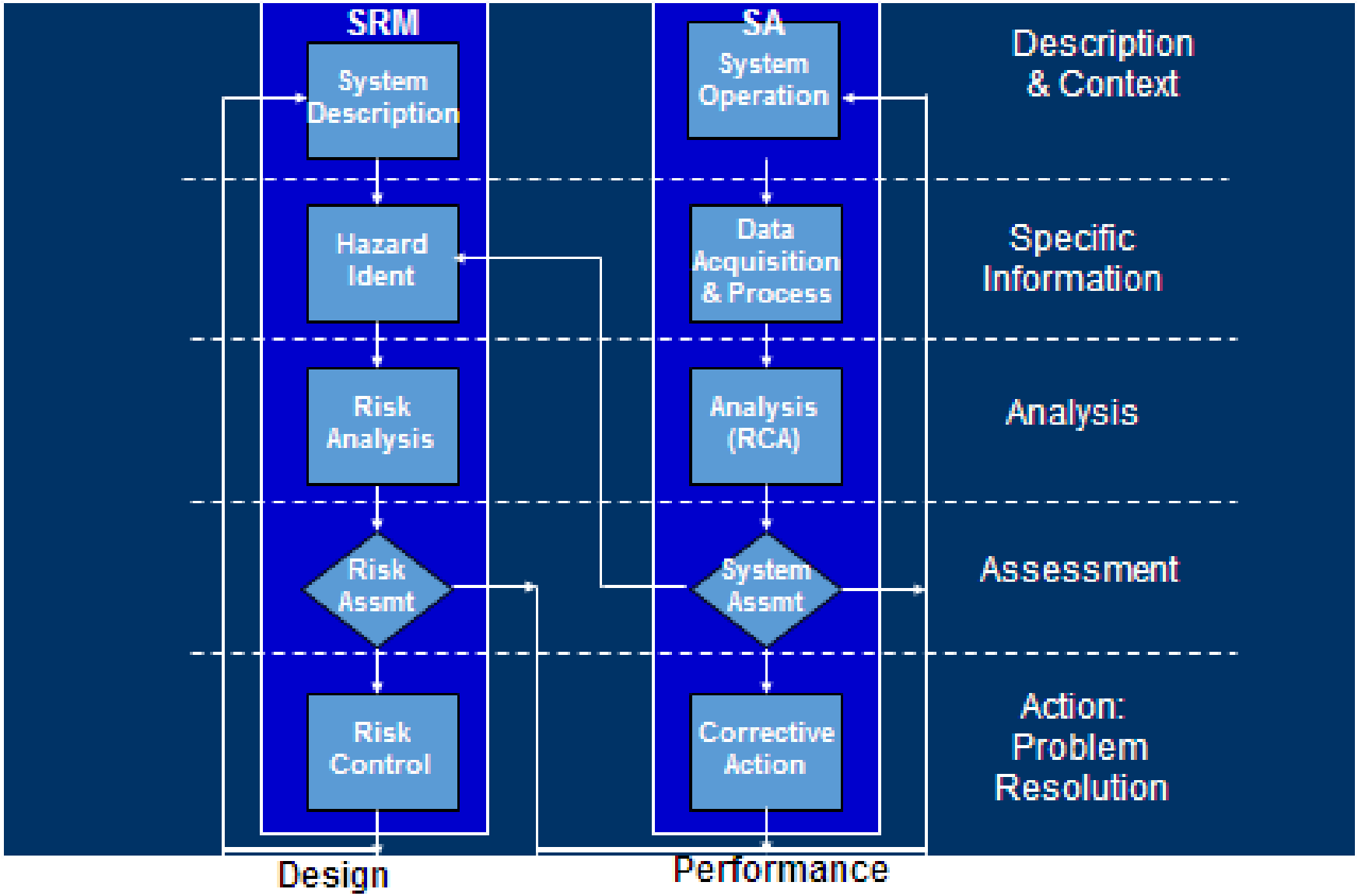
- **Process Risk Management**
  - Policy (What)
  - Procedure (How)
  - Controls
- **Operational Risk Management**
  - Operational Control (Flight/Task/Mission)
  - Crew/Team (Real time decision making)

Safety Management System Provides a systematic way to:

1. Identify hazards and control risk
2. Provide assurance that risk controls are effective



Safety Risk Management (SRM) and Safety Assurance (SA) Workflow



2.1 System Description

What is *System* & Task Analysis?

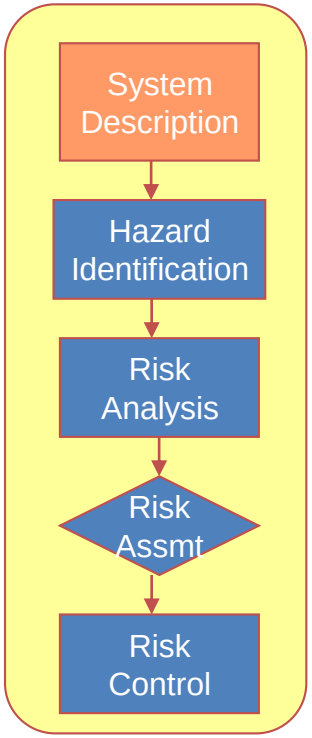
- It is a system *design* function.
- It is a predictive method of hazard identification.
- It is the foundation for *sound* safety analysis.

When is it used?

- Used during implementation *phases* of SMS.
- Used *in conjunction with* all operational changes.

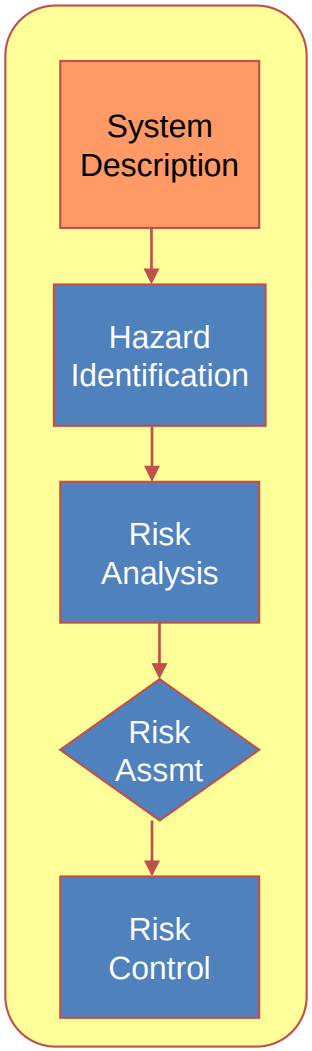
Who uses System & Task Analysis?:

- Personnel within the organization *who form an appropriately diverse team:*
  - Stakeholders
  - Subject Matter Experts



ICAO Doc. 9859

System Description



Facts

Processes

Activities

Workplace Conditions:

Variable Human Performance

System Factors & Attributes

e.g.

- **Equipment**
- **Information (Procedures)**
- **Facilities**
- **Phys. Environment**
- **Other Proc. (Interfaces)**
- **Training**
- **Supv./Mgmt. (Controls)**
- **….**

Typical Workplace Conditions

- Equipment: Human-Machine Interface, Facilities
- Operators: Individual performance
- Crew/team performance
- Organizational culture
- Company/regulator factors

Process (System) Attributes

- Responsibility & Authority
- Procedures
- Controls
- Process Measures
- Interfaces

Conditions Related to Error

- Time pressure
- Procedures and documentation
- Teamwork/documentation
- Shift turnovers/crew briefings
- Group norms
- Fatigue management (shifts/circadian problems)

Alan Hobbs, ATSB (2008)

Conditions Related to Error (cont.)

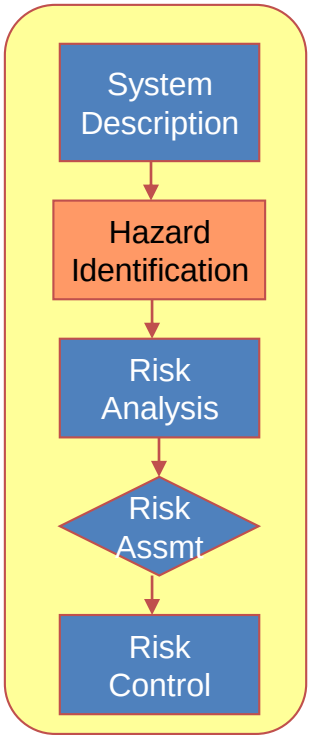
- Lack of System Knowledge
- Equipment/facilities
- Human-machine interface (e.g. design for maintainability)

2.2 Hazard Identification

A hazard is any real or potential *condition*…

that can result in *injury*, *illness*, *or death* to people; *damage to, or loss of*, a system (hardware or software), equipment, or property; and/or damage to the operating environment.

ICAO Doc. 9859



Typical of Hazard

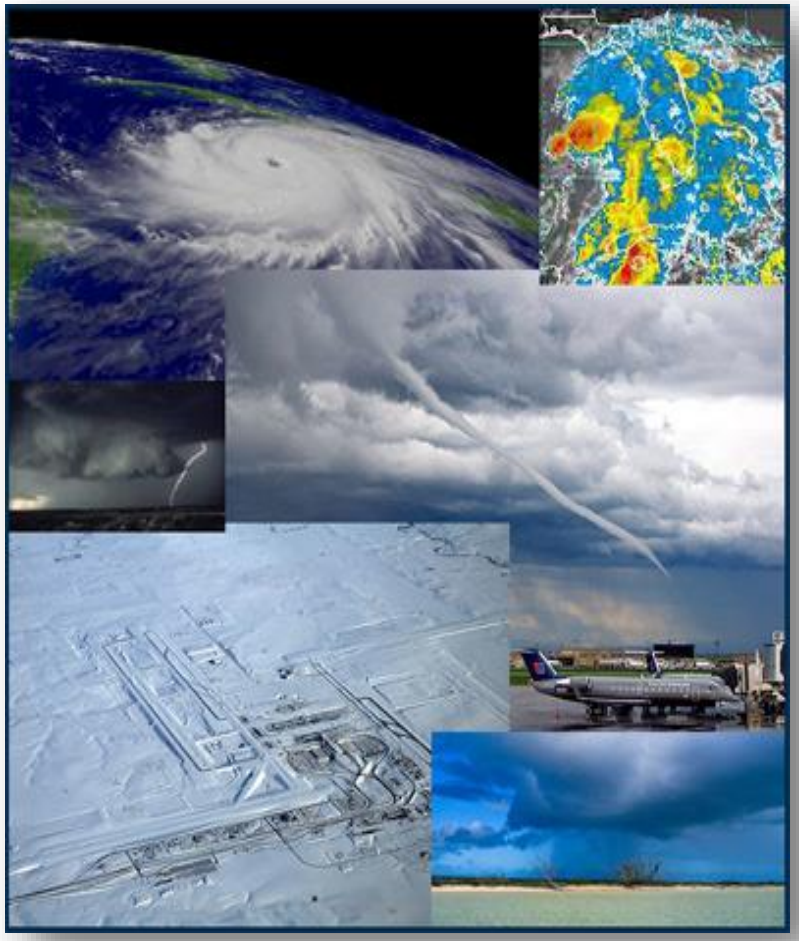
NATURAL HAZARD

Severe weather or climatic events:
E.g.: hurricanes, major winter storms, tornadoes and wind shear.

Geophysical events:
E.g.: earthquakes, volcanoes, tsunamis, floods and landslides.

Geographical conditions:
E.g.: adverse terrain or large bodies of water.

Environmental events:
E.g.: wildfires, wildlife activity, and insect or pest infestation



Technical and Economy Hazard

- **Deficiencies regarding:**
  E.g.: aircraft and aircraft components, systems, subsystems and related equipment.
- **Major trends related to:**
  Growth.
  Recession.
  Cost of material or equipment.
  Etc.

Passenger stairs not in locked

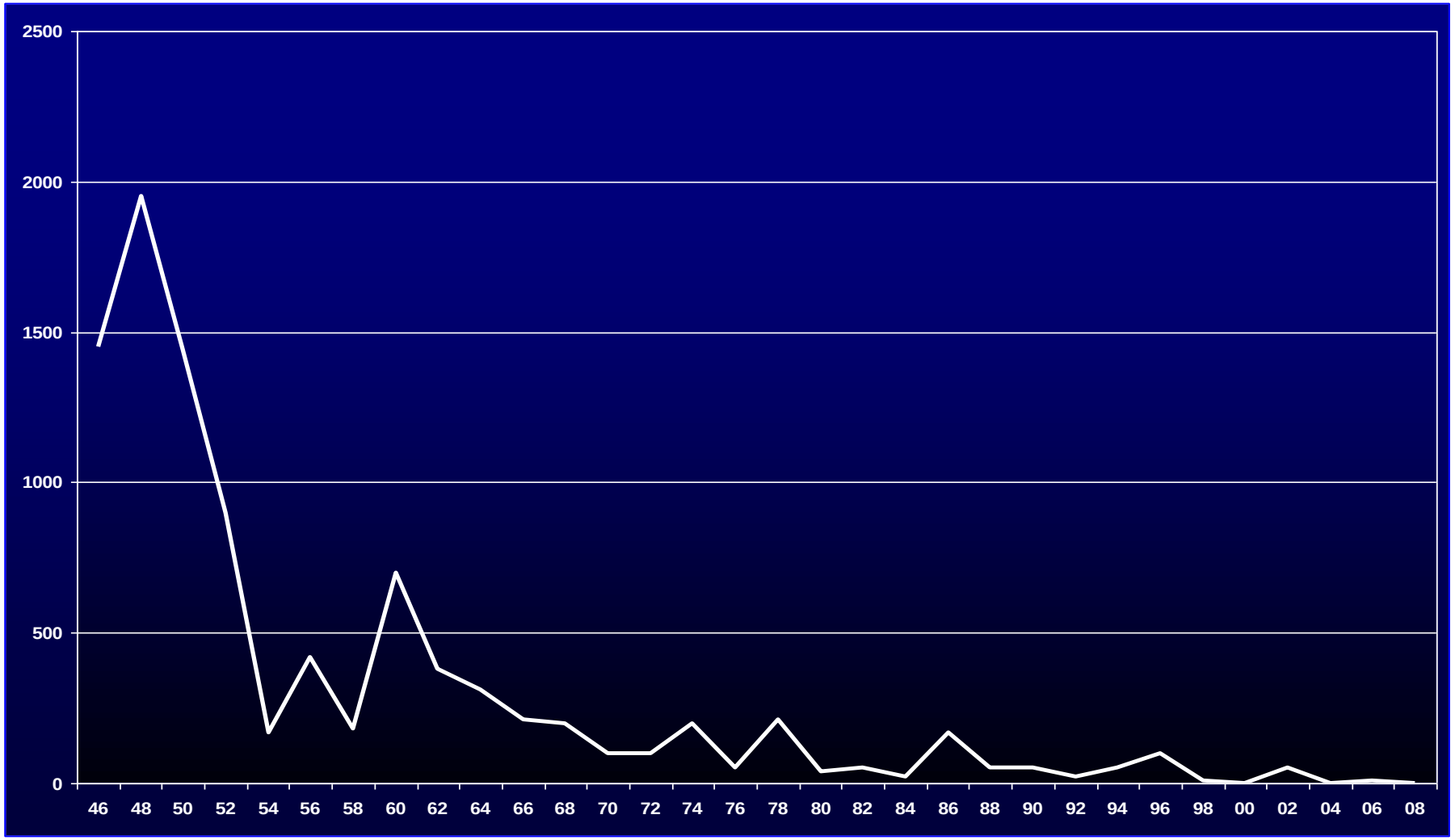
Passenger stair hit aircraft

Bird Near Airport

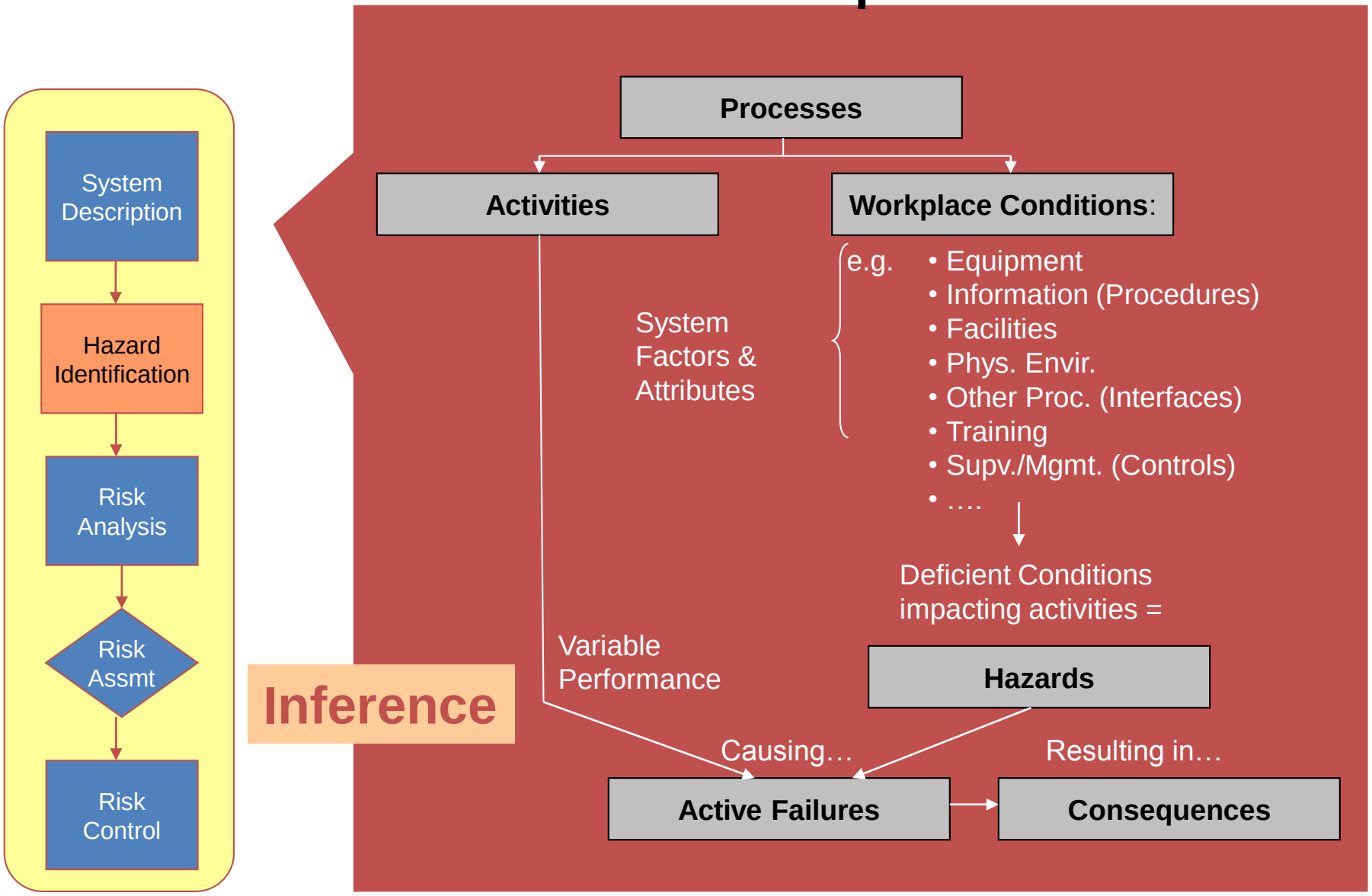
-Bird Strike
-Aircraft damage

Fatalities per 100 Million Passenger

Part 121 Operations 1946 - 2007

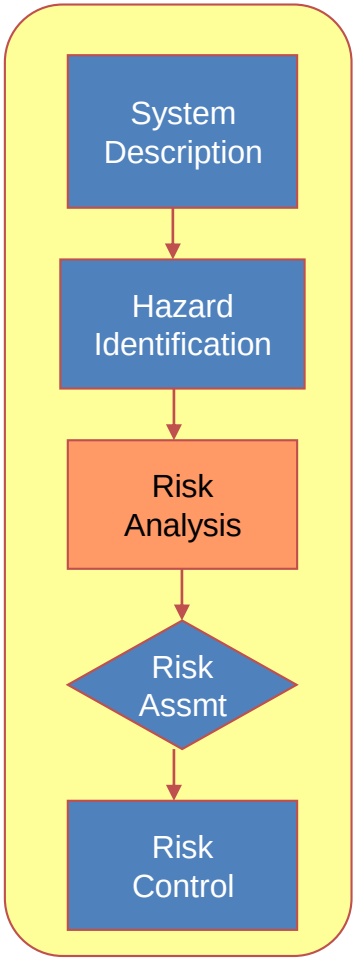


Hazard Identification from Workplace Conditions

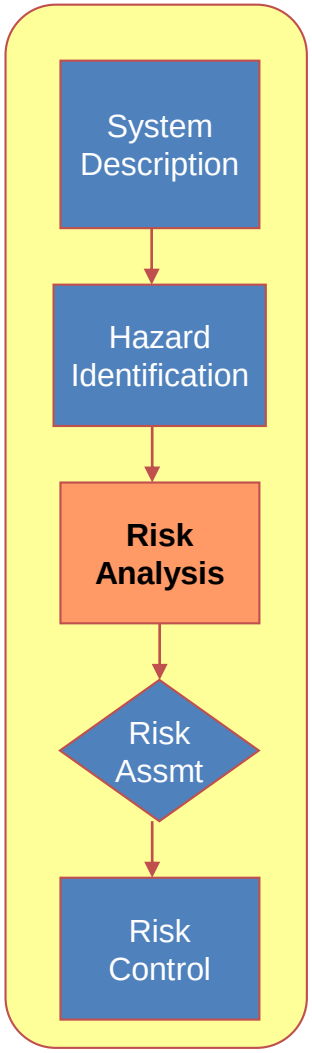


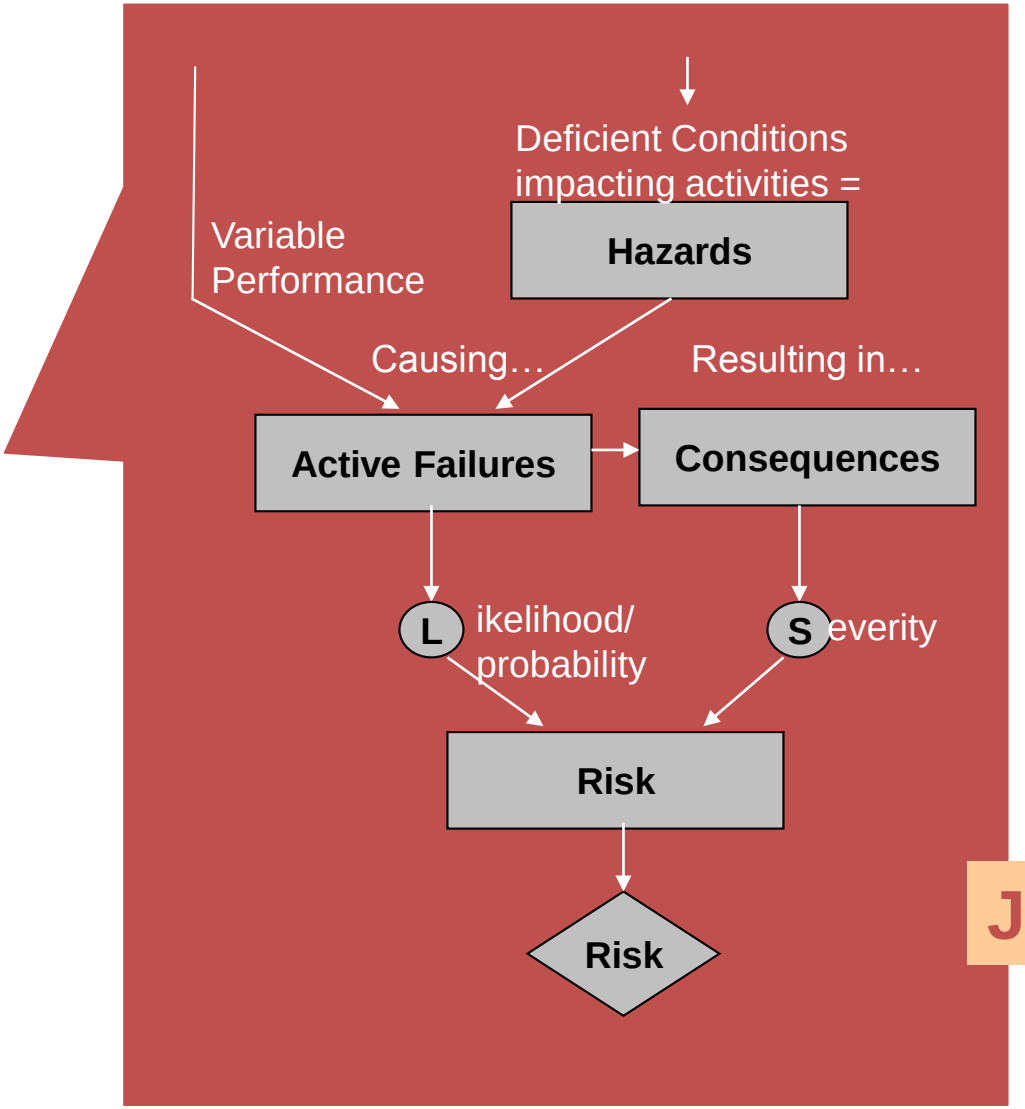
2.3 Risk Analysis

- Important to distinguish between:
  - *Hazard* – a condition
  - *Consequence* – result
  - *Risk* – likelihood & severity of the consequence
- Analyzing risk involves the consideration of both the likelihood and the severity of any adverse consequences.



From Hazard to Risk

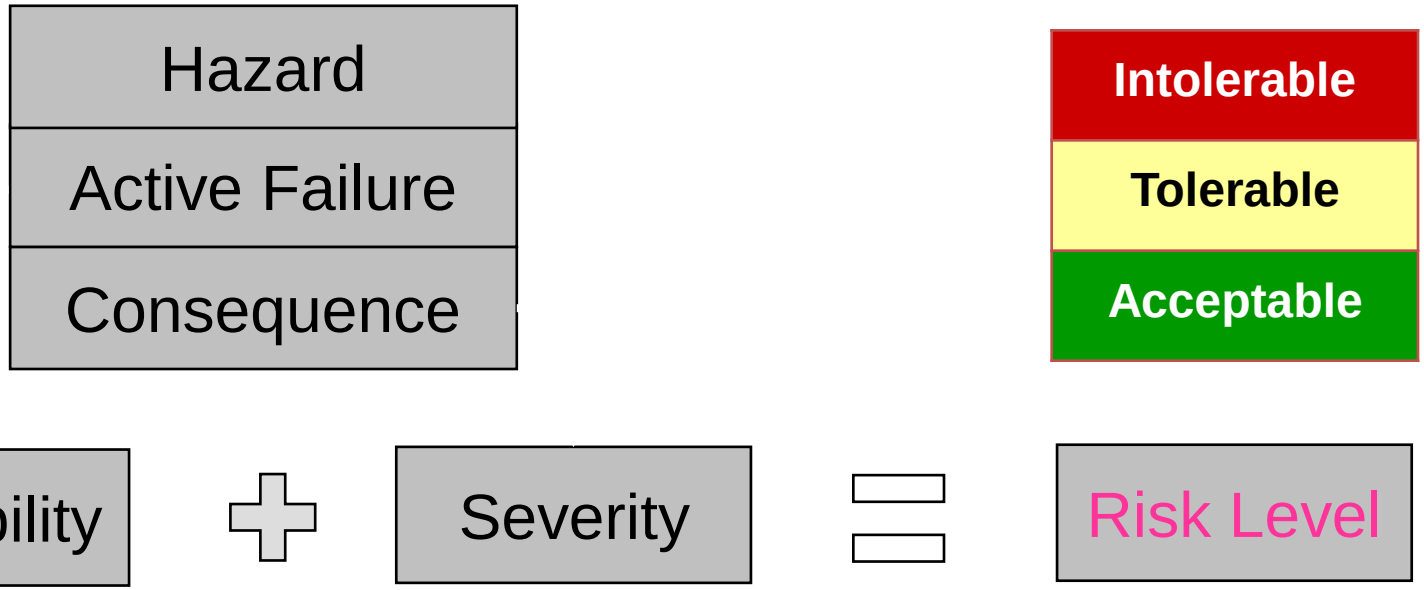




Judgment

Risk Analysis

Risk is the composite of the predicted ***likelihood or probability*** **and** ***the severity*** of each possible consequence of each identified hazard.



Adapted from ICAO Doc. 9859

Risk Probability

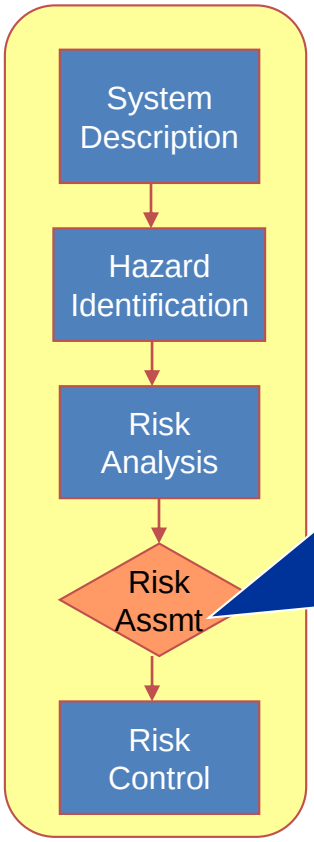
Probability of occurrence		
Qualitative definition	**Meaning**	**Value**
Frequent	*Likely to occur many times (has occurred frequently)*	**5**
Occasional	*Likely to occur some times (has occurred infrequently)*	**4**
Remote	*Unlikely, but possible to occur (has occurred rarely)*	**3**
Improbable	*Very unlikely to occur (not known to have occurred)*	**2**
Extremely improbable	*Almost inconceivable that the event will occur*	**1**

Risk Severity

Severity of Occurrences		
Aviation Definition	**Meaning**	**Value**
Catastrophic	• Equipment destroyed • Multiple deaths	**A**
Hazardous	• A large reduction in safety margins, physical distress or a workload such that the operators cannot be relied upon to perform their tasks accurately or completely. • Serious injury or death to a number of people. • Major equipment damage	**B**
Major	• A significant reduction in safety margins, a reduction in the ability of the operators 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 limitations. • Use of emergency procedures. • Minor incident.	**D**
Negligible	• Little consequences	**E**

2.4 Risk Assessment

Risk assessment determines the level of risk to use in making a bottom line decision.



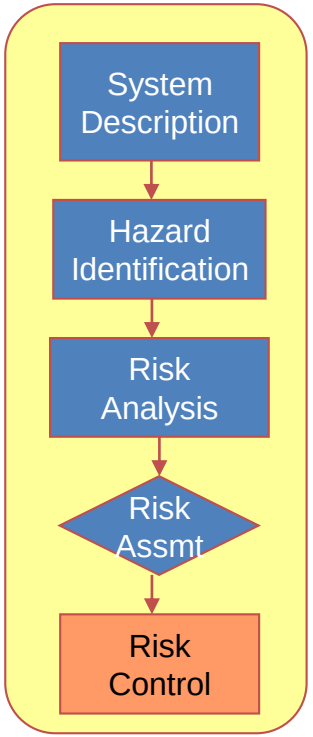
Risk Likelihood /Probability		Risk Severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

A risk matrix is a tool used for risk assessment. It can vary in form yet it accomplishes the same purpose.

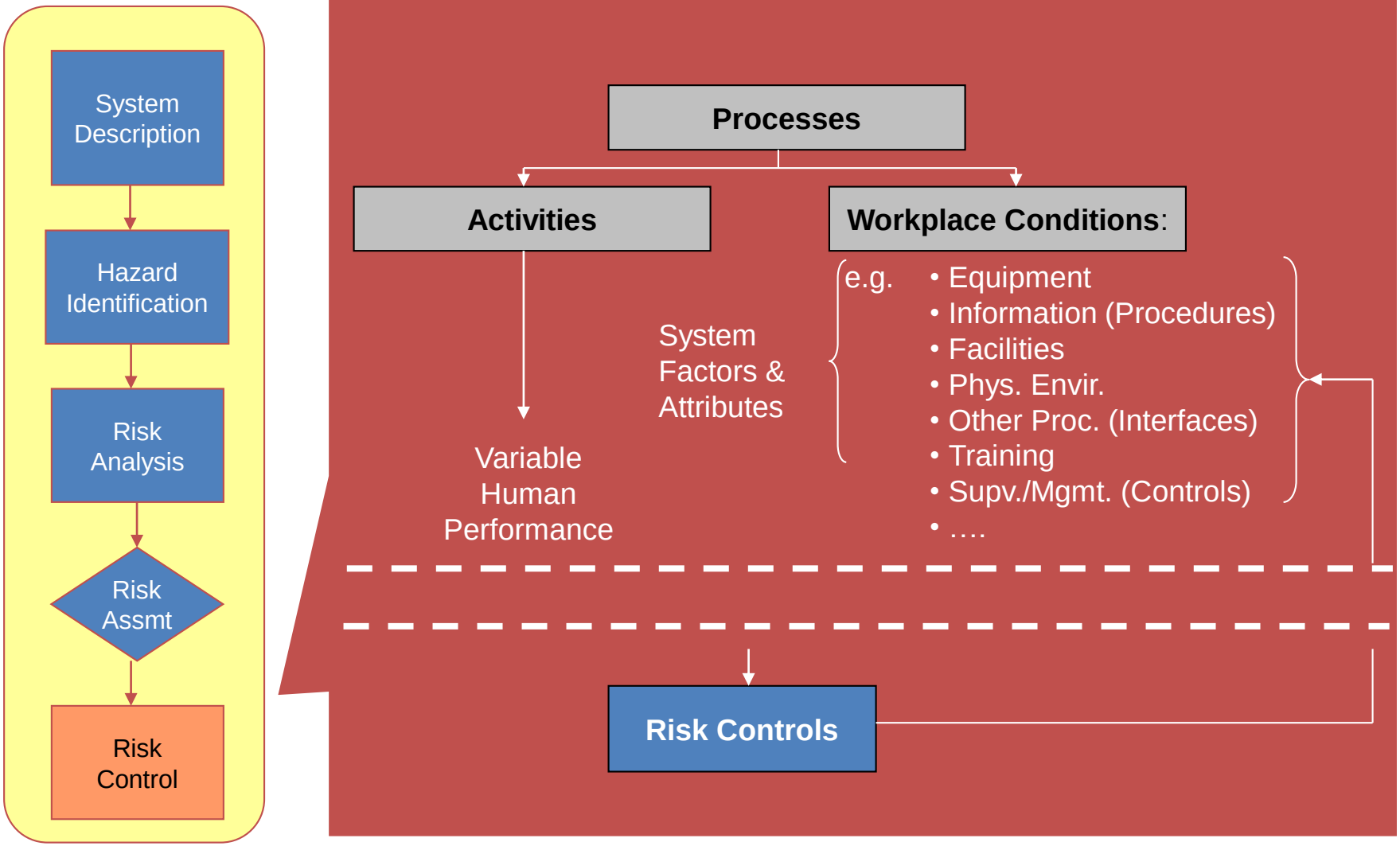
2.5 Risk Control = Risk Mitigation

A major component of any safety system is the **defenses (controls)** put in place to protect people, property or the environment.

These defenses are used to reduce the **likelihood** or **severity** of the consequences associated with any given hazard or condition.

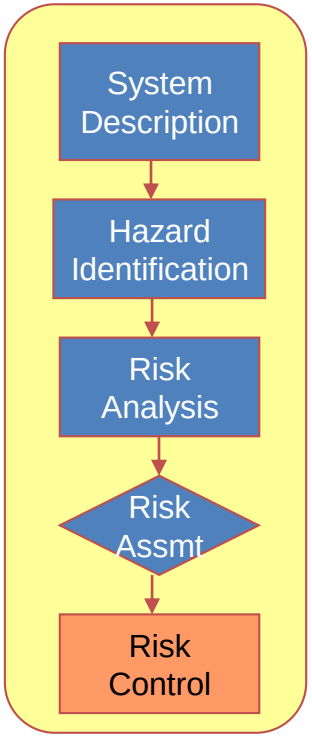


Risk Control/Mitigation



Risk Control Order of Precedence:

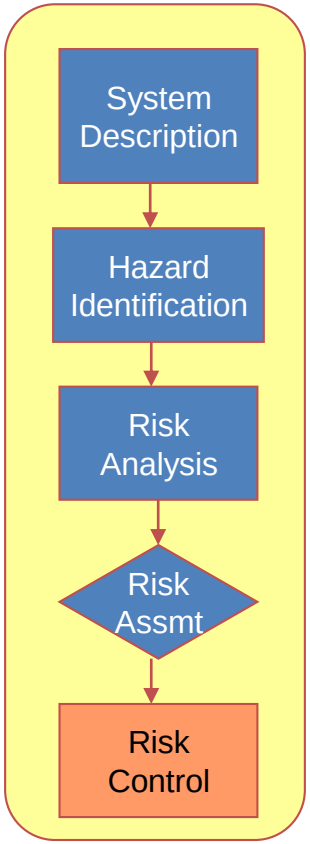
1. Modify the system (design hazard out)
2. Physical guards or barriers
3. Warnings or alert signal
4. Administrative controls
   - Procedures
   - Training



Regulations as Risk Controls

- Rulemaking (SRM)
  - Identified Hazard in the Aviation System
  - Risk Control: Regulation = limits of *acceptability*
- Compliance (Operator's SRM)
  - Operator's Program Design = Risk *Acceptance*

    (still must comply with regulatory requirements)
  - Design Assurance – Certification functions



Continuing Operational Safety (COS)

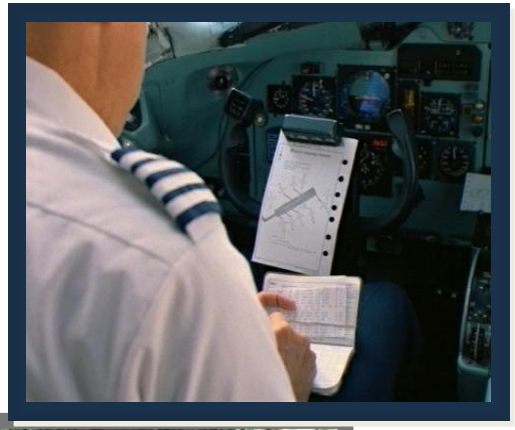
- Risk controls must be continually monitored to ensure their viability. This is accomplished through Continuing Operational Safety (COS)

- COS = Ongoing compliance through:
  - Safety Assurance (Operator)
  - Performance Assurance - Surveillance

3. Safety Assurance

SMS Concepts: Assurance

- Assurance: “something that gives confidence”[1]
- Quality assurance: “... focused on providing confidence that quality requirements are being met”[2]
- Likewise, Safety Assurance relates to safety requirements

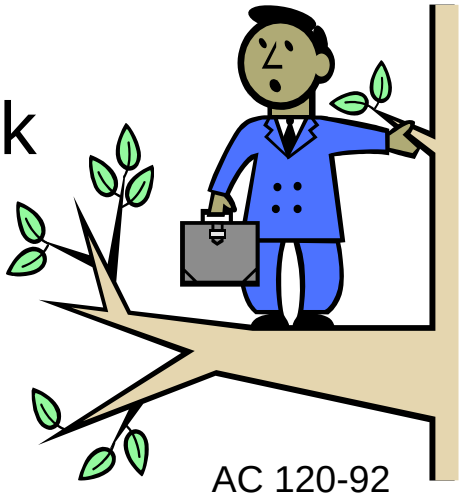


[1] Black’s Law Dictionary

[2] ISO 9000-2000

Safety Assurance Functions:

- Collect and analyze information to determine that process requirements are continuously being met.
- Assess performance and effectiveness of risk controls.
- Works in partnership with Risk Management.



AC 120-92

SA is similar to QA

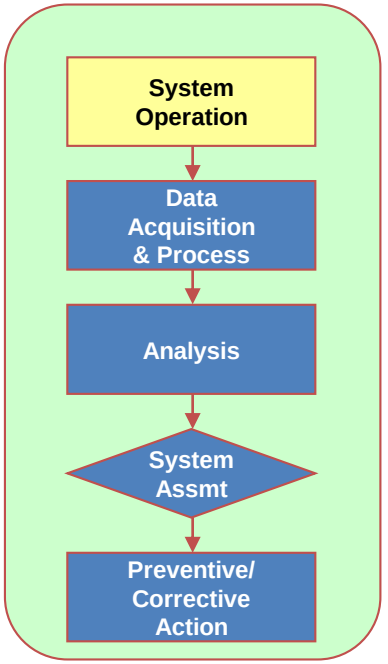
- QA focuses on product conformity & customer satisfaction on a continuous basis.
- SA ensures that risk controls, *once designed and put to place*, perform in a way that continue to meet their safety objectives.
- Integration of management systems may be beneficial.

SA & QA

"*Once controls are in place*, **quality management techniques** can be used to provide a structured process for ensuring that they achieve their intended objectives and, *where they fall short*, to improve them."

AC 120-92

3.1 System Operation



Written documentation to describe:

Who, What, When, Where, Why, How

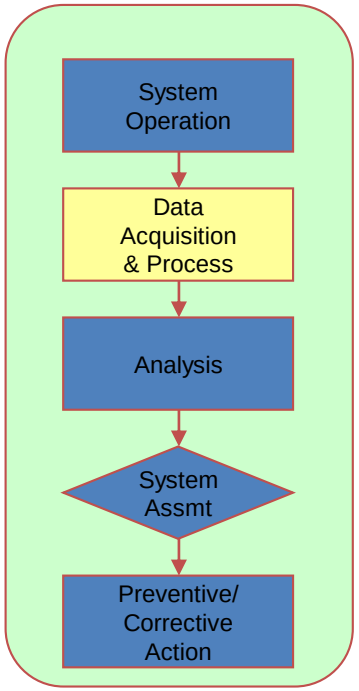
The system operation includes:

Monitoring of risk controls during operations;

System description, including risk controls added during SRM which form the basis for SA functions such as audits and analysis.

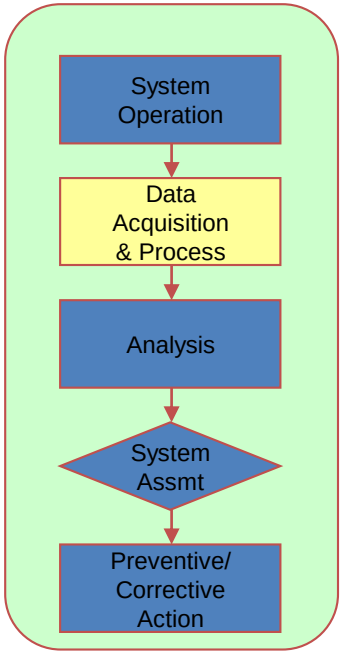
3.2 Data Acquisition & Process

1. Continuous Monitoring
2. Internal Audits
3. Internal Evaluation
4. External Audits
5. Investigations
6. Employee Reporting Systems



AC 120-92

Safety Performance Monitoring and Measurement



Where SRM and SA interface - risk controls

Line managers of operational departments:

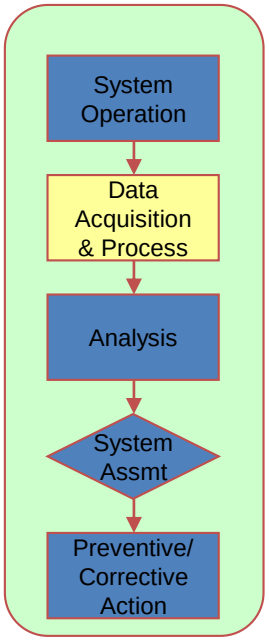
- Accomplish continuous monitoring of day-to-day activities & processes
- Have direct responsibility for process control
- Must ensure that processes in their areas function as designed.

➢ Continuous Monitoring - Operational Data Sources

- Flight dispatch records
- Flight schedules
- Financial data
- Crew schedules and records
- Warranty return reports
- Aircraft discrepancy reports
- Flight cancellation and delay reports

➢ Internal Audits

The day-to-day responsibility for safety management rests with those who "own" the technical processes.

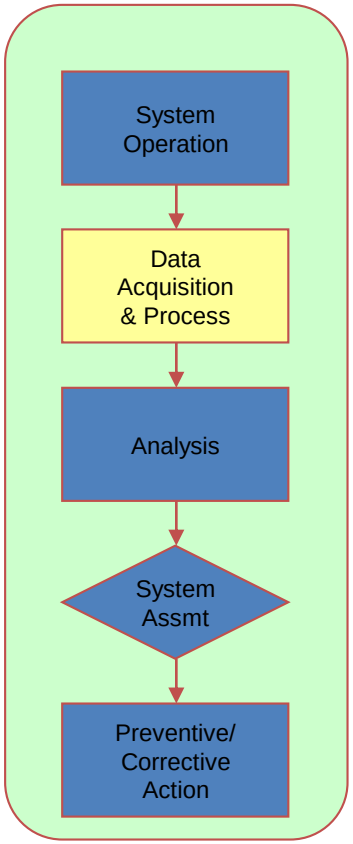


This is where:

- deficiencies in processes contribute to risk
- audits provide feedback to process owners
- direct supervisory control and resource allocation can help to maintain effectiveness of risk controls

Internal Audits (Continued)

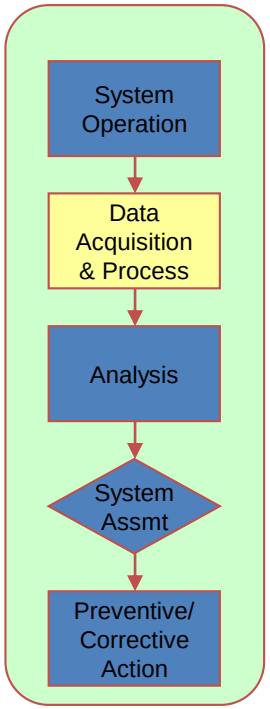
- Performed by each department.
- Department Director/Manager is responsible.
- Regularly scheduled
- Include contractors & vendors
- Determine:
  - Conformity with safety risk controls
  - Performance of safety risk controls
  - Performance to meet business objectives
- Deficiencies always get action!



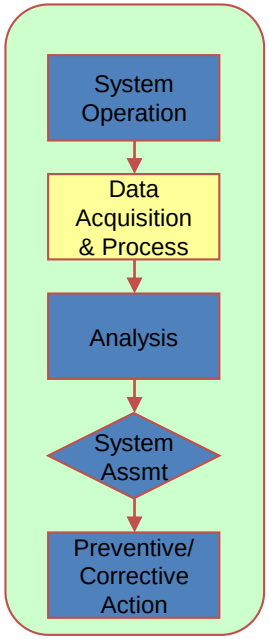
AC 120-92

➢ Internal Evaluation

- Performed by a functionally independent person or organization (e.g. QA, Safety)
- A process-oriented control function
- Backs up the internal audit function
- Uses sampling to validate SA processes

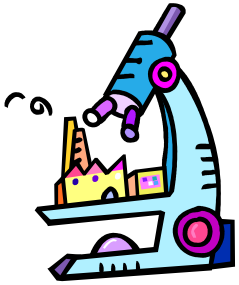


➢ External Audits



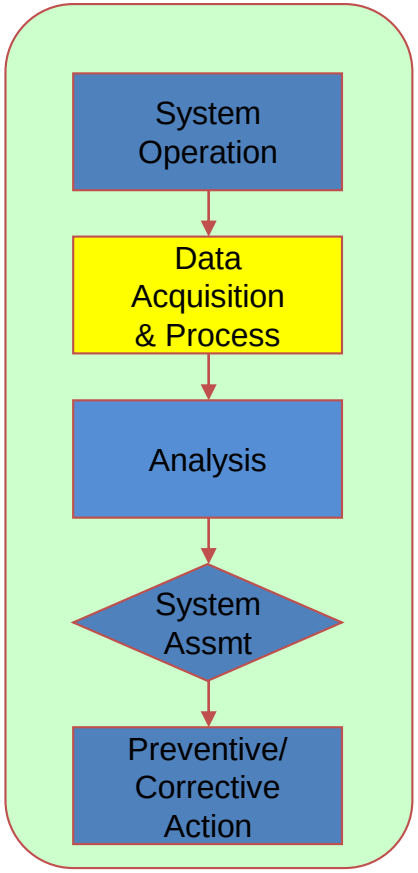
Conducted by:

- Code-share partners
- Industry organizations (e.g. C.A.S.E.)
- Third parties: consultants
- The regulator (NAA) = “Safety Oversight”



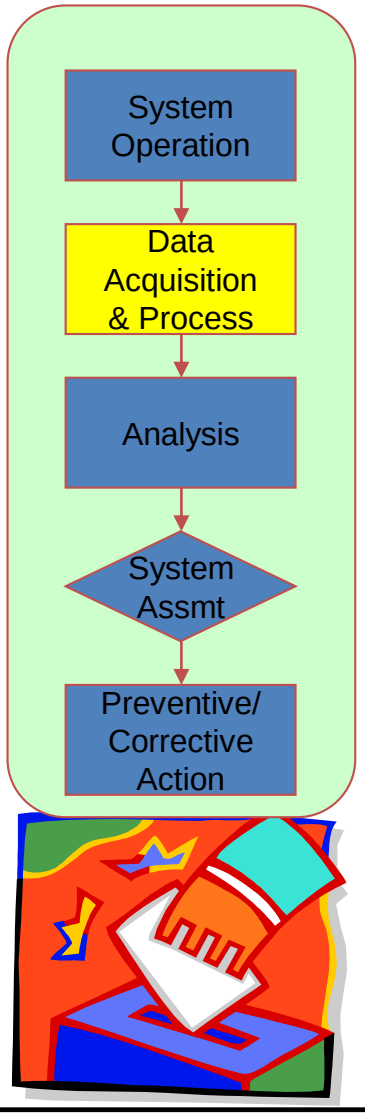
➢ Safety investigations

- For continuity – put the event behind us
  - To put losses behind
  - To reassert trust and faith in the system
  - To resume normal activities
  - To fulfil political purposes
- For improved system reliability
  - To learn about system vulnerability
  - To develop strategies for change
  - To prioritize investment of resources



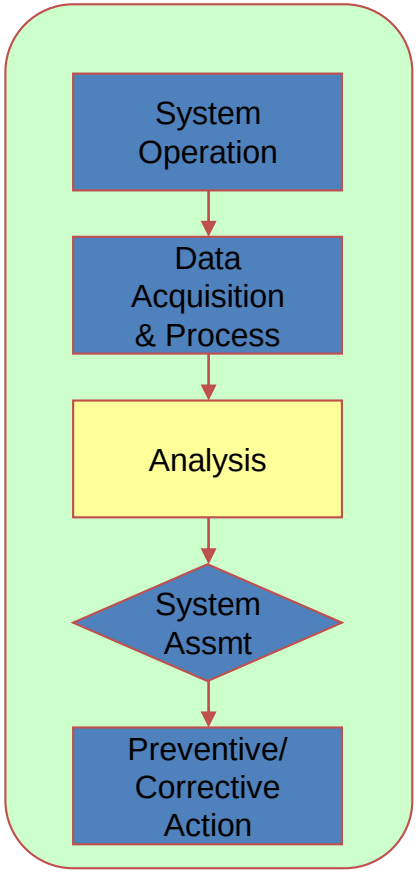
➢ Employee Reporting and Feedback System

- Employee safety reporting & **feedback** system is required.
- Must provide confidentiality.
- Employees must be encouraged to use the system.
- Data may identify emerging hazards.
- Data must be included in analysis.



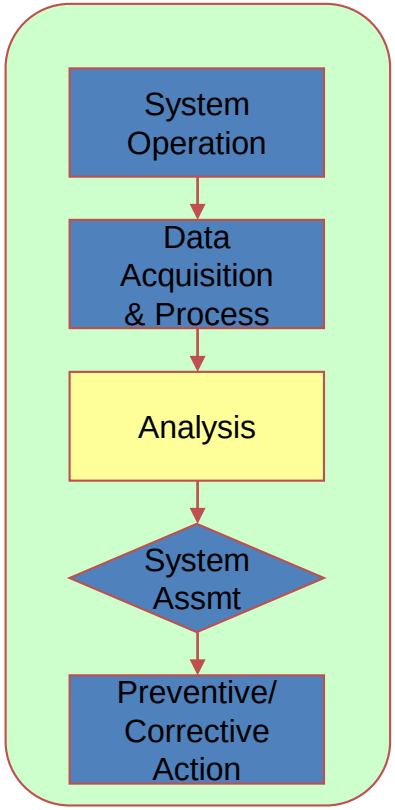
3.3 Analysis

- To be useful, information must be made understandable.
- Analysis is used to determine effectiveness of:
  1. Risk controls in the organization's operational processes, and
  2. the SMS.



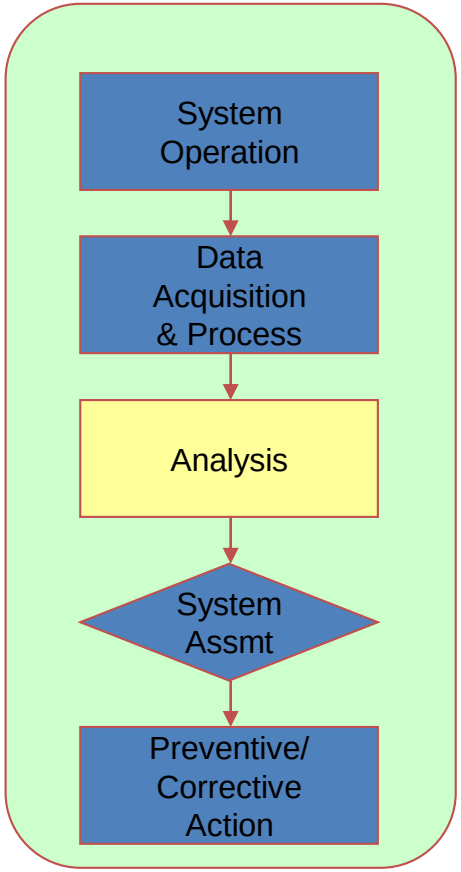
Analytical Measures

- Performance (outputs, outcomes)
- Process (activities, behaviors)
- Leading (looking ahead, predictive)
- Lagging (e.g. accident/incident rates)



○ Types of analysis

- Against criteria/objectives
- Compared to norms
- Patterns from multiple data points
- Trends over time
  - "Trends" is one of the most misused term in analysis
  - Must have stable, reliable measures at each time sample for a valid trend



○ Attributes of Data and Measures

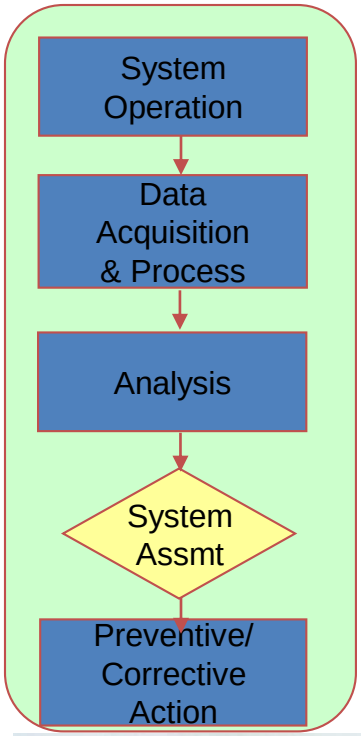
- Validity:
  - Does the data/measure address the subject desired?
  - Does it only address the subject desired?
  - How completely does it cover the subject desired?
- Reliability:
  - Are data points about the same thing comparable?
  - Are data points collected by different observers comparable?

Data and measures must be reliable to be valid but reliable data is not always valid

Training and careful preparation of tools can increase reliability of data

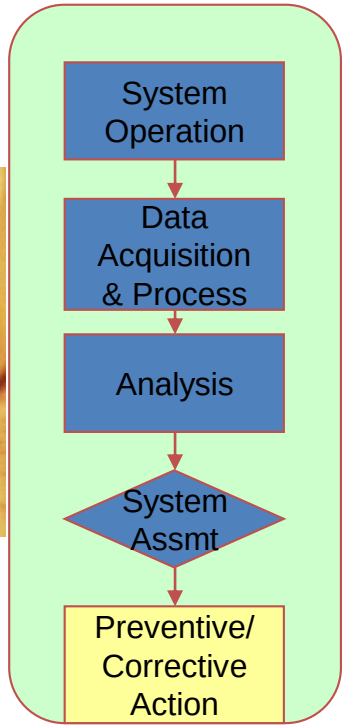
3.4 System Assessment

- Are objectives being met? (“Happy loop”)
- Risk controls failing due to:
  - Lack of supervision
  - Lack of resources
  - Lack of training
  - Poor job aids
- New Hazard/failed Risk Controls (redesign - back to SRM)
- Prioritize according to safety criticality (triage)



3.5 Preventive/Corrective Actions

- Revised policies
- New procedures
- Equipment changes
- Enhanced training
- Schedule changes
- Assignment of responsible persons



❖ The Management Of Change

Top management will conduct regular reviews of the SMS, including:

- The outputs of SRM & SA
- Lessons learned
- Need for changes

❖ Continuous Improvement of the SMS

The organization shall continuously improve the effectiveness of the SMS through:

- Safety and Quality Policies
- Safety Objectives
- Audit & Evaluations
- Analysis of Data
- Corrective and Preventive Actions
- Management Reviews

"THE SKY IS WIDE, BUT THERE IS NO FOR ERROR"

Safety Management Systems (Module III)

DGCA

(Updated by; Liek Haryanto)

4. Safety Promotion

Promotion: Definition

- Safety promotion = a combination of:
  - Safety Culture,
  - Training and
  - Knowledge Sharing

  activities that support the implementation and operation of SMS in an organization

- Organizations must promote safety as a core value with practices that support a positive safety culture.

4.1 SAFETY CULTURE

Is a natural bi-product of corporate culture.

The corporate attitude towards safety influences the employees, collective approach to safety.

To Support a Sound Safety Culture:

1. Senior management commitment
2. Senior management visibility
3. Safety accountability framework
4. Safety policy, goals, objectives, standards, and performance
5. Effective employee safety reporting system
6. Safety information system
7. Resource commitment

4.2 Training and Education

- Employees must understand the SMS
- Employees benefit from safety lessons learned
- Explain why particular actions are taken
- Develop awareness of hazards
- Foster open reporting of safety concerns
- Initial and ongoing training

Safety Management System Training

It is **important that all employees to be familiar with the Safety Management System**. All employees will be given an initial training course that will cover all the following subjects.

Every Safety Management System awareness training will be documented and updated for each employee. These records will be retained for two years.

SMS Processes

ISD Processes

Analyze

- SRM: System / Task Description & Analysis
- •Safety Critical Job Tasks
- •Competencies
- •Target audience characteristics

Design

- •Training Tasks
- •Qualification Standards (SRM risk Control)
- •Courseware

Develop

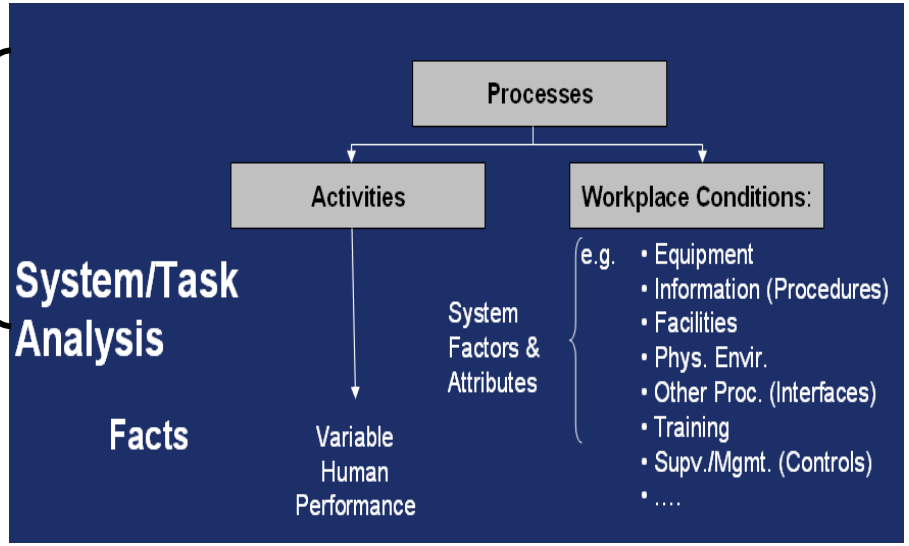
- •Medium
- •Lessons, Exercises activities
- •Tests, Evaluations

Implement

- SA: Monitoring
- •Training Delivery
- •Records
- •Testing/Qualifying

Evaluate

- SA: Assessment
- •Student Evaluation/critique
- •Instructor Critique
- •OJT & performance observations



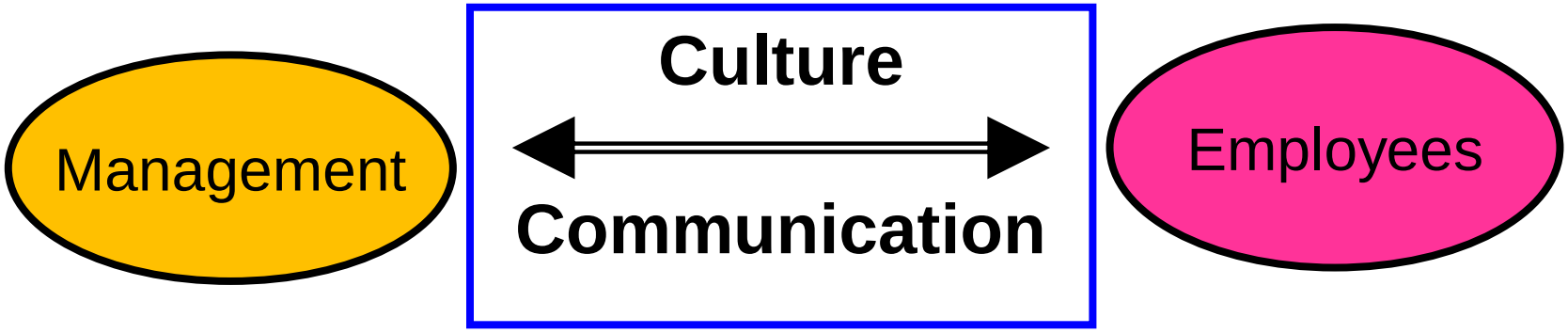
Commitment to SMS

- Documents alone will not guarantee development of a positive safety culture.
- Employees must see evidence of management commitment to SMS.

Management Attitudes & Actions = the most important factor.

ICAO Doc. 9859

4.3 Safety Communication



Informed: People understand the hazards & risks

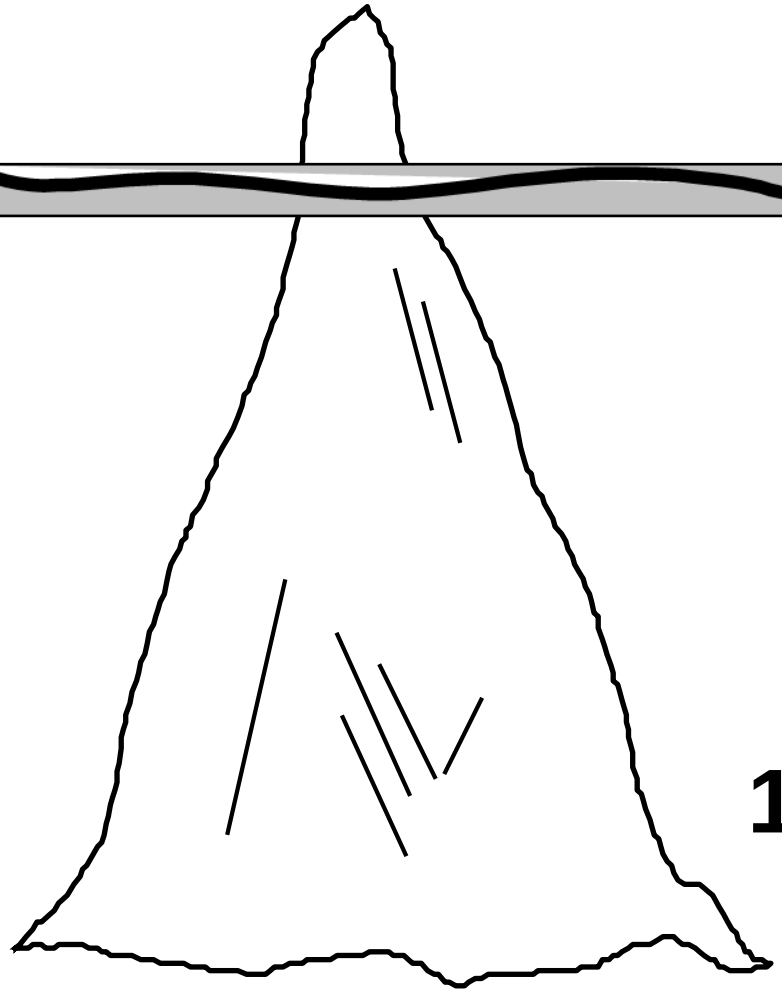
Learning: The company learns from mistakes. Staff are updated on safety issues by management.

Just: Employees know what is acceptable & unacceptable behavior.

Reporting: All personnel freely share critical safety information.

Example of Safety Promotion Related Hazard Video

What gets communicated upward?



4% Problems known to top management

9% Problems known to middle management

74% Problems known to supervisors

100% Problems known to rank and file MX personnel

Source: Yoshida, Shuichi, 2nd Intl Quality Symposium, 1989

5. Hazard Reporting
Proactive Processes

Looking Ahead

- System and task analysis of the operational (production) systems
- Proactive Hazard identification
- Updating:
  - Risk controls
  - Documentation
- Additional specialist training

Example of Safety Reporting Culture Video

REPORTING SYSTEM

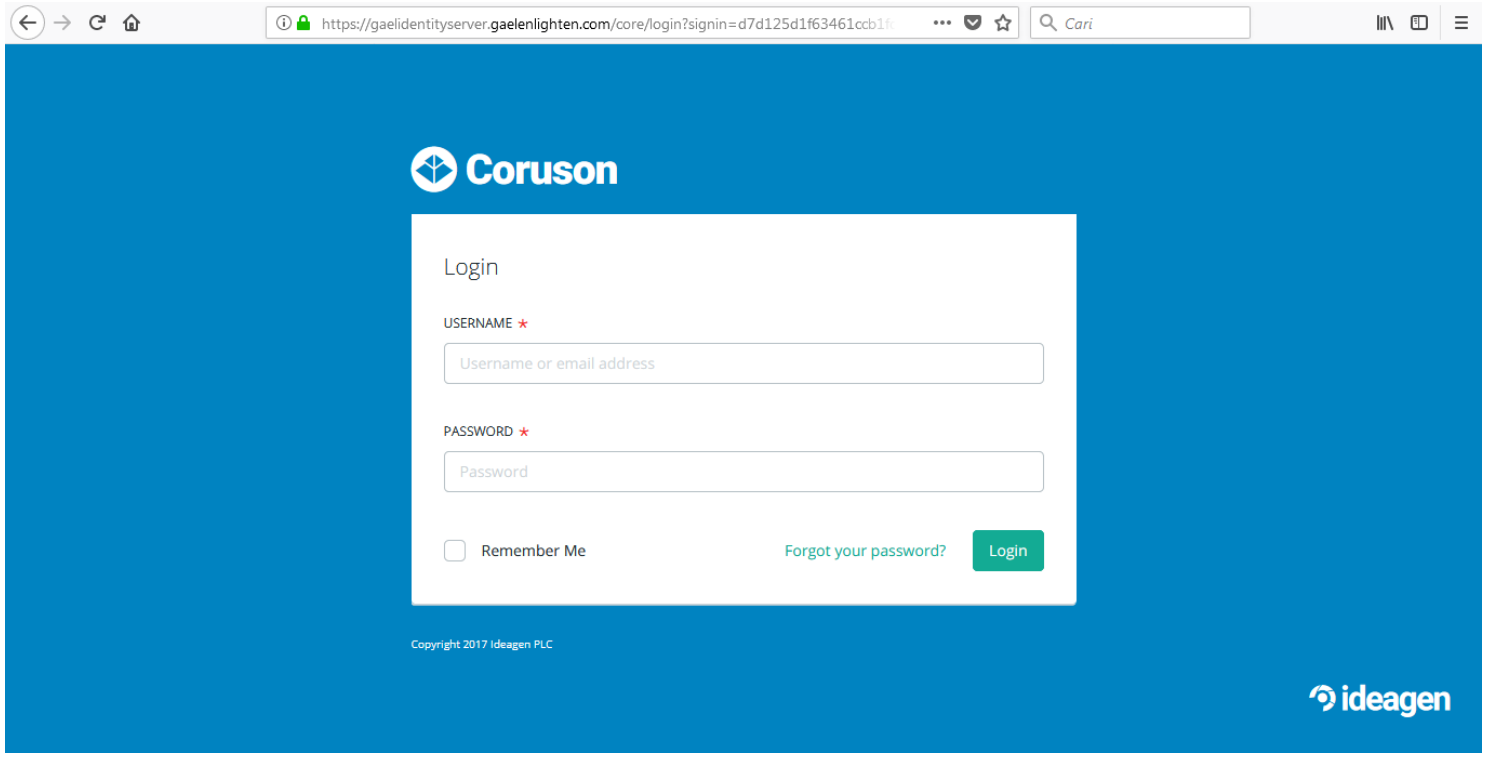
Coruson

Hosted on Amazon Web Services, Idegean Coruson has a scalable cloud architecture and can be extended without limit to user number and geographical distribution.

It allows **secure-confidential** reporting from aviation hazard and incident or accident reports. The report is filled directly through OSMS link which can be accessed through personal computer or gadget that integrated with internet connectivity.

➢ HOW TO INPUT REPORTS THROUGH WEBSITE

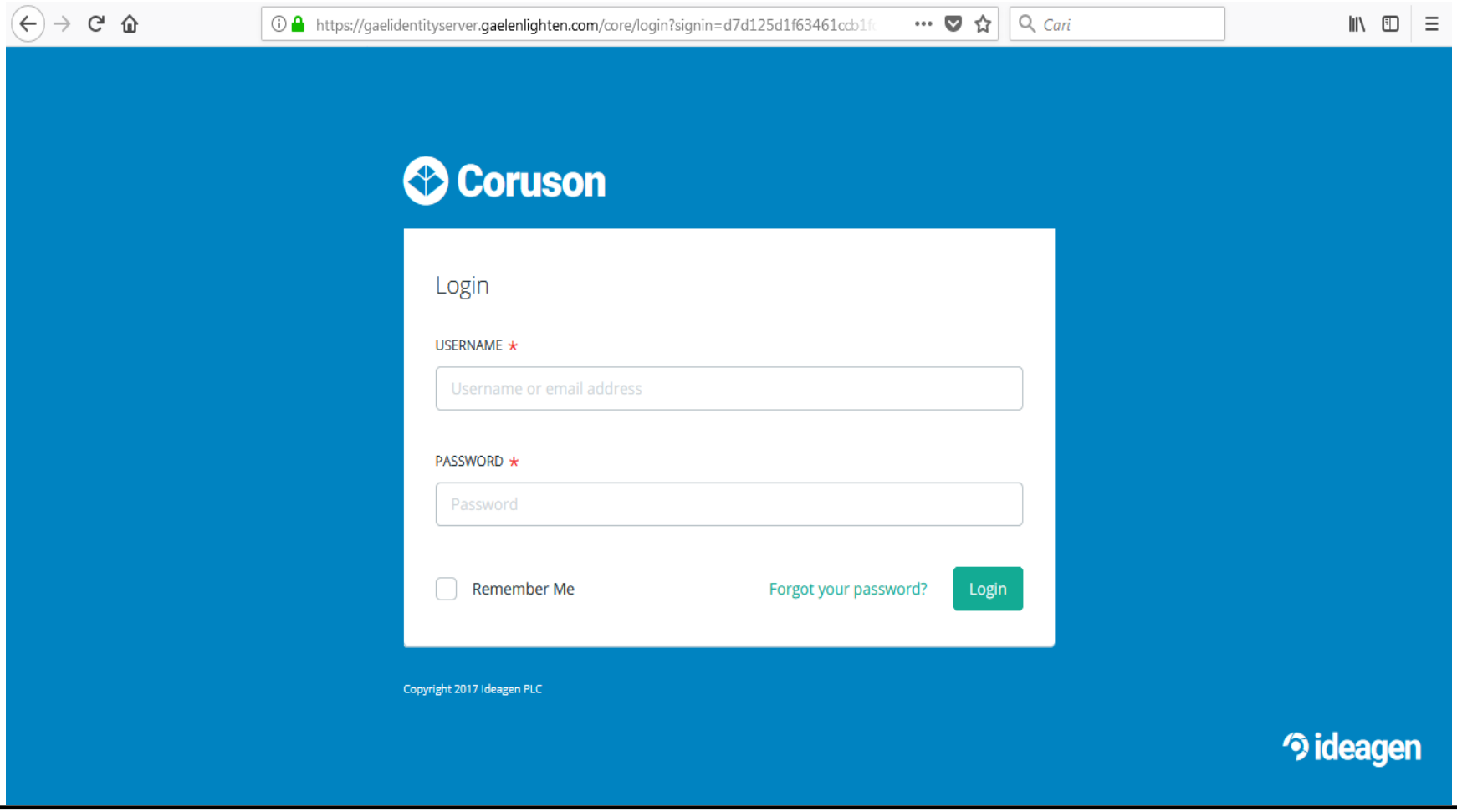
1. Open your browser
2. Type link as follows: http://lionairgroup.gaelenlighten.com



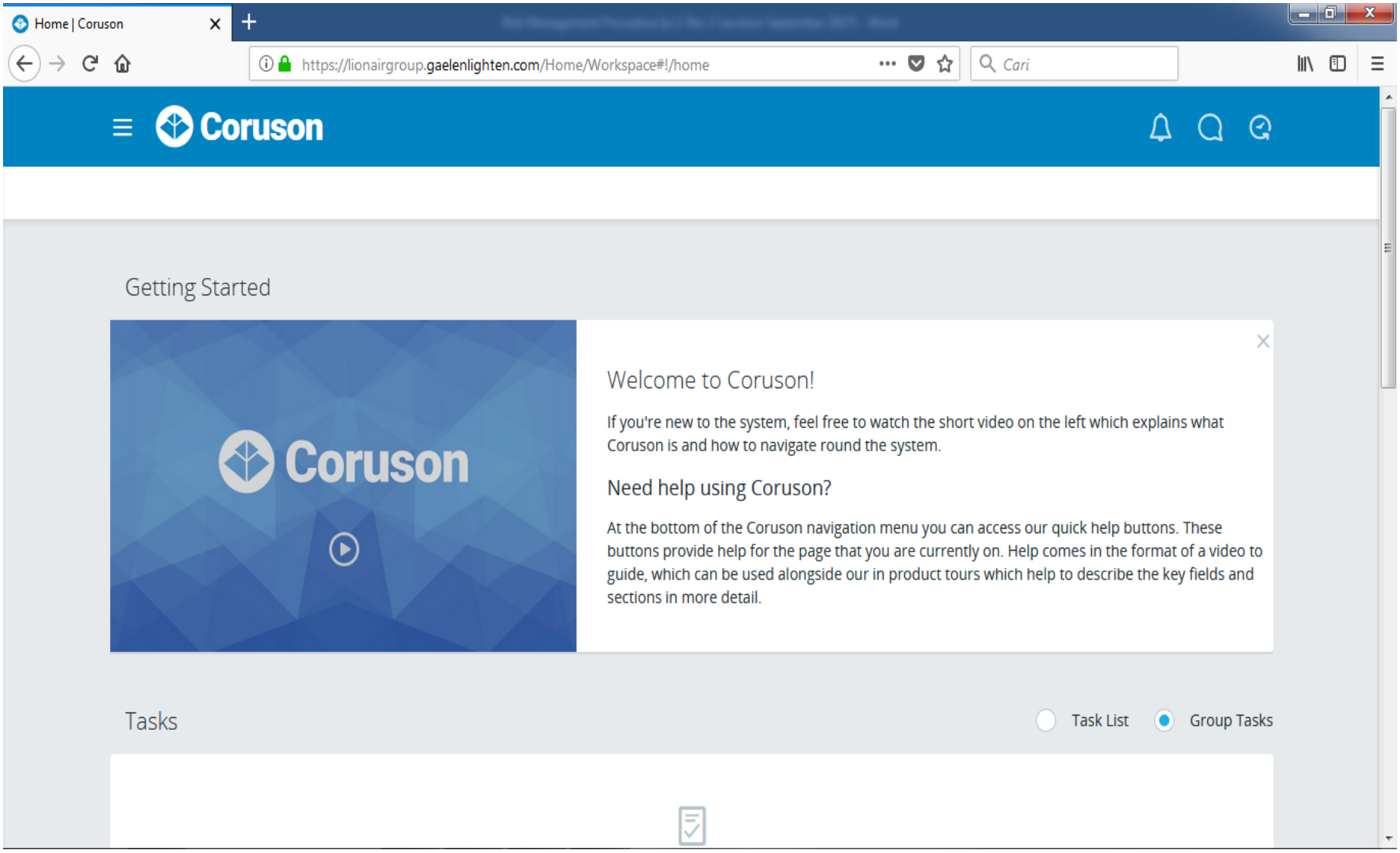
3. Input : username & password

jtfltops (Flight Crew)

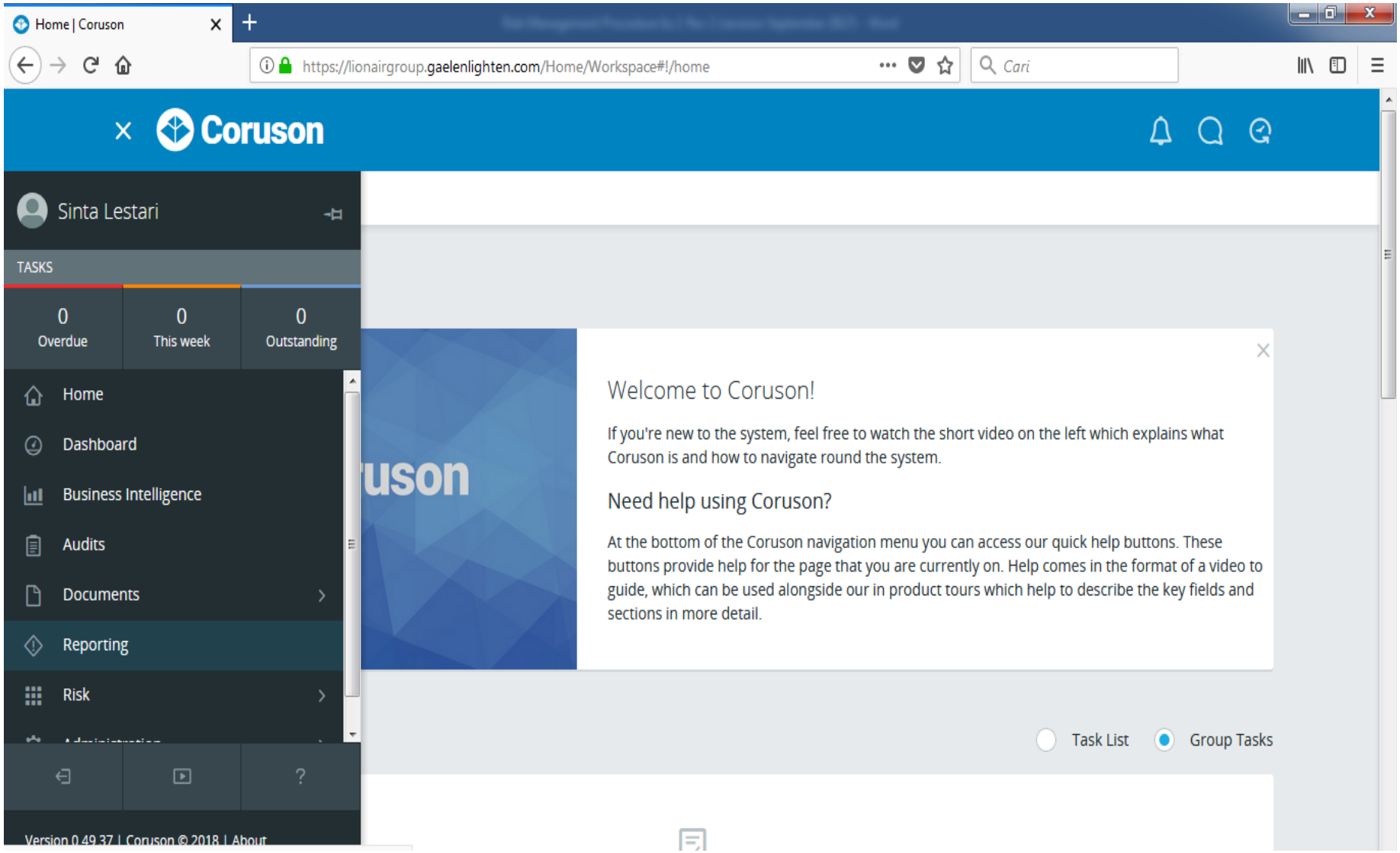
jtreporter (Non-Flight Crew)



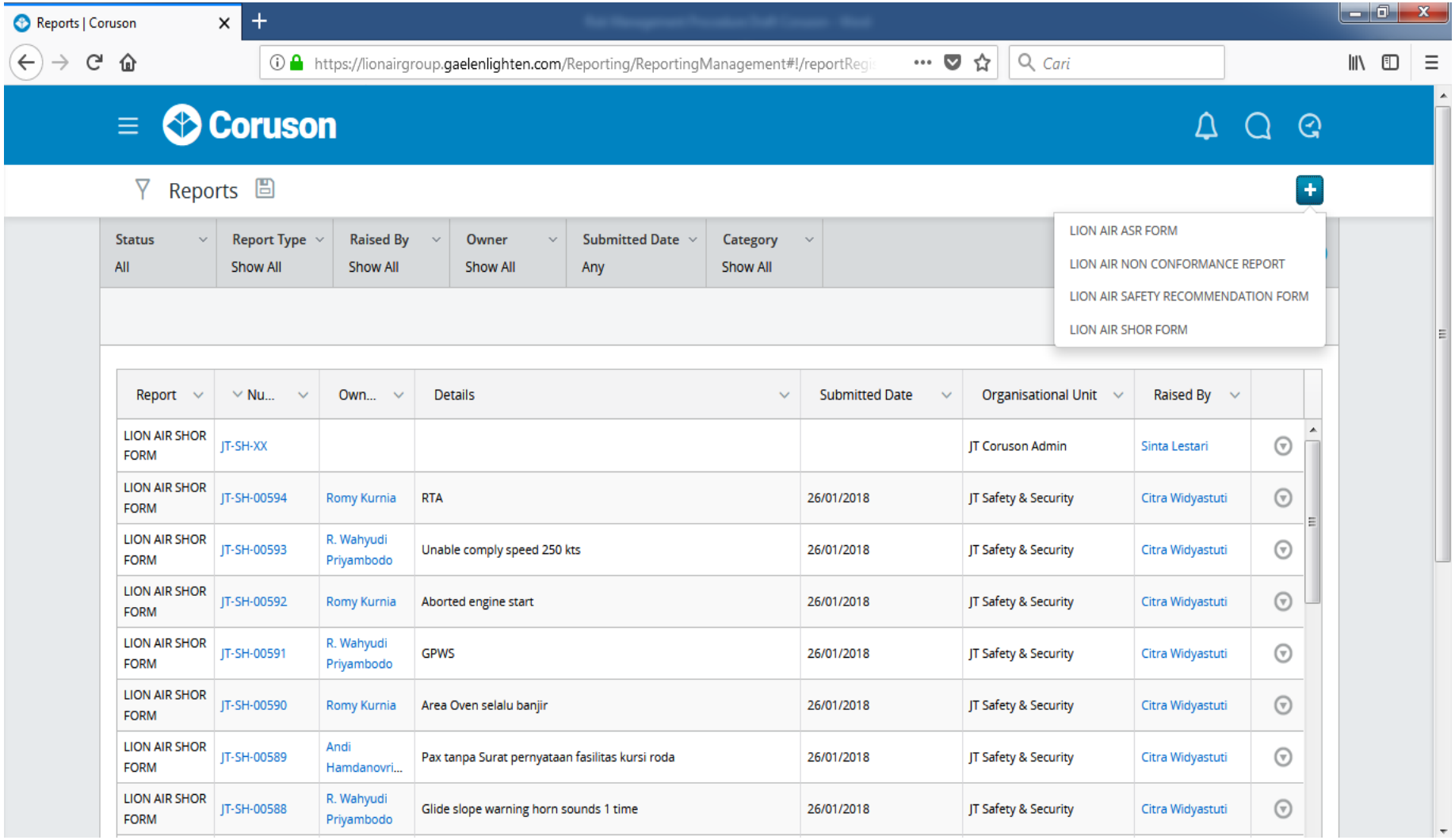
4. Click menu


Home | Coruson
https://lionairgroup.gaelenlighten.com/Home/Workspace#!/home
Cari
Coruson
Getting Started
Coruson
Welcome to Coruson!
If you're new to the system, feel free to watch the short video on the left which explains what Coruson is and how to navigate round the system.
Need help using Coruson?
At the bottom of the Coruson navigation menu you can access our quick help buttons. These buttons provide help for the page that you are currently on. Help comes in the format of a video to guide, which can be used alongside our in product tours which help to describe the key fields and sections in more detail.
Tasks
Task List
Group Tasks

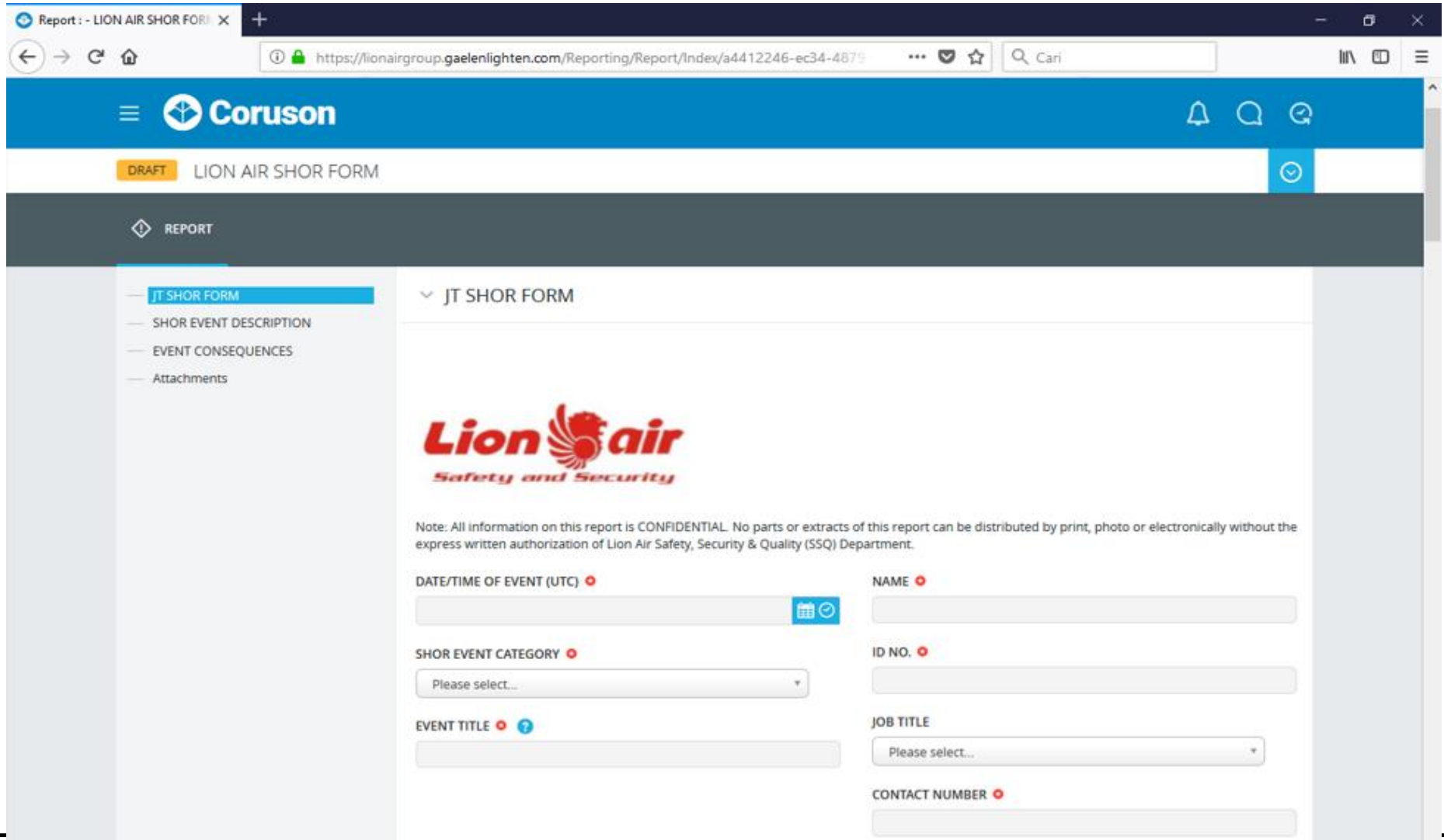
5. Chose reporting

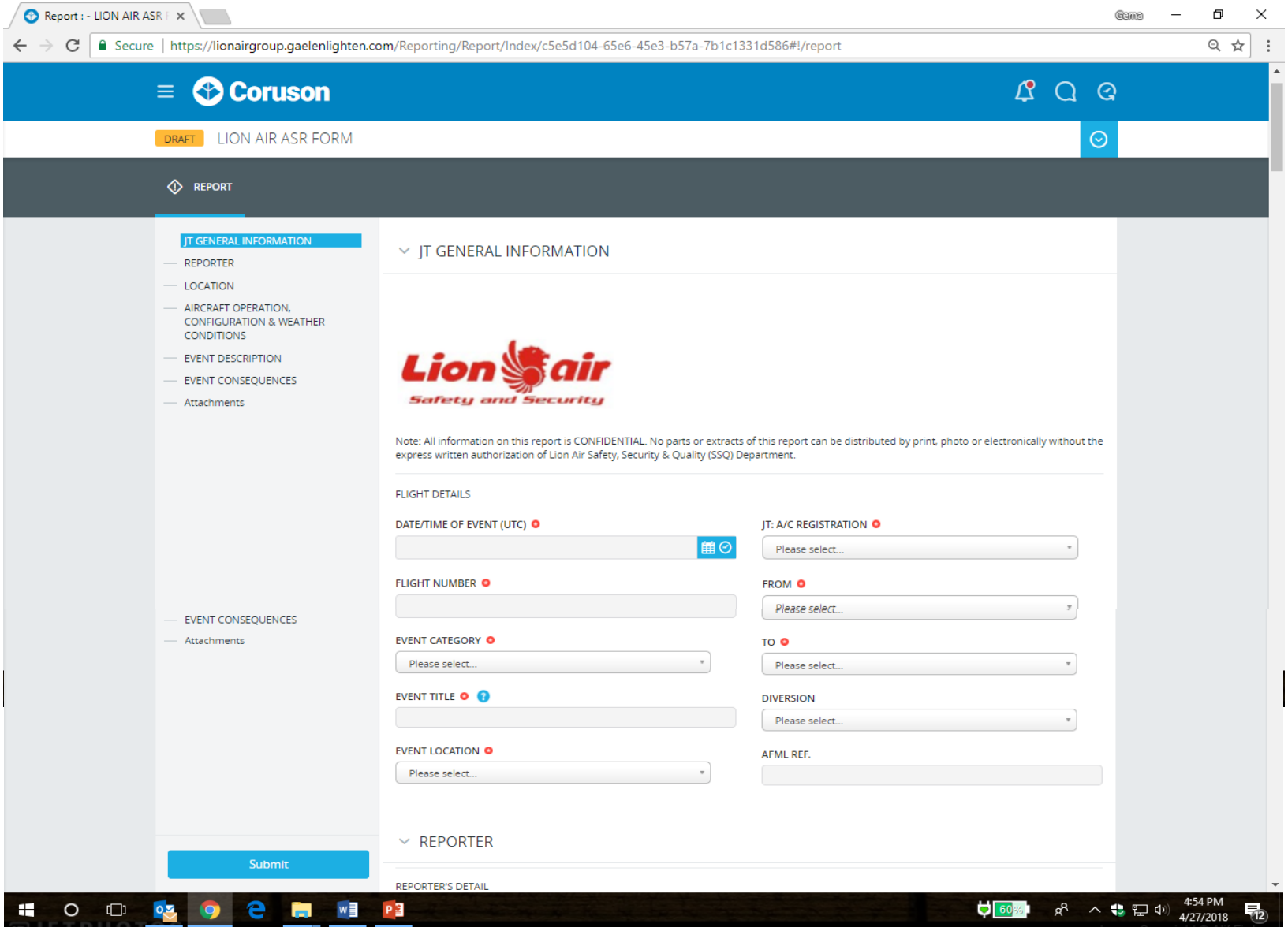


6. Click "PLUS" button and chose "ASR Form/SHOR Form" from 4 available categories.



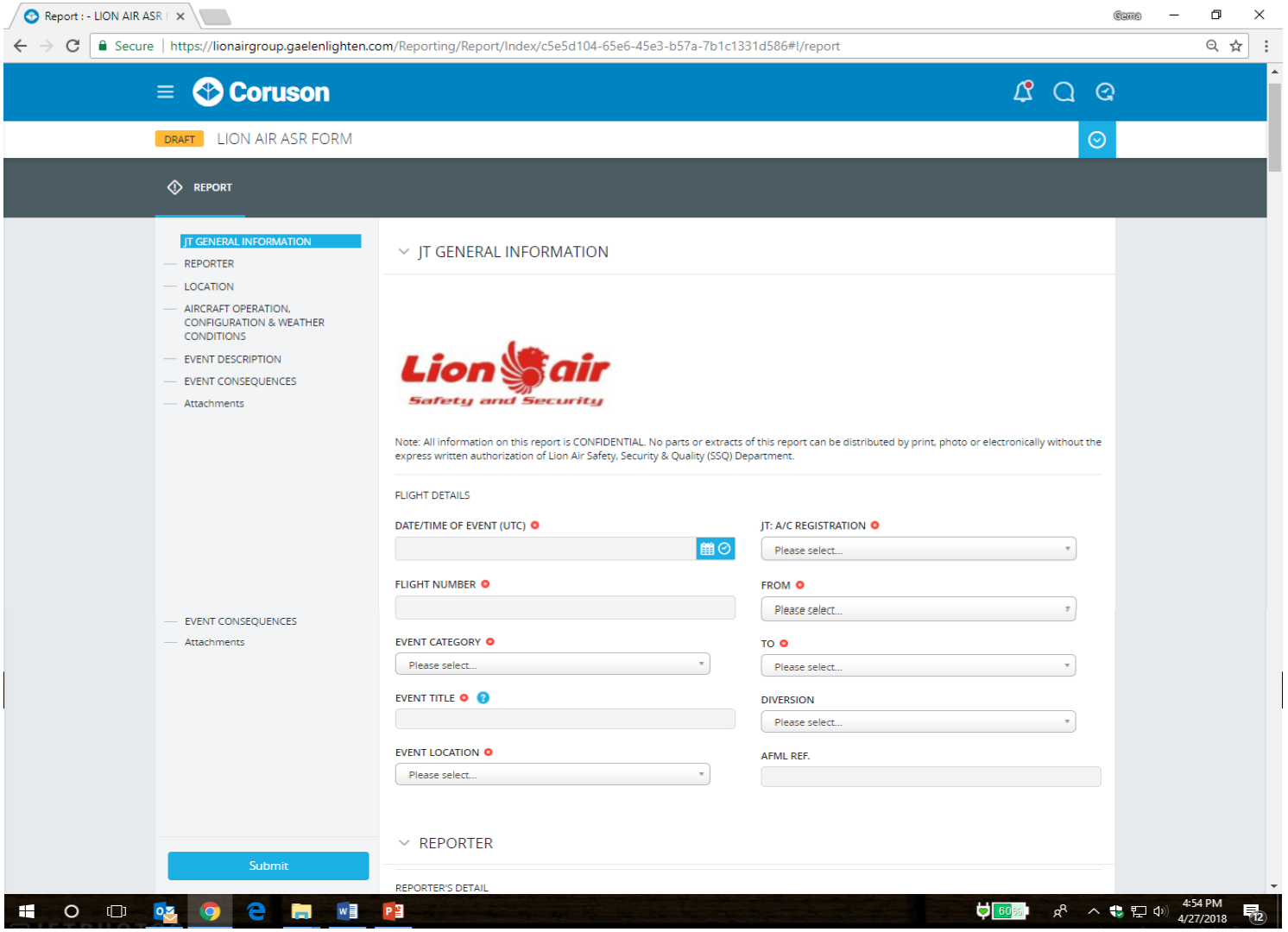
7. Complete all the required fields below and press the 'Submit' button if done.




Report : - LION AIR ASR
Secure
https://lionairgroup.gaelenlighten.com/Reporting/Report/Index/c5e5d104-65e6-45e3-b57a-7b1c1331d586#!/report
Coruson
DRAFT
LION AIR ASR FORM
REPORT
JT GENERAL INFORMATION
REPORTER
LOCATION
AIRCRAFT OPERATION, CONFIGURATION & WEATHER CONDITIONS
EVENT DESCRIPTION
EVENT CONSEQUENCES
Attachments
EVENT CONSEQUENCES
Attachments
Submit
JT GENERAL INFORMATION
Lion air
Safety and Security
Note: All information on this report is CONFIDENTIAL. No parts or extracts of this report can be distributed by print, photo or electronically without the express written authorization of Lion Air Safety, Security & Quality (SSQ) Department.
FLIGHT DETAILS
DATE/TIME OF EVENT (UTC)
JT: A/C REGISTRATION
Please select...
FLIGHT NUMBER
FROM
Please select...
EVENT CATEGORY
TO
Please select...
EVENT TITLE
DIVERSION
Please select...
EVENT LOCATION
AFML REF.
Please select...
REPORTER
REPORTER'S DETAIL
4:54 PM
4/27/2018

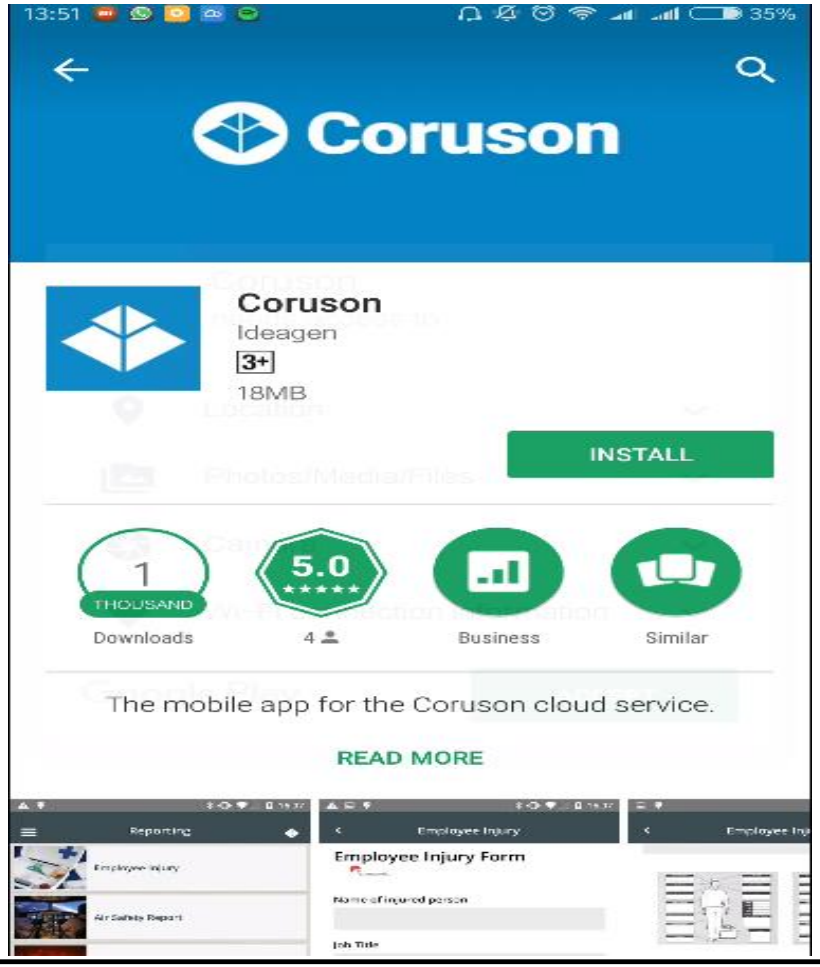
CORUSON

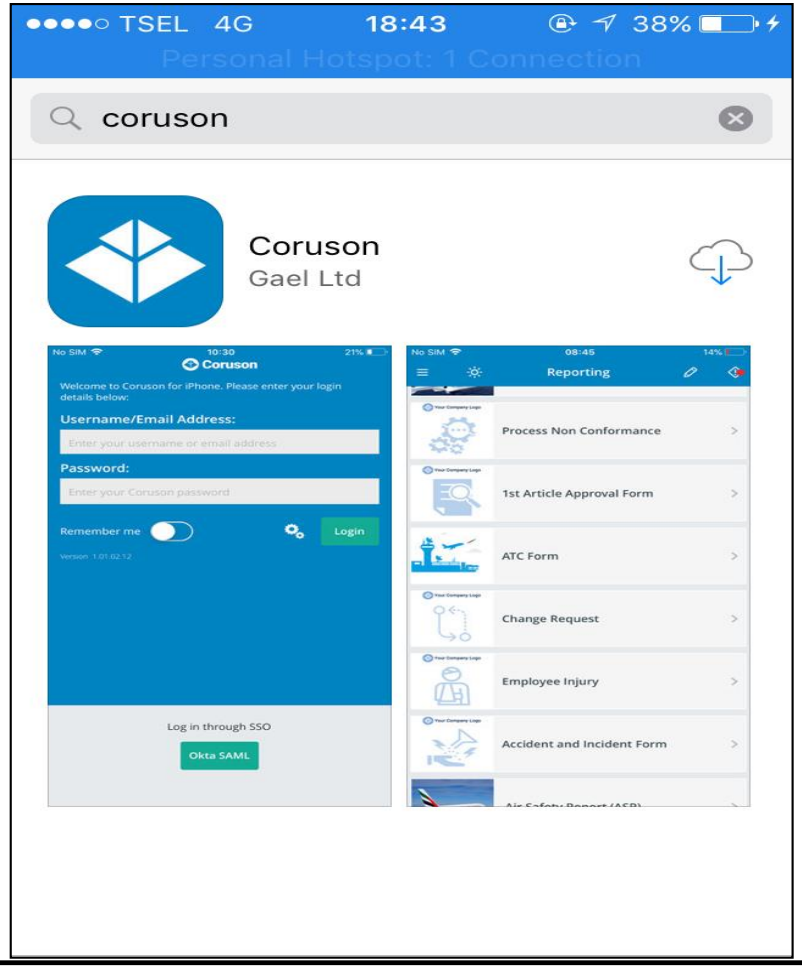
8. Complete all the required fields below and press the 'Submit' button if done.



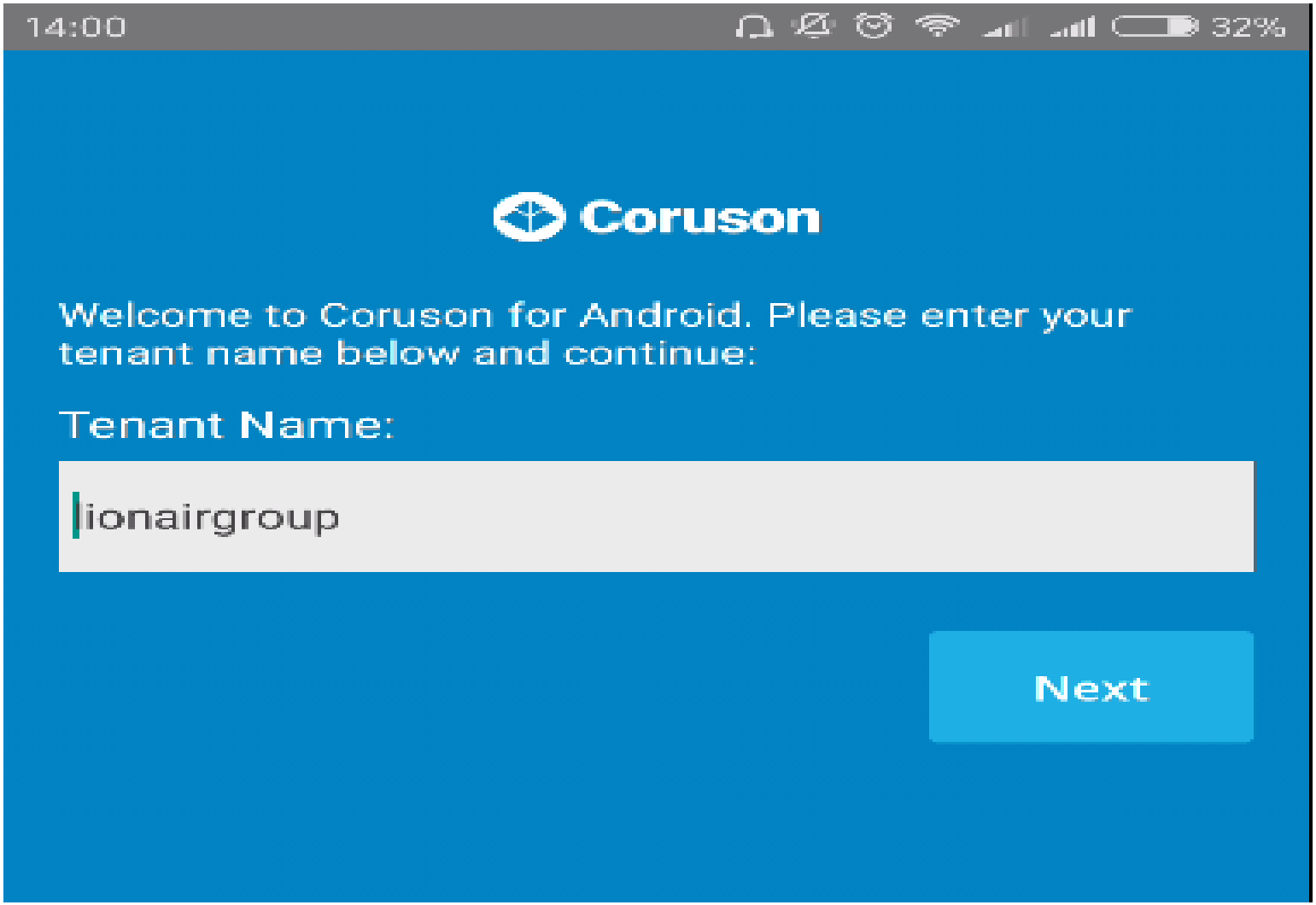
➢ HOW TO INPUT REPORTS THROUGH MOBILE APPS

1. Open Playstore or Appstore application in your mobile phone and install **CORUSON**

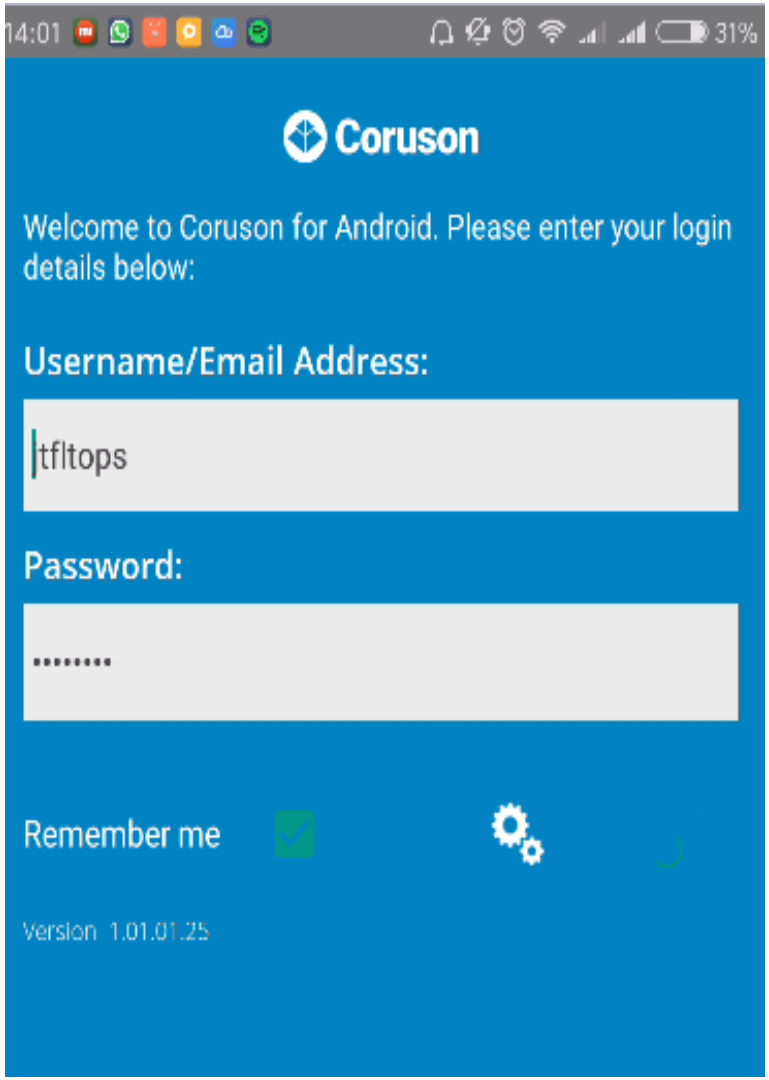




2. Open CORUSON application and type " **lionairgroup** " in **tenant name column**

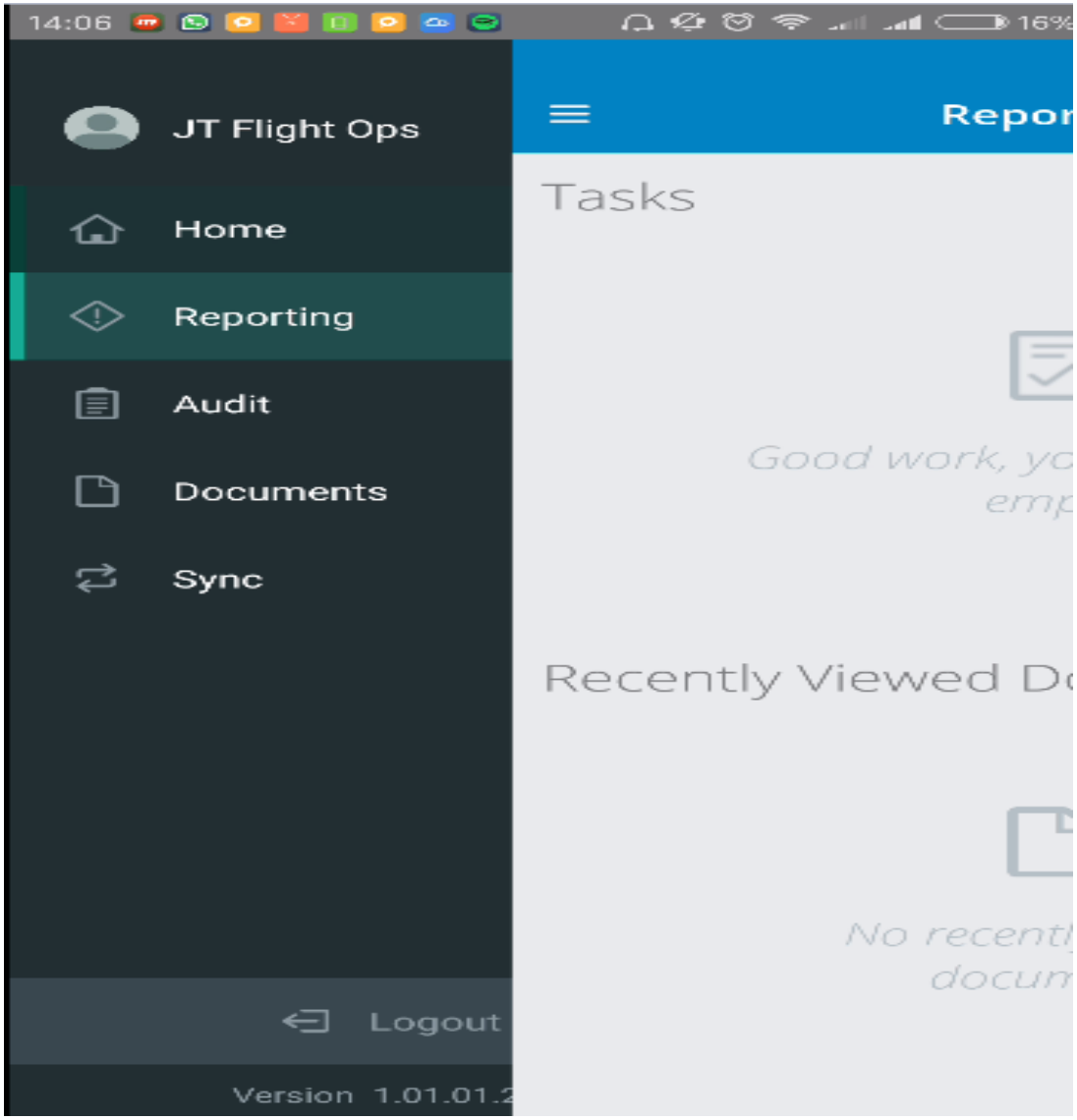


3. Insert Username and password available in column

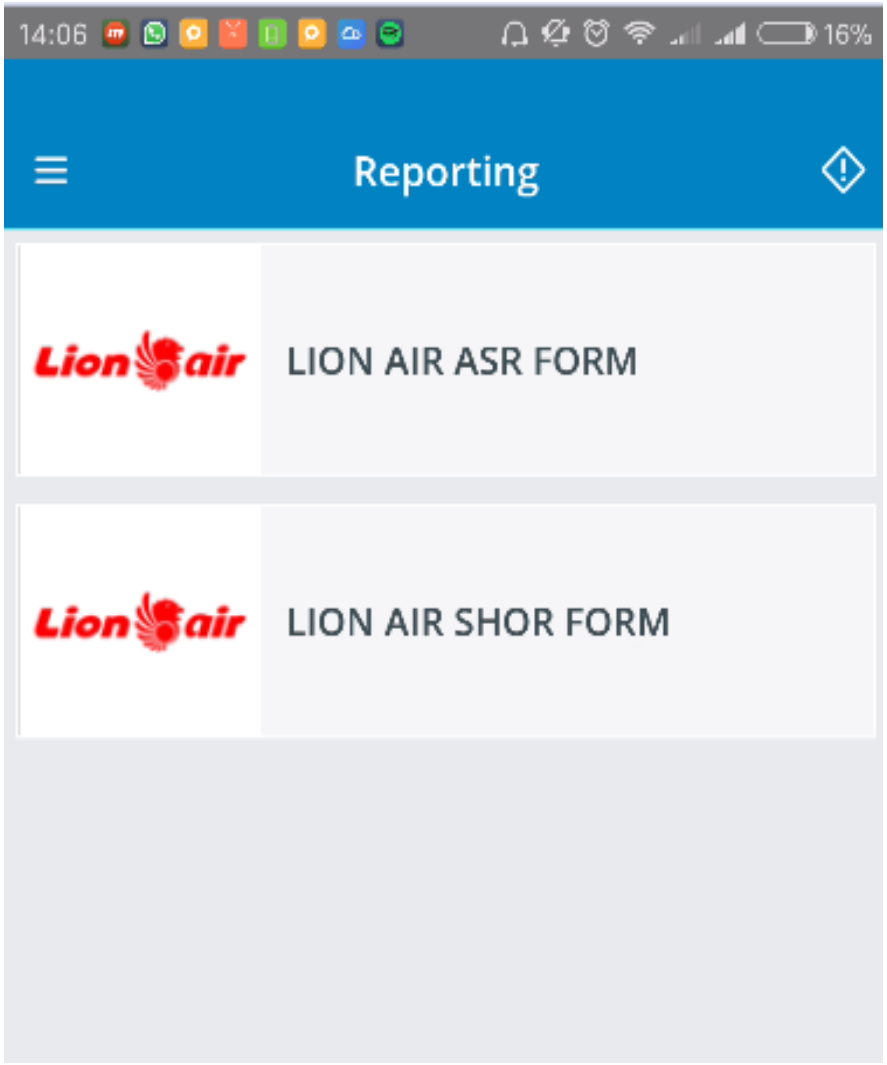


Reporter	Username	Password
Flight Crew	jtfltops	jtfltops
Non-Flight Crew	jtreporter	jtreporter

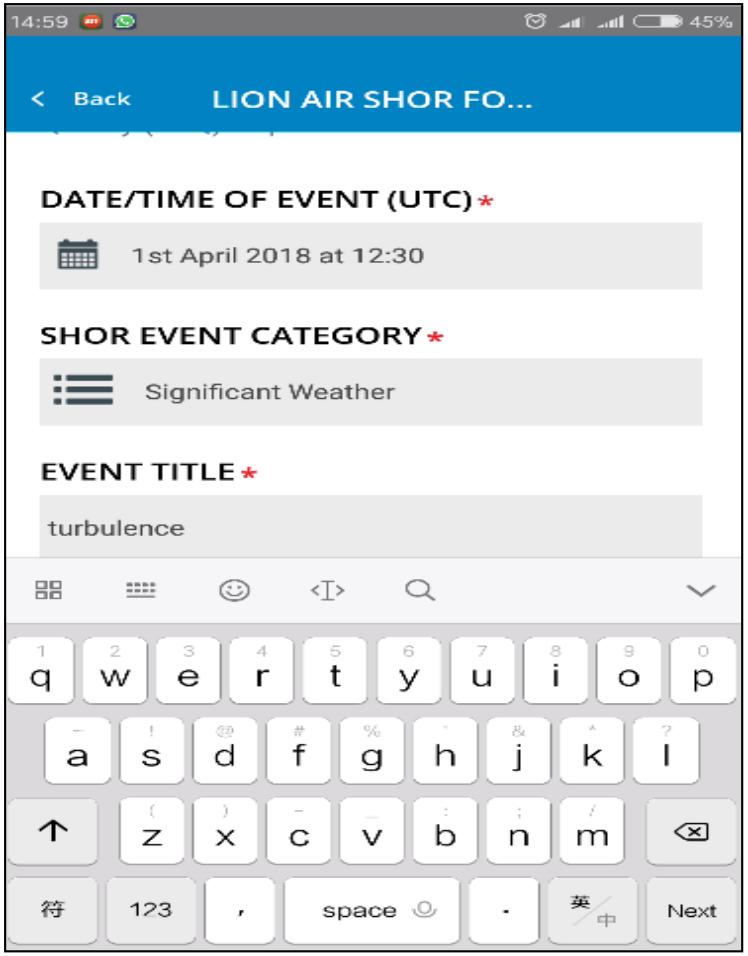
4. Choose reporting category to submit report

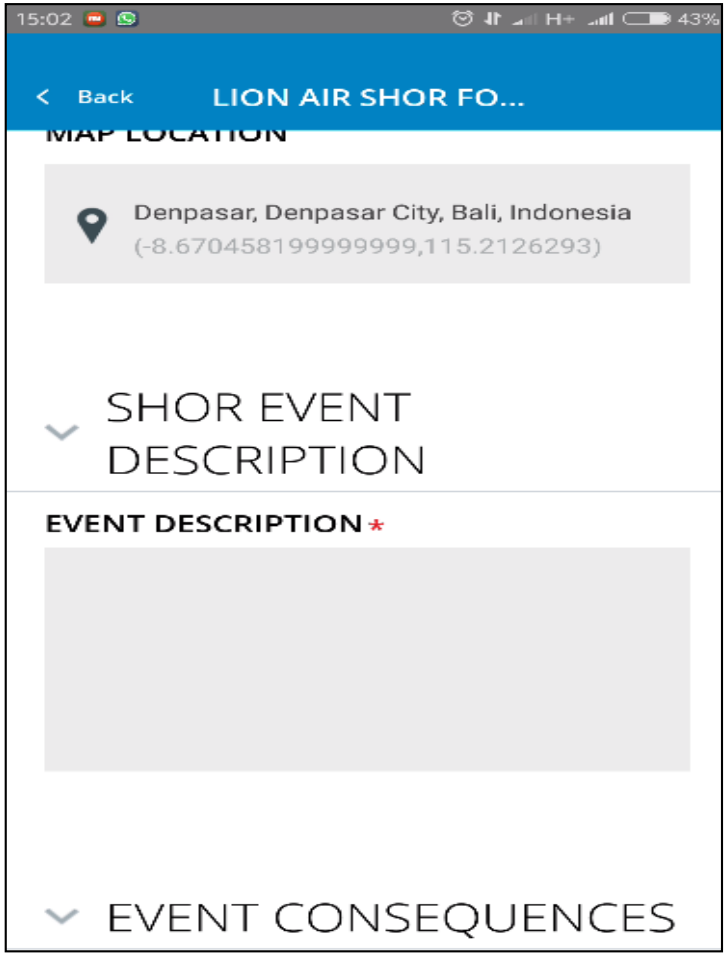


5. Choose either SHOR or ASIR form to submit report

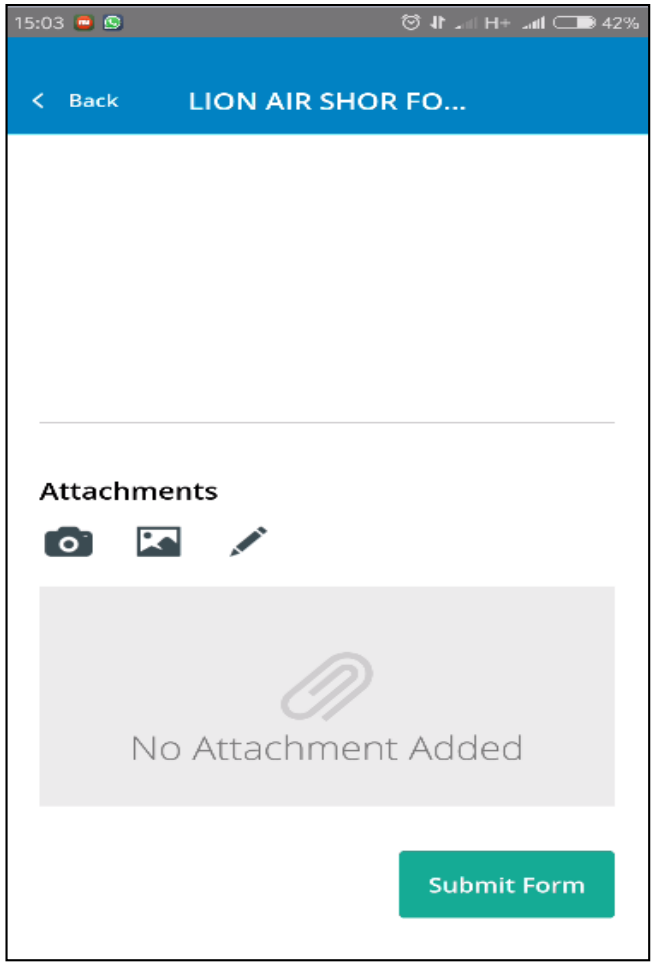


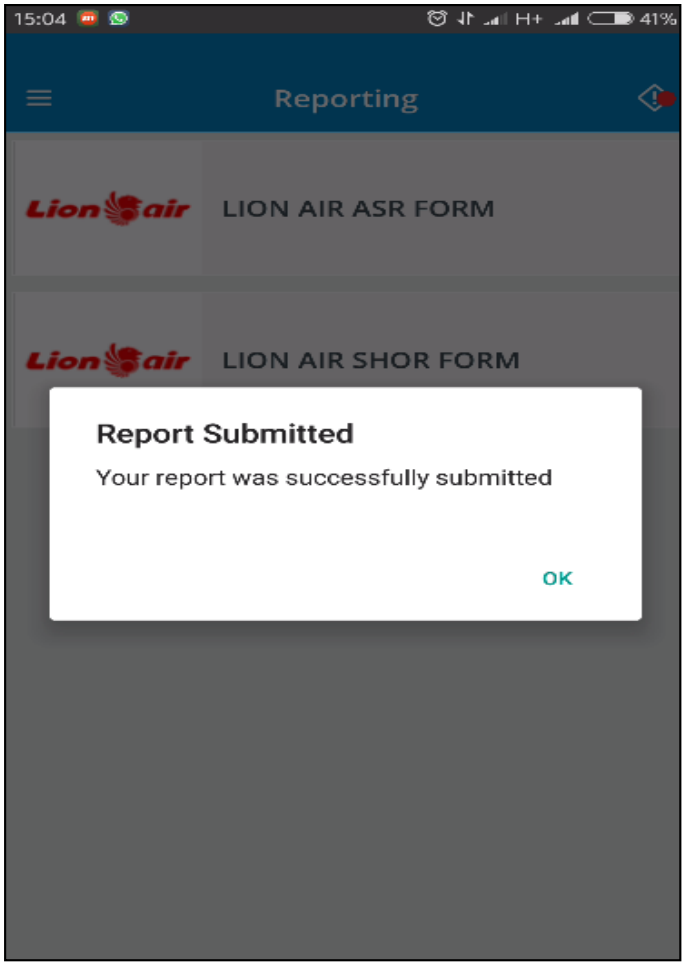
6. Fill event or hazard information in each column (sign * must be filled)



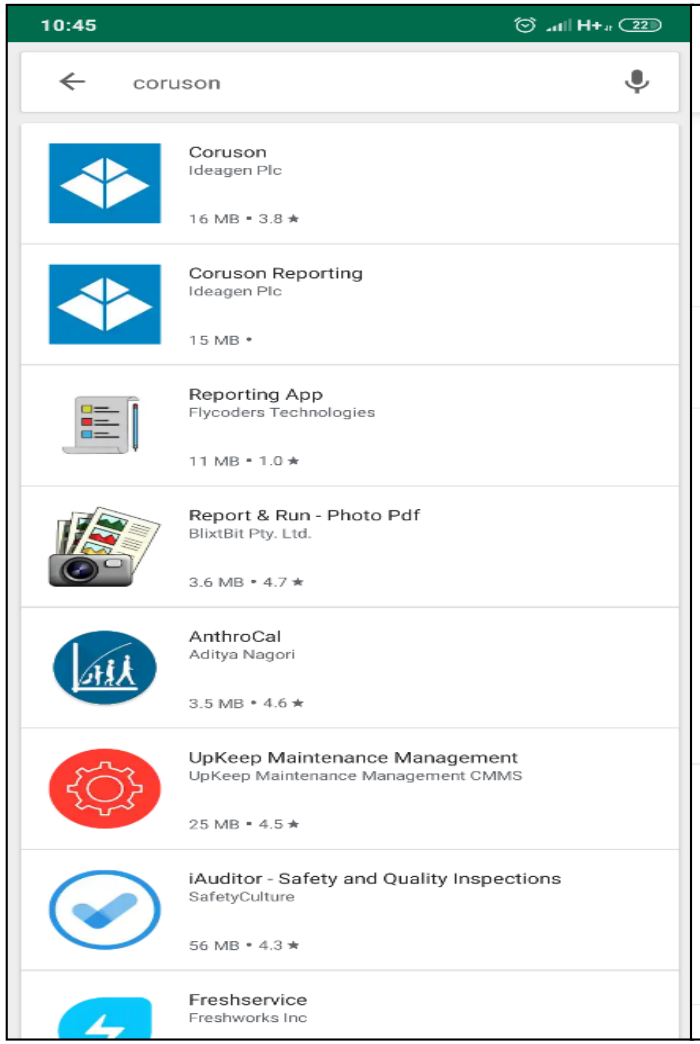


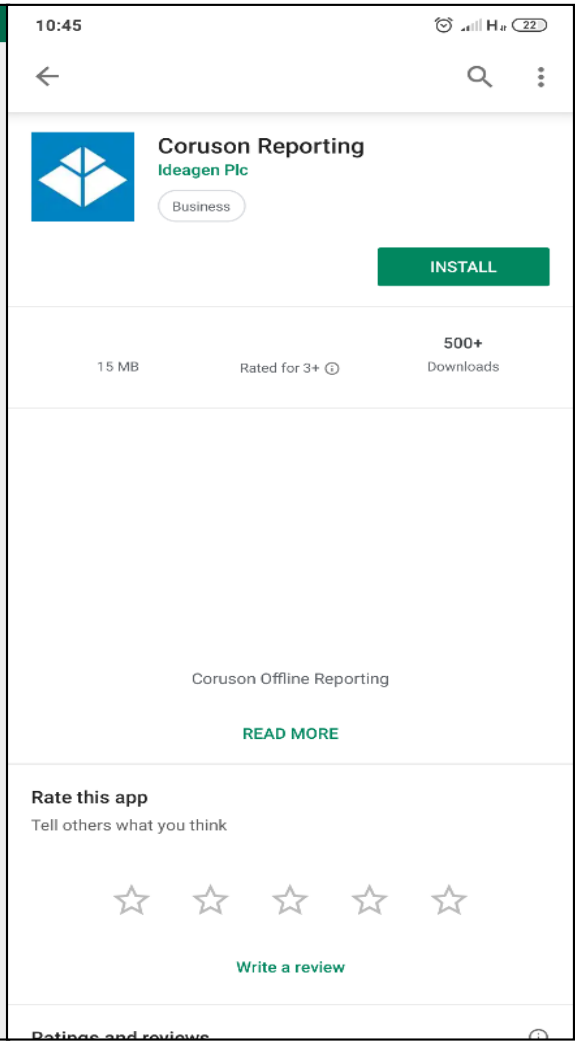
7. Click submit report button to upload your report into CORUSON system.

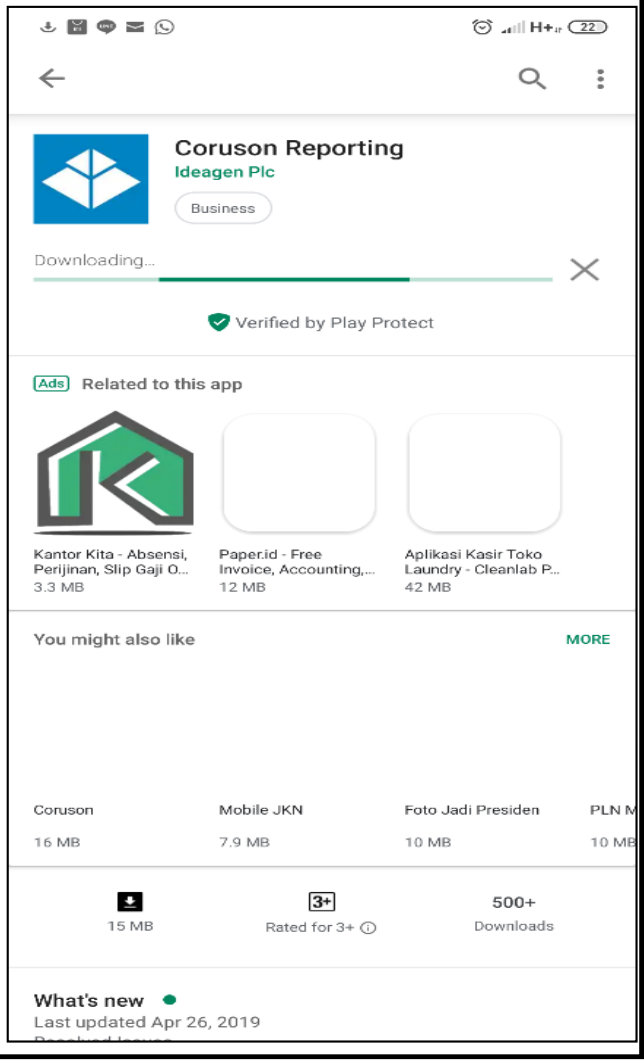




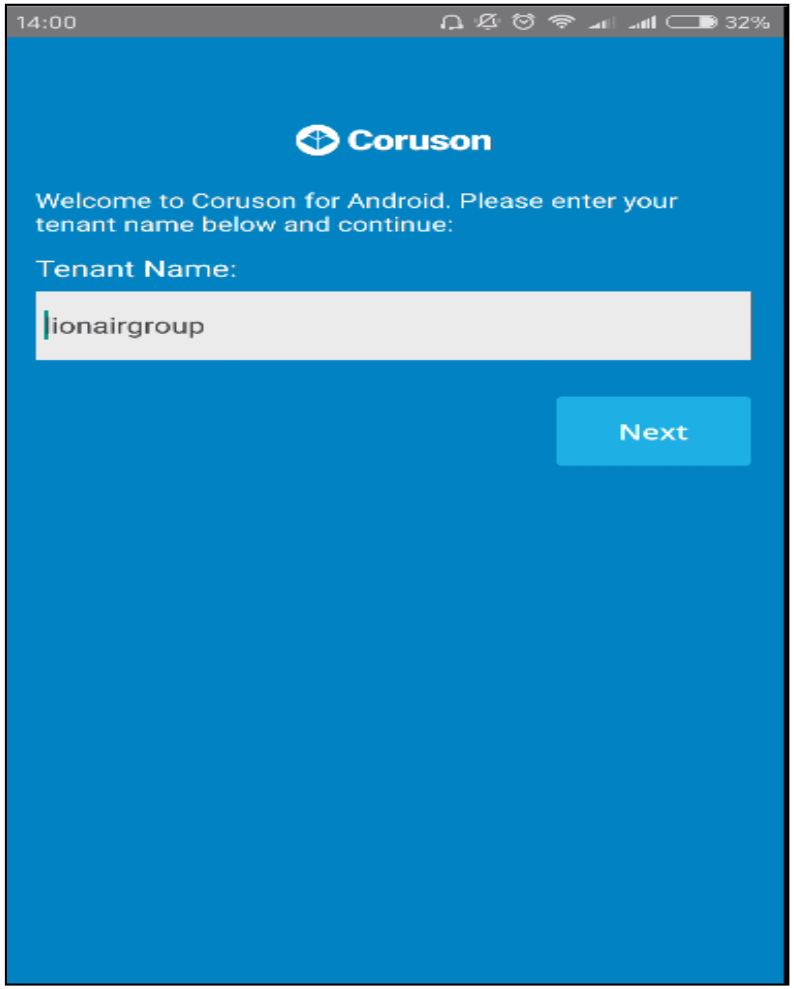
1. Open Playstore or Appstore application in your mobile phone and install **CORUSON Reporting :**



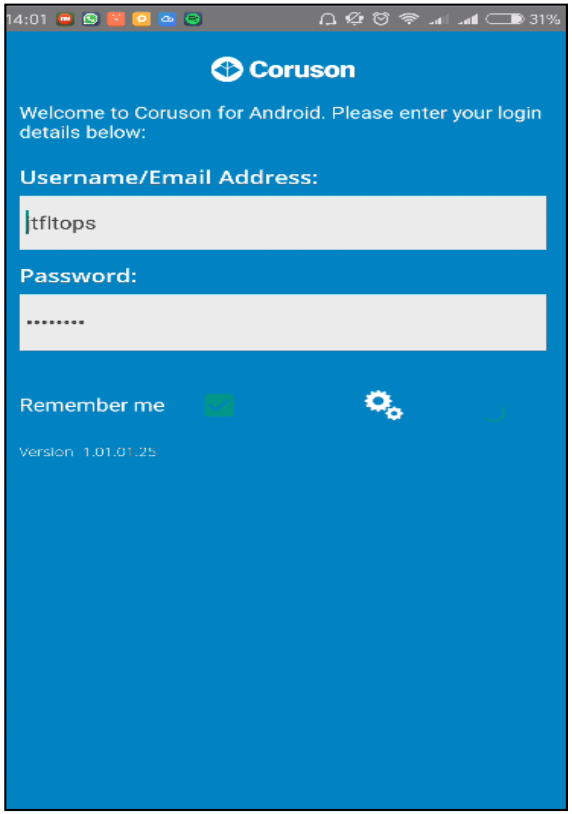




2. Open CORUSON application and type **lionairgroup** in **tenant name column :**

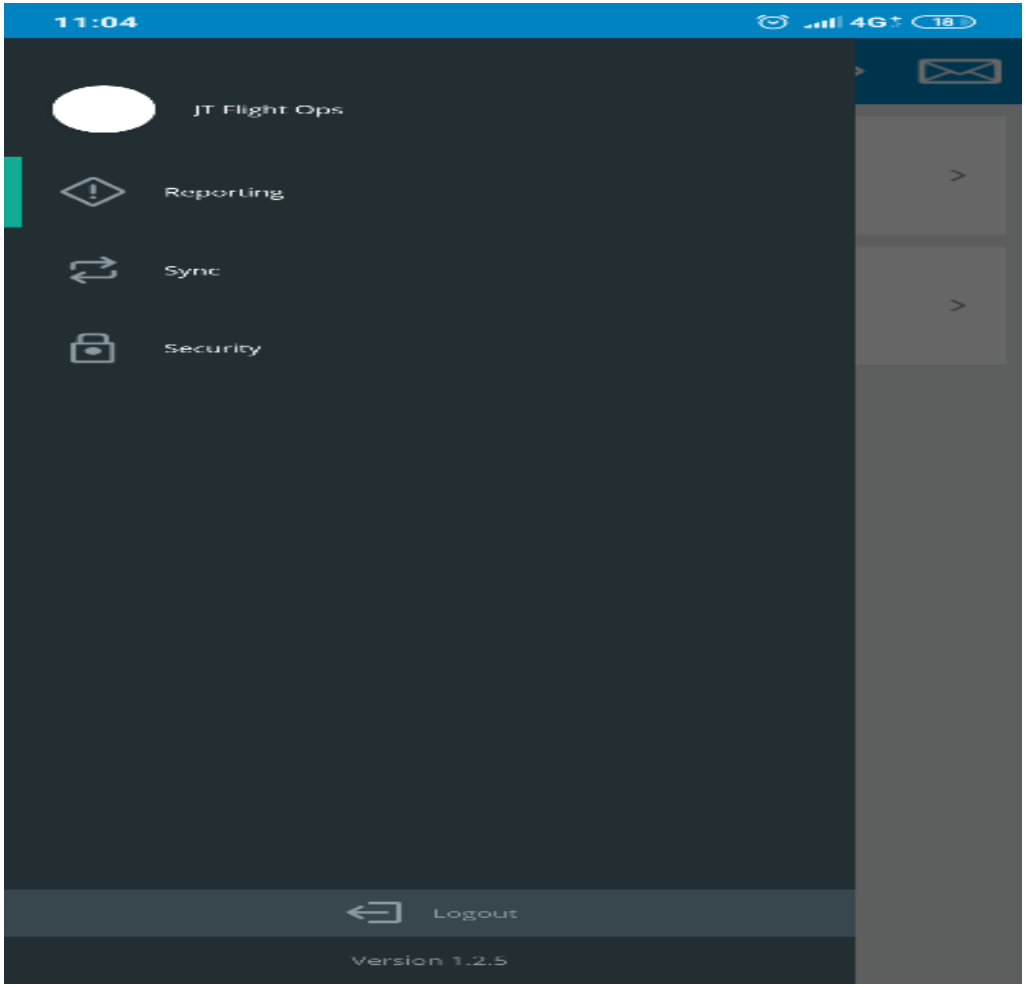


3. Insert **username and password** available in column :

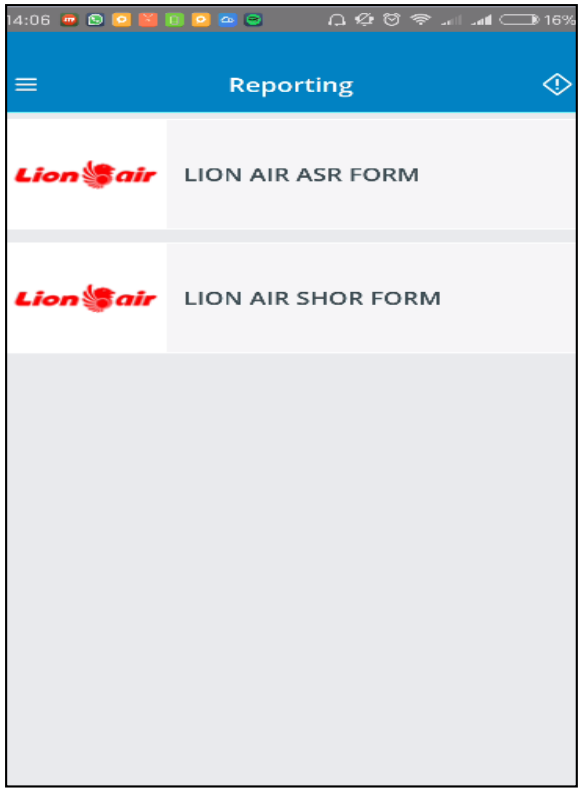


Reporter	Username	Password
Flight Crew	jtfltops	jtfltops
Non-Flight Crew	jtreporter	jtreporter

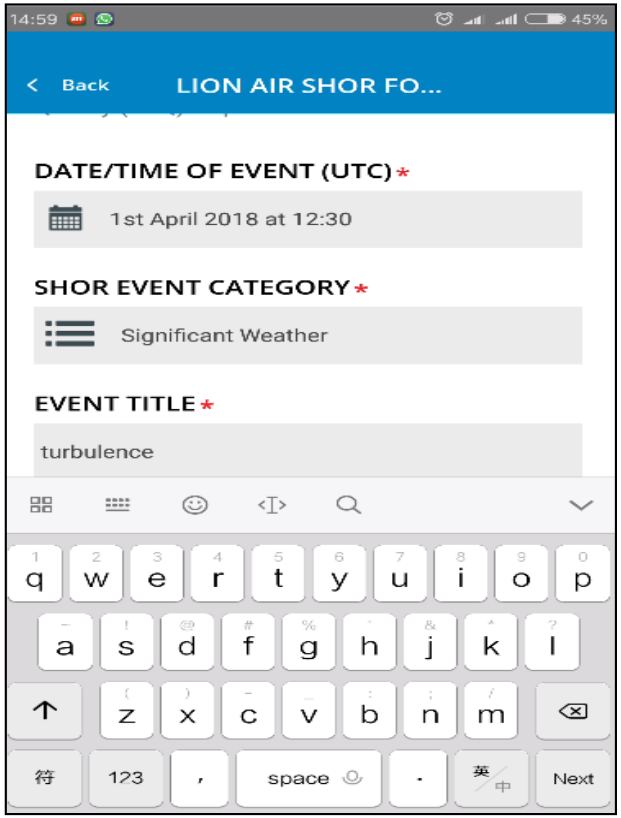
4. Choose **reporting category** to submit report :

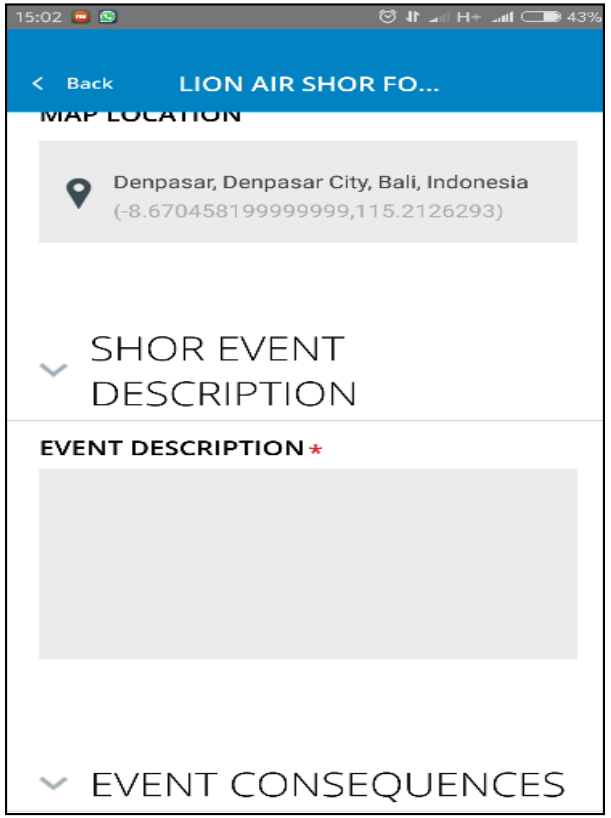


5. Choose either **SHOR or ASIR** form to submit report :

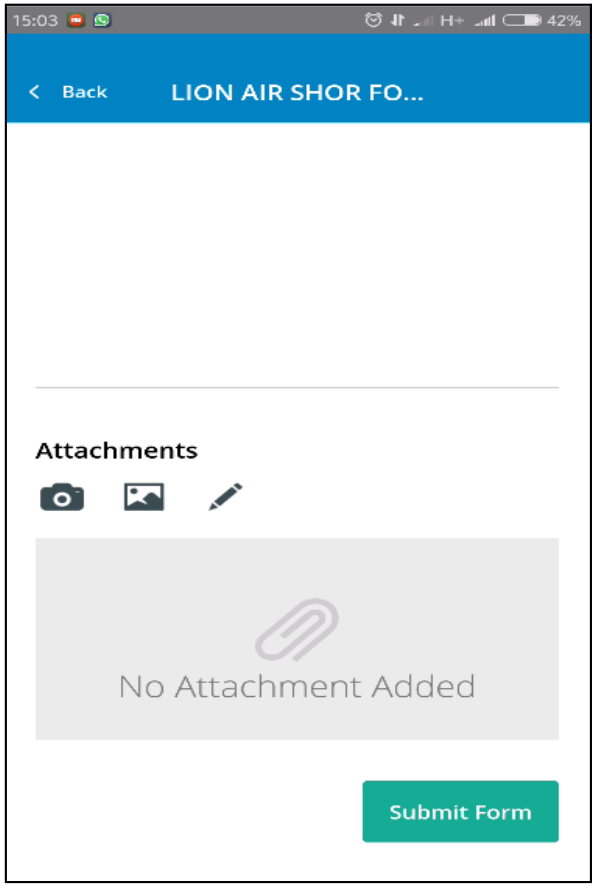


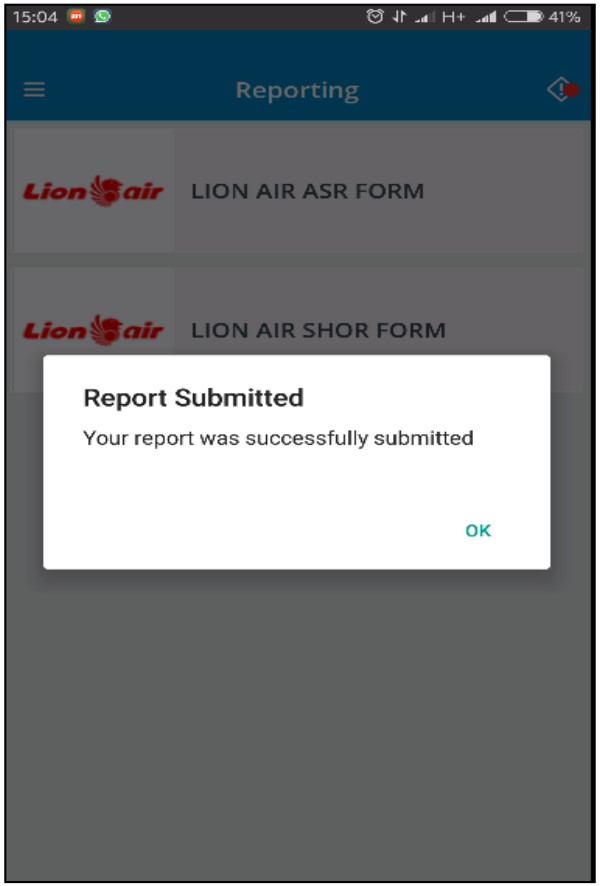
6. Fill events or **hazard information** in each column (Sign * must be filled)





7. Click **submit report** button to upload your report into **CORUSON** reporting system.





Hazard Identification – Exercise & Case Study

Activity :

1. After completion of SMS theory and implementation, every student will go to carry out exercise & case study in hazard identification & reporting system activities.
2. Hazard Identification and reporting system activities may be conducted in combination of classroom and field trip activities.
3. Every student is assigned to find minimum 1 Hazard Identification in their environment.
4. If possible, the hazard identification found by 1 student is different with another student.

Hazard Identification – Exercise & Case Study

Activity :

5. Please include the minimum information below for respective hazard identification :
   - Title of Report
   - Date of Occurrence
   - Time of Occurrence
   - Location of Occurrence
   - Reported By
   - Confidential ? Yes / No
   - Description of Report

Hazard Identification – Exercise & Case Study

Activity :

6. Hazard identifications activities are executed and recorded using Hazard Identification Form.

7. All hazard identification found will be followed up with reporting activity using applicable procedures.

8. Reporting activity will be carried out upon completion of hazard identification activity.

THANK YOU