



HUMAN FACTORS WEBINAR

JANUARY 12, 2022

LED BY HUMAN FACTORS SMIG

“SUBJECT MATTER INTEREST GROUP”

AGENDA

- **INTRODUCTION :**
- *PRESENTATION SMIG GROUP AND AS13100 REQUIREMENTS*
- **Zoom on Policy and leadership**
- **Example of Policy**
- **Example Leadership**
- **Example of Communication within the company**
- **HF in 8D and Interview**
- **Communication at GE**
- **Deployment at suppliers**
- **Example of Deployment at AIRBUS' supplier**
- *Safran NACELLES*
- **Q and A session**

Catherine CATARINA Safran

Nicholas WATLING P & W

Chris CRAIG Rolls-Royce

Beata TARCZON MTU

Richard BOLINGBROKE PCC

Yusufali MADARBUKUS Safran

Brandon RICHARDS GE

Catherine CATARINA Safran

Ludovic CHEVET AIRBUS

ALL

AS13100 & Reference Manuals Now Published



Introducing AS13100: AESQ Quality Management Requirements

THE NEW STANDARD CREATING A COMMON LANGUAGE FOR QUALITY THROUGHOUT THE AEROSPACE ENGINE SUPPLY CHAIN

SAE AS13100 AESQ QUALITY MANAGEMENT SYSTEM REQUIREMENTS FOR AERO ENGINE DESIGN AND PRODUCTION ORGANIZATIONS

This standard sets out to create a common set of supplemental requirements with common training and reference manuals to improve understanding, efficiency, and performance. While significantly simplifying the businesses of suppliers with multiple customers, the primary intent of this new standard is to improve overall product quality by focusing on the key systems and processes currently deterring consistent aerospace engine product quality.

These common supplemental requirements aim to raise the bar for anticipated performance in these key areas, and therefore detailed guidance is provided to ensure clarity of expectations.

To assure customer satisfaction, the aviation, space, and defense industry organizations have to produce and continually improve safe, reliable products that equal or exceed customer and regulatory authority requirements. The globalization of the industry and the resulting diversity of regional/national requirements and expectations have complicated this objective. End-product organizations face the challenge of assuring the quality of and integration of product purchased from suppliers throughout the world and at all levels within the supply chain. Industry suppliers face the challenge of delivering product to multiple customers having varying quality expectations and requirements.

Learn more:
www.sae.org/standards/content/AS13100/



Learn about how SAE AS13100 AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations minimizes requirements and improves overall product quality by focusing on the key quality systems and processes! Through an executive overview and a self-paced course, your organization can gain key knowledge about a common quality language, how to gain compliance to AS13100 and the business value and benefit of the standard. Walk-through each section of the standard and understand the new requirements.

For more information, please visit:
discover.sae.org/AS13100



TESTIMONIAL

"Although created by the Aero Engine Supplier Quality Group in conjunction with the SAE G-22 Aero Engine Supplier Quality Standards Committee, this standard and supporting materials will benefit any organisation, in any industry."

Dr. Ian Riggs
Global Quality Executive
Rolls-Royce & AESQ Chair



**AVAILABLE
FROM THE
AESQ
WEBSITE**

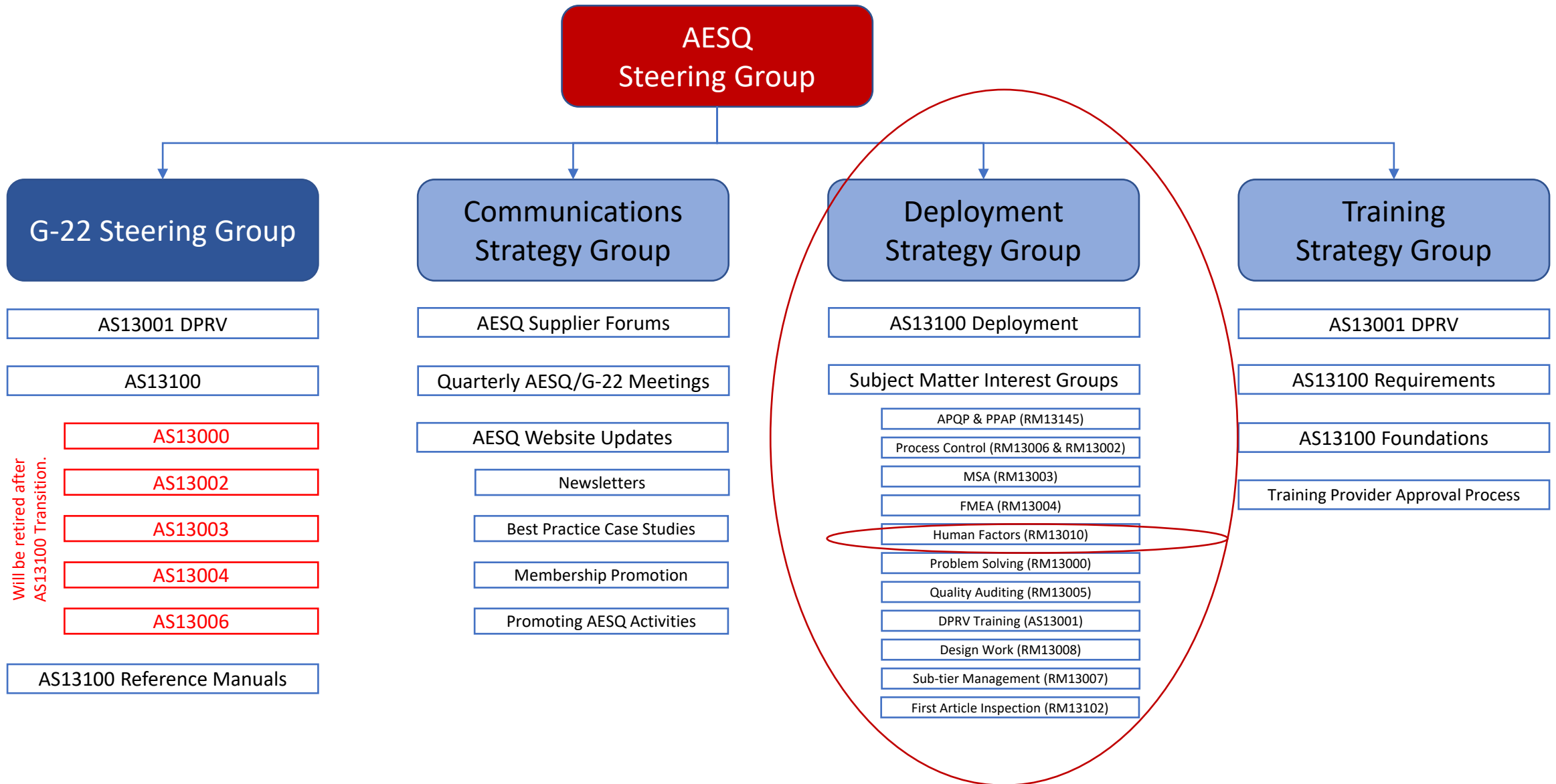
AESQ – Aerospace Engine Supplier Quality Strategy Group

This document slide does not contain ITAR or EAR technical data. The content of this presentation slide is proprietary and confidential information of the AESQ. It is not permitted to be distributed to any third party without the written consent of the AESQ.



HOW does it work?

AESQ Strategic Themes: HF SMIG part of deployment Strategy

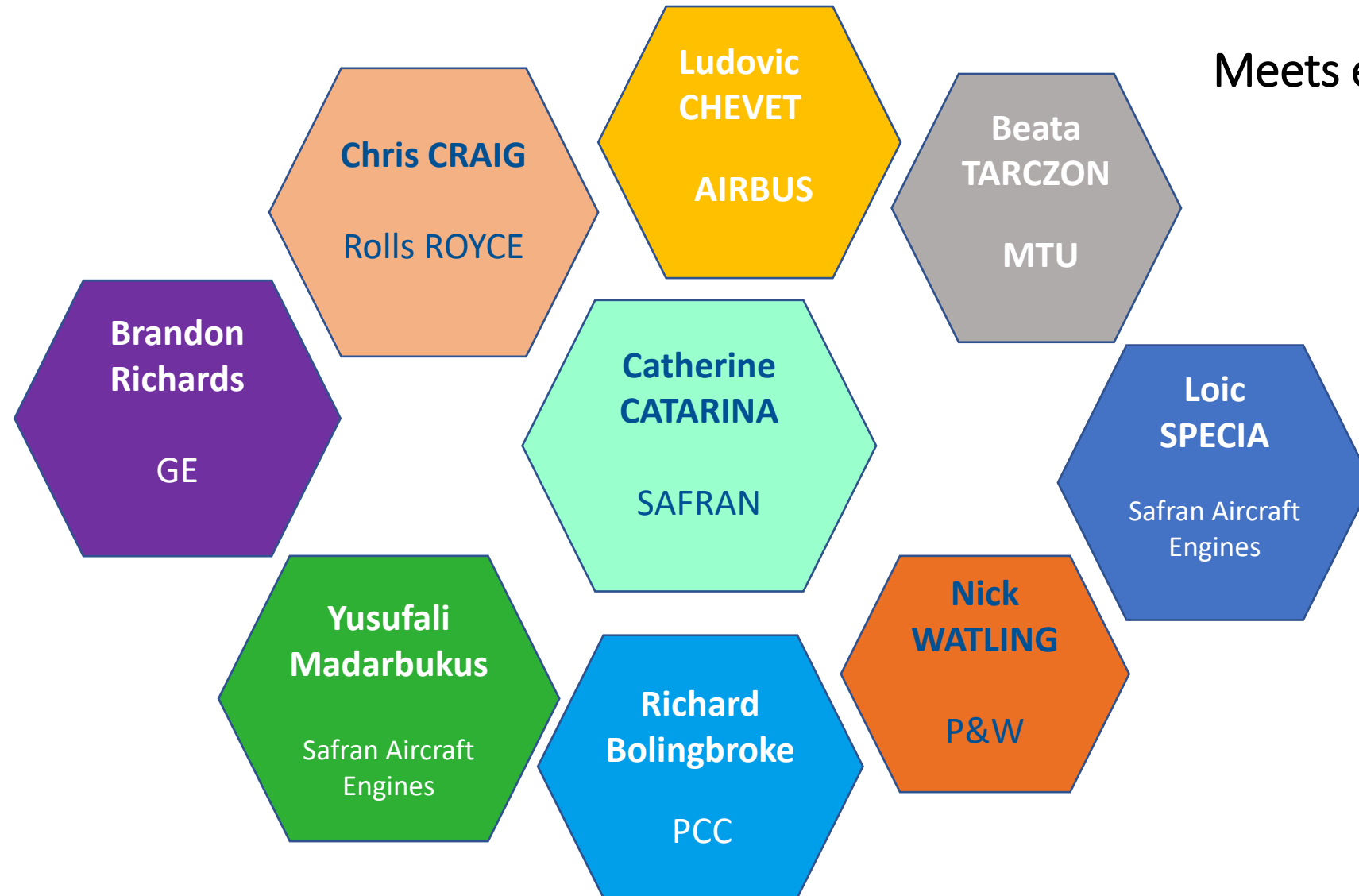


Subject Matter of interest Groups : WHO are we? What are our concerned?



- The purpose of the Subject Matter Interest Group is to **promote the effective deployment** of the Quality Subject across the AESQ Supply Chain.
 - The Group is made up of **Subject Matter Experts** from the AESQ Member Companies.
 - The Group is **accountable** for the AS13100 related Requirements and associated Reference Manual content, ensuring that it is **up to date** and reflects current knowledge and best practice.
- It shall promote the effective deployment of the Reference Manual using **Communities of Practice** (CoP). The CoP is open to any subject matter expert from the AESQ Member Companies and the wider AESQ supply chain.
 - Activities may include **webinars**, **best practice** sharing, development of shared **training materials**, **conferences** and published **papers**.

Human Factors Subject Matter of interest Groups : The Team



Meets every Two or Three Weeks

What have we been doing ?

Sharing experience within the group



Objectiv : Share those best practices with you to help HF deployment at your plants

- Communication Kits within our organizations.
- Awareness kit to empower leaders and teams
- Best practices company wide
- Best Practices and deployment at some suppliers

REFRESH ON REFERENCE MANUAL RM13010 HUMAN FACTORS



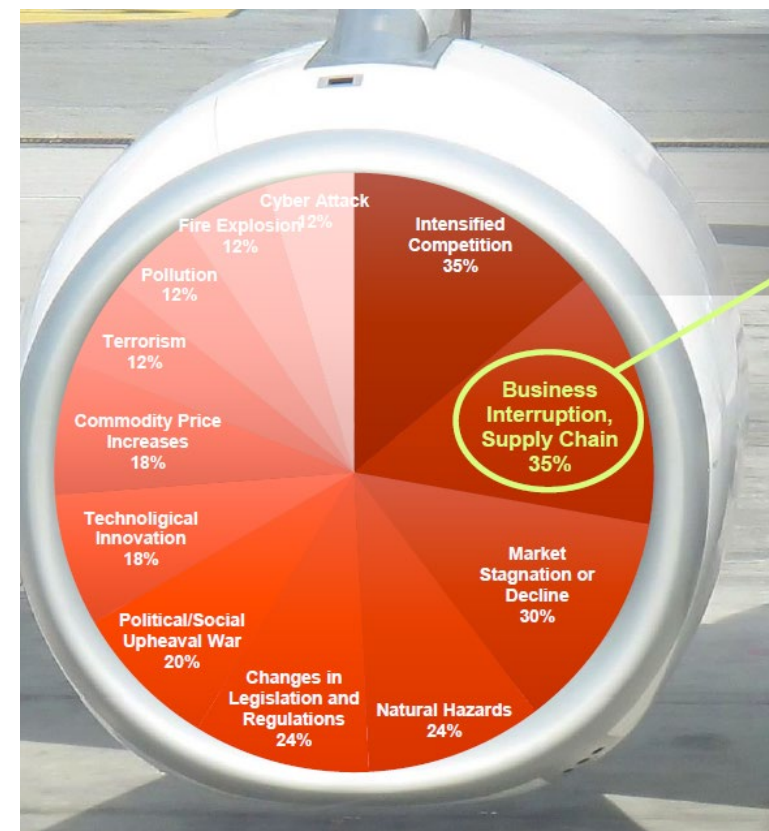
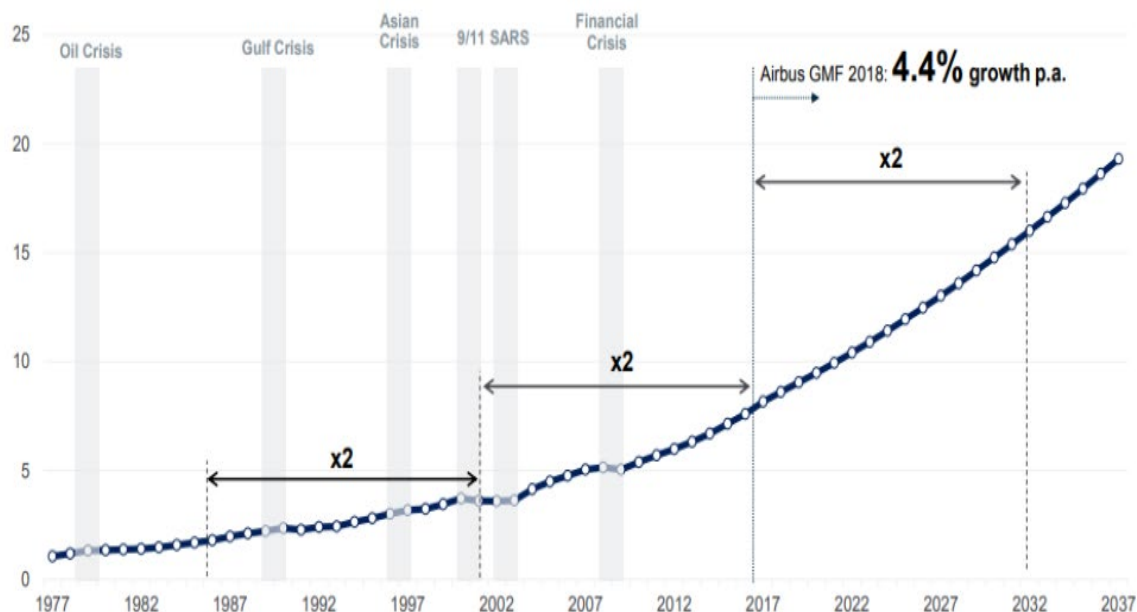
CATHERINE CATARINA-GRACA
SUPPLIER MANAGEMENT SYSTEM COORDINATOR
SAFRAN AIRCRAFT ENGINES

Why Human Factors in AS 13100

- Air traffic should double every 15 / 20 years
- Supply Chain risks are today one of the greatest concern for aviation stakeholders

The Market

Source: Airbus GMF 2018



Human Errors
are
the origin of
most
supply chain
issues
(About 80%)

Source:
Allianz Risk Barometer 2014
Note:
Respondents could select
more than one risk

FILM FLIGHT SAFETY



Human errors

Minimizing human errors in the supply chain **is key** toward product safety, quality and delivery

Human Errors



Human Factors Overview

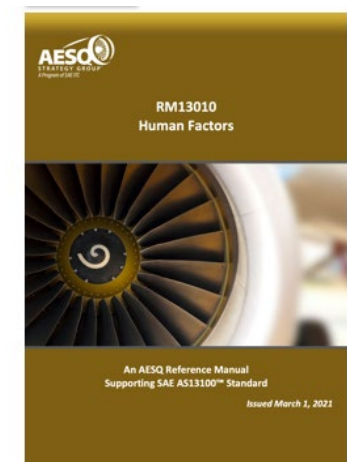


- **Human Factors are becoming a key theme in the Part 21 Aerospace Industry due to**

- Human Factors are a key element of the ICAO Annex 19 Safety Management System requirements (Due to be published in 2022)
- Increase is non-conformance causal factors related to Human Factors
- Airframers are now demanding it as a requirement for their suppliers
- Human Factors has been required in Maintenance organizations for the past 20 years



AS13100 Supplemental Paragraph Reference	
4.4.3	All processes in the QMS must be documented , HF as part of this QMS needs to be documented
5.1.1.1	Leadership : <i>Top Management shall reflect a commitment to Human Factors</i>
5.2.1.1	Leadership: Establishing the Quality Policy / HF Policy
7.3.1	<i>Human Factors Awareness. The organization shall provide an appropriate program of training and awareness of Human Factors based on role</i>



Human Factors quality management system

- Human Factors should be an integrated part of :

- product and service design,
- manufacturing / assembly,
- and product servicing.



AS13100 Standard Section 4 Context of the Organization

Human Factors Training



- The organization shall train its employees in the understanding of Human factors and how they relate to the work that they do.
- The training will include a review of the 'Dirty Dozen' behaviors and typical mitigation actions.
- The training program will be repeated at scheduled intervals to act as a refresher (see also 7.3.1)
- Certain roles may need specific detailed training in addition to this e.g. Human Factor Investigations

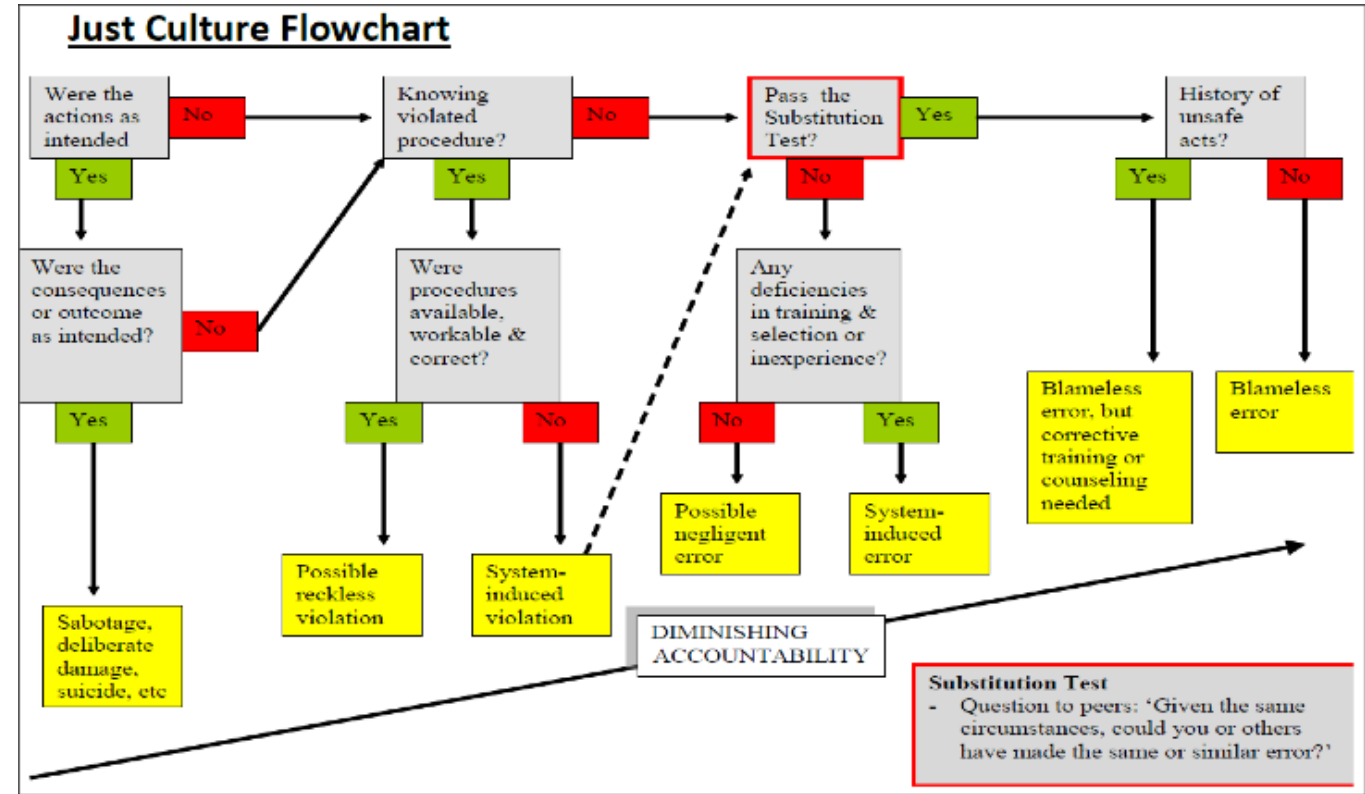
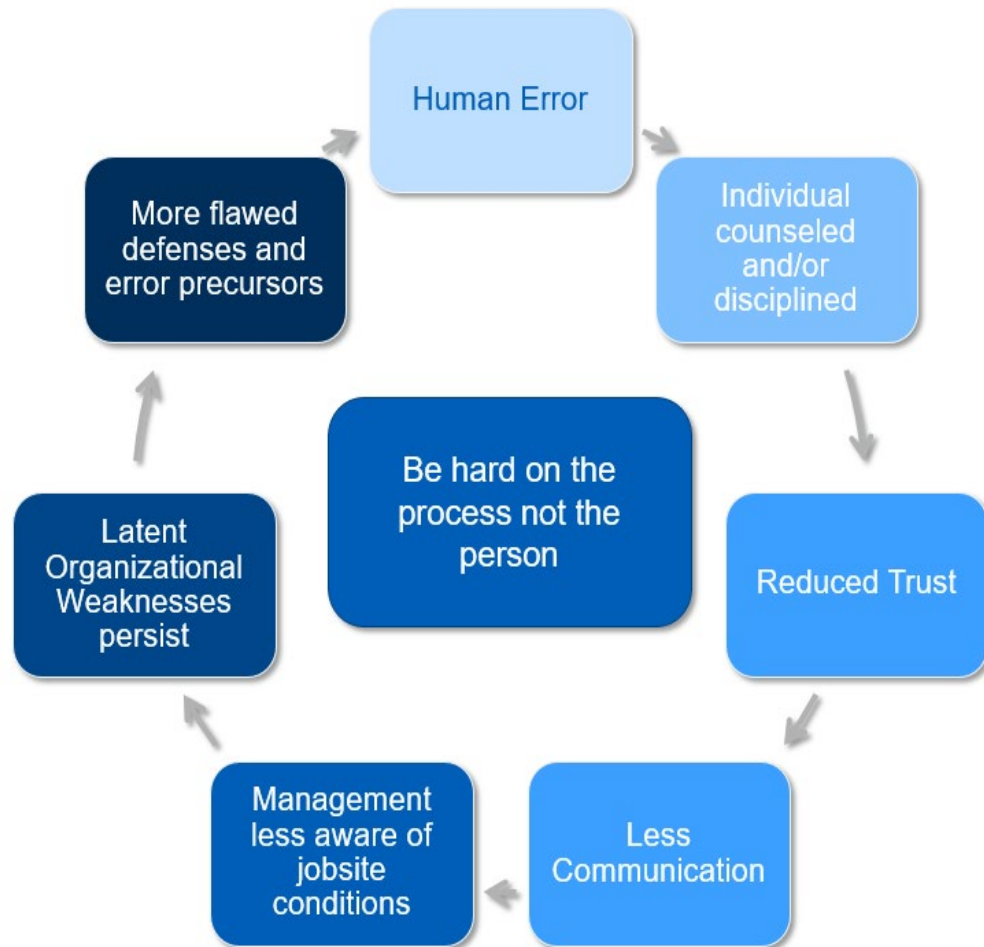
incident reporting process



* Aéroplanes Henry Potez
In your work, an error,
something forgotten or bad workmanship
can cause the death of one or more people
.....
A person who makes an error must report it
An error is a repairable and pardonnable mistake
But hiding it is a crime

- The organization shall put in place an open reporting system for all mistakes and near misses (it is important that even minor occurrences are investigated).
- Learn from accidents and incidents to take appropriate action to prevent recurrence.
- After investigation communicate the lessons learned and the preventive action plan.

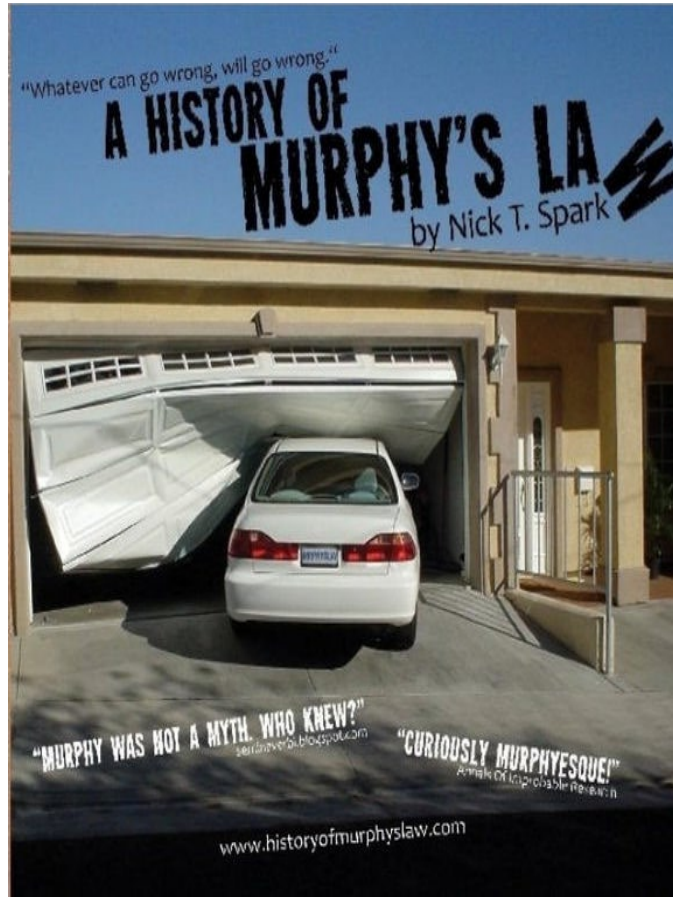
Human Factors Open Reporting Culture



Investigating responsibility helps managers to be fair

An atmosphere of trust in which people are encouraged, for providing essential safety-related information.

Human Factors investigation process



MURPHY'S LAW "If It Can Happen, It Will"

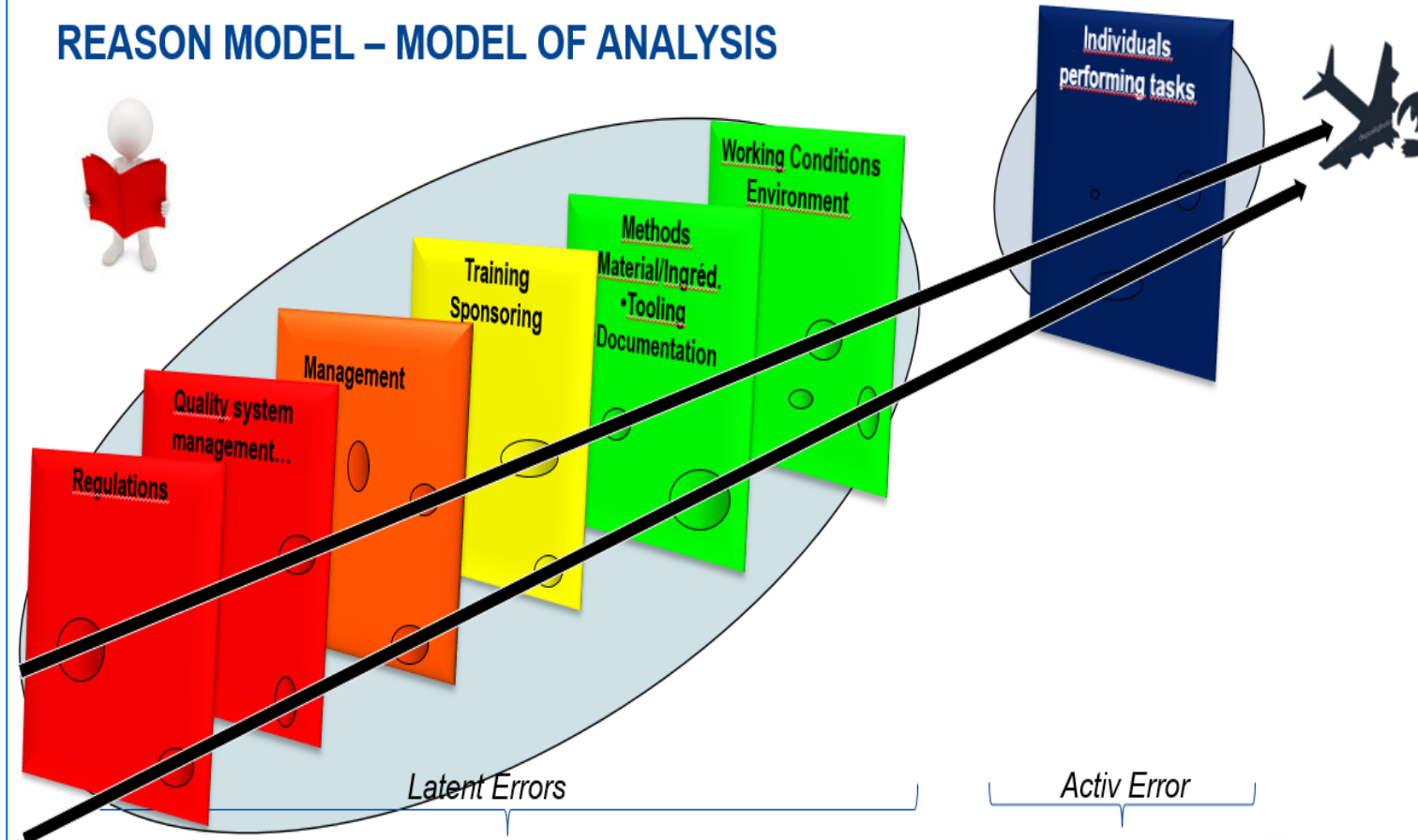
Abstract:

- Errors are not made deliberately
- Several contributory factors lead to an error (accident / anomaly)
- Most of these contributory factors can be corrected.
- Several studies show that for each ERROR there is an average 4 contributory factors...

They need to be identified

Human Factors investigation process example

REASON MODEL – MODEL OF ANALYSIS



- Organizational failures must be identified because of their influence on human performances.
- Indeed, they produce situations conducive to error: inefficient communication, distance from the field, lack of experience.

Organizational factors are involved in a large-scale of accidents / Incidents !



It is major to nominate a human factor focal point (project manager) who is

- Leading action plans
- Following Kpis
- Assessing maturity

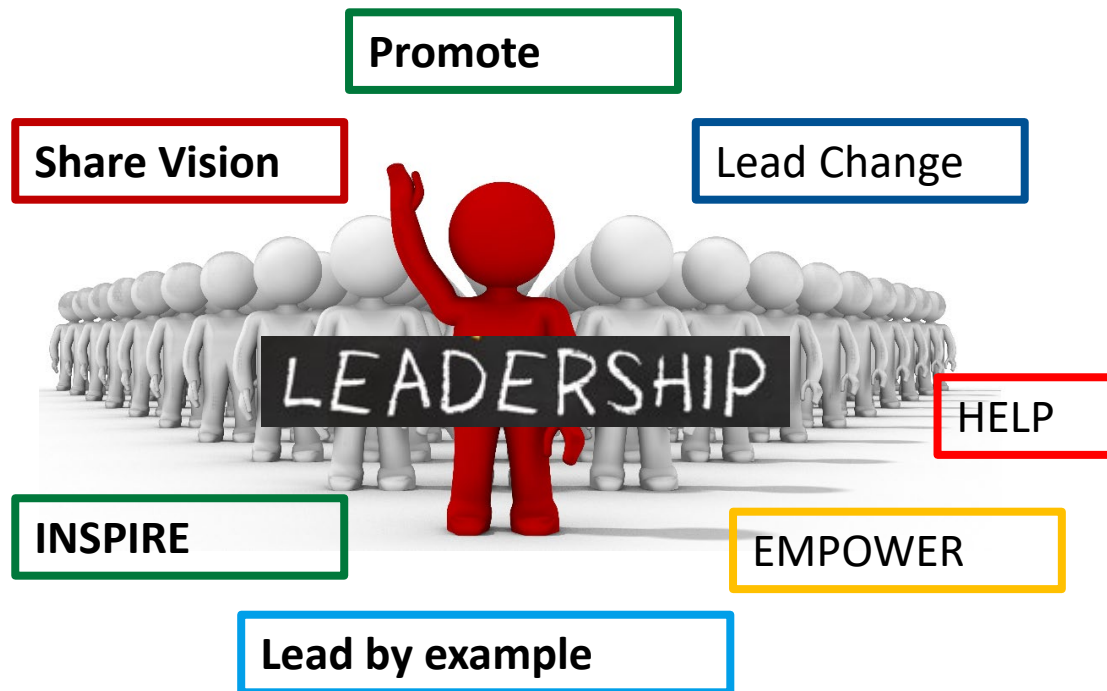
These reviews need to be performed on regular basis and approved by the steering committee

Follow the milestones of continuous improvement

HUMAN FACTORS LEADERSHIP AND POLICY

Human Factors Leadership

*Top Management shall reflect
a commitment to Human Factors*



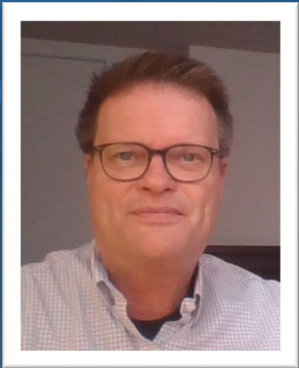
HF Policy

*The organization shall have a policy that promotes
Human Factors*

Commitment



FOCUS ON HF POLICY AND LEADERSHIP



Nicholas Watling
Sr. Mgr Engine Centre Quality
Pratt & Whitney Canada

HUMAN FACTORS LEADERSHIP AND POLICY

Human Factors Leadership

*Top Management shall reflect
a commitment to Human Factors*



HUMAN FACTORS - Human Factors is the way the People, Programs and Processes, the Work Environment, Organization and Equipment all work together as a system. The individual is at the middle of that system. **Any flaws in the system impact the performance of the individual and any flaws in the individual impact the system.**

The nature, volume and lifespan of our product means that there is a significant human element in the design, manufacturing and service processes.



HUMAN FACTORS LEADERSHIP AND POLICY

HF Policy

The organization shall have a policy that promotes Human Factors

Commitment



Embedding Human Factors in your company culture and processes is, therefore, a key element of product safety and quality.

A clear policy explaining what and how the company will embed a Human Factors framework within their operating system is a must. This can be within an existing company policy and it is recommended that this be either the company's Quality or Safety policy.

Successful execution requires leadership commitment to this policy.

HUMAN FACTORS LEADERSHIP AND POLICY

HF Policy

The organization shall have a policy that promotes Human Factors

Commitment



For a policy statement to be effective it needs to be well thought out, relevant and clear.

It should address:

- Living a just culture by ensuring the company defines what behaviour is tolerated by the organisation and what is not.
- Providing awareness of Human Factors & engaging the workforce in open discussions
- Embedding open reporting to capture hazards, mistakes and risks
- Considering Human Factors within investigations to get to the root causes that led to a human error and ensure appropriate action.
- Continually improving through reducing the risk of Human Factors influencing outcomes.

HUMAN FACTORS LEADERSHIP AND POLICY

Human Factors Leadership

*Top Management shall reflect
a commitment to Human Factors*



Human Factors initiatives will be more effective if they are integrated within existing processes. Much of Human Factors are common sense, professionalism, quality management, and safety management.

Human Factors best practices should be seamlessly and invisibly integrated within existing processes, such as training, open reporting, problem investigations and risk reduction practises.

It should be clearly defined how Human Factors is considered and managed in all aspects of the organizations' processes, cross functionally and throughout the product or service lifecycle.

HUMAN FACTORS LEADERSHIP AND POLICY

Human Factors Leadership

*Top Management shall reflect
a commitment to Human Factors*



Considerations for leadership when embedding the policy in the company should include:

- Understanding and recognising the impact of company culture.
- Ensuring change and on-going communication.
- Providing both Human Factors awareness training sessions and training to support open reporting, problem investigations and risk reduction practises.
- Ensuring that the influence & risk of Human Factors is assessed regularly, in all aspects of the business, and that plans are put in place for continuous improvement
- Promoting a culture that encourages open and honest reporting from everyone to ensure potential & known unsafe acts and risks are reported and appropriate actions taken.

HUMAN FACTORS LEADERSHIP AND POLICY

Human Factors Leadership

*Top Management shall reflect
a commitment to Human Factors*



Considerations for leadership when embedding the policy in the company should include:

- Setting up a defined network across the business of people to support the implementation and sustainment of the Human Factors policy.
- Identifying how the company's risk management process considers Human Factors.
- Ensuring processes within the management system support the principles outlined in the policy and provide employees with the means of compliance.

Some examples

EXAMPLE OF HF POLICY

HUMAN FACTORS AND JUST CULTURE INCORPORATION INTO ROLLS-ROYCE GROUP SAFETY POLICY



Chris Craig
Senior Operations Quality Manager
Rolls-Royce

Our Safety Policy

- You can find our Code by googling “Rolls-Royce Code”
- This then links to our values, including “Operate Safely”
- And our Group Policies, including the Product Safety policy.



Product safety

Our product safety goal is to eliminate, as far as possible, the risk of product failure. This includes anything that could affect the safe operation of the Rolls-Royce product, the platform on which the product is installed, the people using or maintaining the product, or any long term negative impact to the environment in which it operates.



Principles

- Everyone who works in Rolls-Royce shares responsibility for product safety.
- We are aware of the safety impact of our actions and accept that we all have a duty to protect and improve product safety.
- We prioritise safety-related tasks so they get the right attention, time and resource.



We will

- Be curious and take action to anticipate and identify potential product safety risks;
- Not act in any way that could have a negative impact on the safety of our products; and
- Assume positive intent and stay open-minded if others express product safety concerns, even if they are about our own behaviours.

Everyone has a shared responsibility for the safety of our products

Identify safety risks, including **Human** and **Organisational** factors

Expectation to minimise risk behaviours

This links to treating people fairly and having a **Just Culture**

Our Safety Policy

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I believe that the way a new product is being built might, under certain rare circumstances, lead to safety issues. It's a remote chance and the product is important to us and our customer so I don't need to say anything, do I?

Yes! The safety of our products is vital to the lives and livelihoods of thousands of people, and our reputation and success depend on it. Always speak up about your concerns. All product safety concerns must be raised using Group Procedure Product Safety 3.1 to ensure the accountable person is made aware and can take appropriate action. Start by speaking to your manager. If you feel unable to speak to your manager, ask the next level of management or your local Head of Product Safety Assurance for advice. Or you can speak to your Local Ethics Adviser or raise the concern on the Rolls-Royce Ethics Line. Whichever route you take, it is important to speak up.

Focus on speaking up and reporting safety hazards

Concerns can include Human and Organisational factors

Reinforcement for speaking up

Our Safety Policy

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PRODUCT SAFETY

A. Policy values

Rolls-Royce provides mission critical products that people's lives depend on. Our commitment to the safety of our products is therefore at the heart of our 'Operate Safely' core value.

Everything we deliver to a customer is our product - hardware, software, services and documentation, whether delivered separately or integrated into systems.

B. Principles

Five principles govern our approach to product safety:

1. Leadership commitment and accountability
Our leaders champion product safety and prioritise it so that safety-related tasks get the right attention, time and resources. We make accountability for product safety clear and ensure people understand what they are accountable for.
2. Level of product safety
We design our products to achieve a high level of safety consistent with their application, always ensuring that we meet or better the relevant company, legal, regulatory and industry requirements. We assess what could go wrong and put controls in place to meet the required safety levels throughout the product lifecycle and reduce the safety risks so far as is reasonably practicable. We evaluate how human and organisational factors can introduce risks to product safety and use our understanding when setting our controls.
3. Maintaining and improving product safety
We are committed to the continuous improvement of product safety and actively engage in setting industry standards and good practice. We measure our performance and rigorously investigate and resolve safety-related issues, systematically embedding the learning from these back into our practices and processes. Everyone is encouraged to report any product safety concerns.
4. Conforming product
Robust quality is an essential building block of product safety and by following our processes we ensure that our products and those of our suppliers conform to their specification.

Highlights the importance by incorporating within the **Product Safety** policy

Evaluating and controlling **Human and Organisational** factors sits within the policy

Our Safety Policy

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PRODUCT SAFETY

Rolls-Royce Holdings plc Group Policies
Operate Safely

08

5. Safety awareness and competence

Everyone who works in Rolls-Royce shares responsibility for product safety and we have to be mindful of the safety implications of our actions. Training is provided so that our people understand the Rolls-Royce Product Safety Policy and processes and can fulfil their collective and personal responsibility.

These principles are the foundation of our Product Safety Management System which is governed by the Company Product Safety Assurance Board.

C. Expectations

Always speak up about a product safety concern if you see one, report it if you have any doubt and remember, we are committed to treating everyone fairly and without prejudice in accordance with Our Code.

Always follow the parts of the Rolls-Royce Management System applicable to your role.

You should feel able and supported to perform the tasks assigned to you. If you are being asked to do something which you do not feel qualified and/or experienced enough to do you should discuss with your manager.

Make sure you attend the Safety Awareness training appropriate to you.

For additional guidance, Group Procedures, product safety documents and key contacts please access:

- Product Safety Management System Manual
- Safety and Product Assurance Engine Room

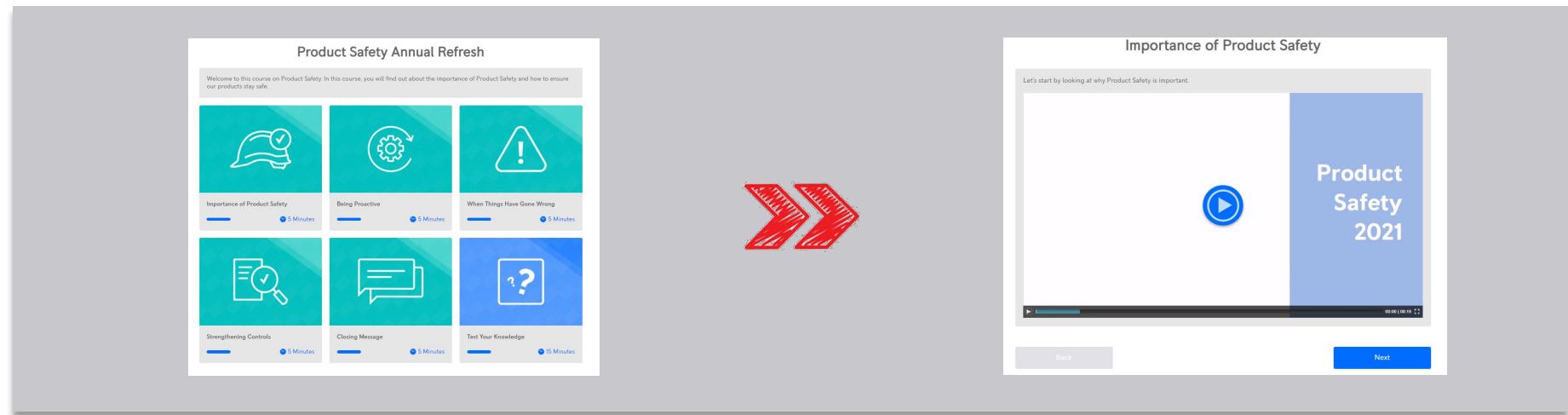
Everyone is responsible for minimising risk behaviours

Everyone is expected to report concerns

The expectation for the organisation to live a **Just Culture** to support speaking up and reporting safety concerns, including **Human** and **Organisational** factors

Leadership

- The incorporation of Human factors and Just Culture is reinforced through the **Product Safety Annual Refresh** training.
- This training is mandatory for all employees to complete.
- The training is computer based and consists of leadership videos highlighting the important messages.



“So we always need to make sure we are thinking about **human factors** in our products. We’ve got to understand that people do have up times and down times. If a designer is working particularly long hours for instance, will they make a mistake? We need to worry about those things as leaders of the organisation and make sure we are taking those **human factors** in to account” - **Chris Young, Group Chief Engineer**

“So many of you may have heard the term **just culture** and **just culture** is an important part of our safety journey at Rolls-Royce. What **just culture** means is an acknowledgement that mistakes are generally the product of faulty organisational cultures or other system failings as opposed to being attributed to the one or two people may be directly involved in the incident itself. It’s the antithesis if you like of a blame culture, in which we try and attribute any mistakes to one individual and then believe that, that particular risk is mitigated by punishing that one person and part of a **just culture** is getting people to be bold enough and confident enough to speak up when they see something going wrong or about to go wrong, secure in the knowledge that their concerns will be taken seriously by their peers and by their line managers and we all actually have a duty to speak up when we see safety risk.” – **Harry Holt, Chief People Officer**

“Speaking up is vital. A **just culture** is about there being no fear within the organisation for raising issues with high consequence and we have to get to a position where everybody feels comfortable, they feel confident that they can raise any issue regardless of the consequence to cost, reputation or programme that has a safety impact and a **just culture** maintains that environment where that is possible” – **Matt Blake, Chief Engineer - Small Modular Reactors**

EXAMPLE OF LEADERSHIP EMPOWERMENT



BEATA TARCZON
QUALITY SYSTEM ENGINEER
MTU AERO ENGINES POLSKA.



Human Factor at MTU AE Polska

HF leadership - workshops

Human Factor leadership

AS13100

5.1.1.1 General - Supplemental Requirements

Top Management shall demonstrate a commitment to Human Factors in accordance with 4.4.3 and 7.3.1, see RM13010.

RM13010

6.3 Employee engagement & monitoring

A core part of leadership commitment to Human Factors is to ensure the “leadership shadow” is visible and the intent of the Human Factors policy is delivered through both the actions and behaviours of people within the company.


Employees need to have confidence in the just culture and the supporting processes (e.g. reporting system) so they know that confidentiality will be maintained and that information they submit will be acted upon, otherwise they could decide there is no benefit in their reporting

*What we want do to **achieve** it?*

Understanding each other!

Human Factor campaign – workshops by leaders

Assumptions of HF campaign in MTU Polska:

4 parts , quarterly approach				
	PART I	PART II	PART III	PART IV
	Lack of Teamwork	Stress	Complacency	Lack of Knowledge
	Lack of Communication	Fatigue	Norms	Lack of Awareness
	Lack of Assertiveness	Pressure	Lack of Resources	Distraction
	Q1	Q2	Q3	Q4

Just Culture is the base!

We are the one team!

Understanding of Human Factors by leader is crucial for success!

Do not improve others, work on your team!

Supported by
professional HF trainer

Human Factor campaign – workshops by leaders

HF workshops
performed by leaders
with own teams

4 parts , quarterly approach

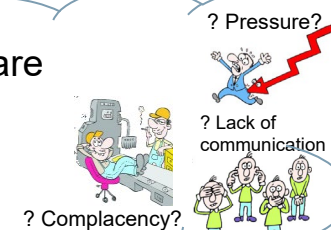
DIRTY 12	PART I	PART II	PART III	PART IV
	Lack of Teamwork	Stress	Complacency	Lack of Knowledge
	Lack of Communication	Fatigue	Norms	Lack of Awareness
	Lack of Assertiveness	Pressure	Lack of Resources	Distraction
	Q1	Q2	Q3	Q4

**Just
Culture!**

Introduction
– some HF
theory

Lets talk
about our
TEAM!

Which factors are
mostly present
in our job?



Current status within
team

Supported by
professional HF trainer



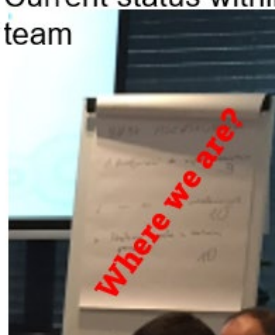
Human Factor campaign – workshops by leaders

HF actions defined
by team with leaders
focusing of own area

4 parts , quarterly approach

DIRTY 12	PART I	PART II	PART III	PART IV
	Lack of Teamwork	Stress	Complacency	Lack of Knowledge
	Lack of Communication	Fatigue	Norms	Lack of Awareness
	Lack of Assertiveness	Pressure	Lack of Resources	Distraction
	Q1	Q2	Q3	Q4

Current status within
team



Can it be
better?

What can help to reduce impact
of Human Factor in my
team?

**Human
Factor
reduction
-
Action list**

Supported by
professional HF trainer

Human Factor campaign – workshops

Supporting actions – to keep people more involved in campaign

For every employee specially designed by MTU
Desk planner
Desk calendar – 1 Dirty Dozen/month

Magnetic board
with Dirty Dozen
big size puzzles



Flyer + crossword
Team competition
(with award lottery for the team)



COMMUNICATION WITHIN THE COMPANY : PRACTICAL APPLICATION OF HUMAN FACTORS



Richard Bolingbroke
Quality Assurance VP – TIMET

Practical application of Human Factors

- Recognizing link to organizational culture, impact of people and likelihood of events occurring.
- Appreciating the synergy with Health and Safety.
- Distinguishing between an unintentional event and a violation.

HUMAN FACTORS

What is Human Factors?

Human Factors, or Human Performance, is the way the People, Programs and Processes, the Work Environment, Organization and Equipment all work together as a system. The individual is at the middle of that system – any flaws in the system affect the performance of the individual and any flaws in the individual impact the system.



90% of significant events are caused by something other than just the individual.

Who does it?

Human Performance is the responsibility of everyone in the organization to continuously remain aware of the impact on processes and other individuals.

Human Performance Guiding Principles

- Organizational values influence individual behaviors
- Performance is based on reinforcement and self-motivation
- People are fallible
- Error-likely situations can be predicted, managed, and prevented but only if recognized
- Events can be avoided by understanding causes and applying lessons learned

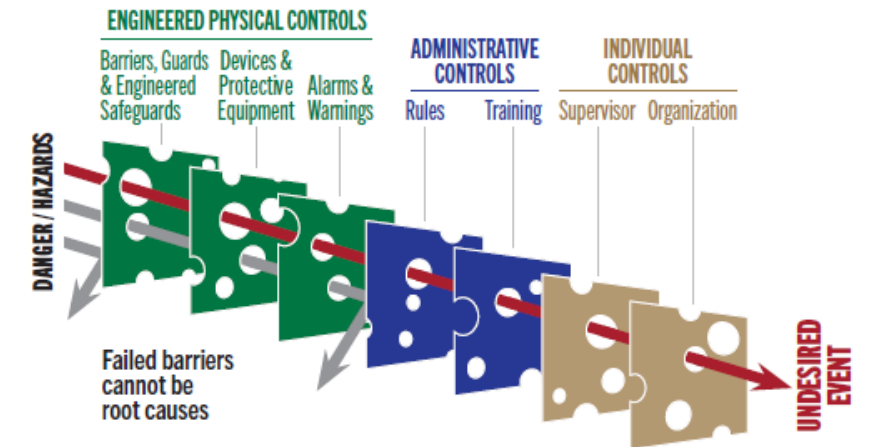
Definition of Human Error

An action or inaction that unintentionally:

- Results in an undesirable or unwanted condition
- Deviates from a set of rules or expectations, or
- Leads a task or system outside acceptable limits

A **Violation** is an action or inaction that intentionally deviates from a set of rules.

Cheese Model of Incident Causations



5 Stages of Detecting & Assessing Human Factor Risk

	What are errors and how do they occur?	Recognize HP as a system based on science
	How do we predict when we are more likely to make an error?	Become familiar with Performance Modes
	How do we recognize the potential for an error?	Define triggers and their role in error prevention
	How do we identify error-likely situations?	Identify common error traps or precursors
	What tools do we use to reduce our likelihood of error?	Recognize and practice the application of HP tools

Practical application of Human Factors

- Realizing people operate in different performance modes – people do what they do, at the time they do it, for reasons that make sense at that time.
- Employing preventative tools, as well as reactive ones, that help all employees consider the impact of HF and shape the culture

Performance Modes



Performance modes are dynamic and constantly changing. Performance modes help us predict the potential risk of error when conducting a specific task. People do what they do, at the time they do it, for reasons that make sense at that time. If I want to find the system drivers - I need to find out WHY it made sense to them.

The 3 Types of Performance Modes

PERFORMANCE MODE	KEY WORDS	ERROR RATE	EXAMPLES
SKILL BASED Routine, repetitive & habitual. Little or no conscious thought	<ul style="list-style-type: none"> Habit - Not thinking Low / no conscious thought Fewer than 7 steps or actions 50-100 times successfully in < 6-months 	1:1000	<ul style="list-style-type: none"> Driving to/from work Tying your shoes Brushing your teeth Crossing your arms
RULE BASED There is a rule and I know the rule exists	<ul style="list-style-type: none"> Has the knowledge, skills & experience Written and unwritten rules (SOPs, JSAs...) Knows the rules & procedures Takes a shortcut Rule or procedure is WRONG 	1:100	<ul style="list-style-type: none"> SOPs Drawings Checklists Signs Side of bed you sleep on Parking rules
KNOWLEDGE BASED You don't know what you don't know – lack of knowledge about task	<ul style="list-style-type: none"> Almost always during problem solving DOES NOT HAVE the knowledge, skills, and experience Rule or procedure that applies does not exist or person is unaware You can't think your way out 	1:2 - 1:10	<ul style="list-style-type: none"> 1st time task Upset condition Unexpected condition

Error Traps and Triggers



Triggers tell us something is not right and may warn us of a potential error trap. A human performance tool is a method used to avoid traps so that we can prevent errors, events, and incidents.

Typical Error Traps and Prevention Tools

TRAP	TRIGGER		TOOLS
Stress & Time Pressure	<ul style="list-style-type: none"> Anxiety Losing appetite Fast heart beat Multiple minor errors Impatience toward coworkers 	<ul style="list-style-type: none"> Emotional outburst Tight time schedule Preoccupied with task at hand Doing more than one task at a time 	<ul style="list-style-type: none"> Self-Check using STAR (Stop – Think – Act – Review) Quality 10 count
Distractive Environment	<ul style="list-style-type: none"> Feeling pulled in many directions Not in control of the situation Low level of concentration on each task Frequent distractions Leaving original job in the middle Forgetting the condition when returning to a job Making minor errors 		<ul style="list-style-type: none"> Self-Check using STAR (Stop – Think – Act – Review) Record the As-left condition PFMEA Quality 10 count
Vague or Incorrect Guidance	<ul style="list-style-type: none"> Guidance is inconsistent with past experience Guidance is inconsistent with the established work practices Guidance is inconsistent with other documents Documents are outdated Guidance is too vague to the job Guidance doesn't match previous experience Documents contain obvious, but minor errors Not using procedures in the field 		<ul style="list-style-type: none"> Step-by-Step STOP & seek out when unsure Three-Way Communication PFMEA Quality 10 count 8D
Overconfidence	<ul style="list-style-type: none"> Tunnel vision (not assessing all options) Bias (personal preference) Mindset (no need for improvement, no need to follow procedures, etc.) 	<ul style="list-style-type: none"> First-time evolution Implied experience Short time duration task Time pressure 	<ul style="list-style-type: none"> Step-by-Step STOP & seek out when unsure
Vague or Incorrect Guidance – Mental Burden	<ul style="list-style-type: none"> You were told something once (in training, by a Supervisor, etc.) and now you have to figure out when and how to apply it. You were told something earlier (in the procedure or other means) and now you have to figure out when it applies. 		<ul style="list-style-type: none"> Step-by-Step STOP & seek out when unsure Three-Way Communication
First Time (or Infrequent) Task	<ul style="list-style-type: none"> Unfamiliar with the details Not know the rules Not knowing where to find information A new task that has not been done before You have little related experience You have not done this task in over 6 months 		<ul style="list-style-type: none"> Step-by-Step STOP & seek out when unsure PFMEA Quality 10 count

Practical application of Human Factors

AWARENESS

Introduction to HF
Error Models
Hazard Recognition
Organization Culture
Organizational Factors
Individual Performance
Environment
Working Practices
Communication
Open Reporting

REACTIVE MEASURES

8D Problem Solving
PFMEA
Auditing

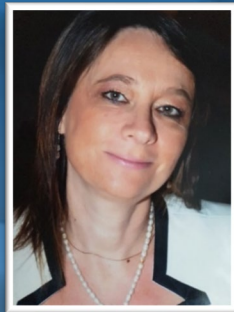
PROACTIVE MEASURES

Stop for Quality
STOP & Seek
Pre-job Checks
High Risk Task of the Day
3 Way Communication

COMMUNICATION AND MANAGEMENT OF INTERVIEWS / 8D



Yusufali MADARBUKUS
HF referent
Safran aircraft engines



Catherine Catarina-Graca
Supplier Management System Coordinator

CONTENTS



1.INTRODUCTION

2.DETAILS OF THE MILESTONES

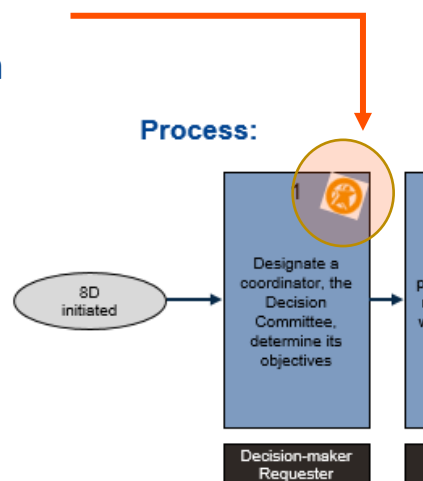


1

INTRODUCTION

INTRODUCTION



- For each milestone, we have identified the subprocesses in which HOF elements (questions, tools, media) should be taken into account:



The purpose of this document is to:
 take the human and organizational aspects into account in the 8D causal analyses
 give you the elements to be taken into account for each step of an 8D

This document is dedicated to the HOF section; it intentionally does not cover the detailed content of the 8D causal analysis method.

- Finally, for the subprocesses concerned, we have specified the required actions from an HOF viewpoint

	 Standard	 HF action(s)
D0 - 2 Make a preliminary analysis	Describe the anomaly, collect the available information, define the objective to be reached to return to a normal situation	Ensure that the emphasis is placed on the situation, time, location and impacts and not on the person(s) at the origin of the event. •Check the need to initiate the HF section

2

DETAILS OF THE MILESTONES



STANDARD

D0	Make a preliminary analysis of the problem
D1	Form the team
D2	Define the problem to be processed
D3	Contain the risks
D4	Find the root cause(s)
D5	Define and select the corrective actions
D6	Implement the chosen actions and check their effectiveness
D7	Capitalize, perpetuate, generalize
D8	Conclude the group and congratulate the team

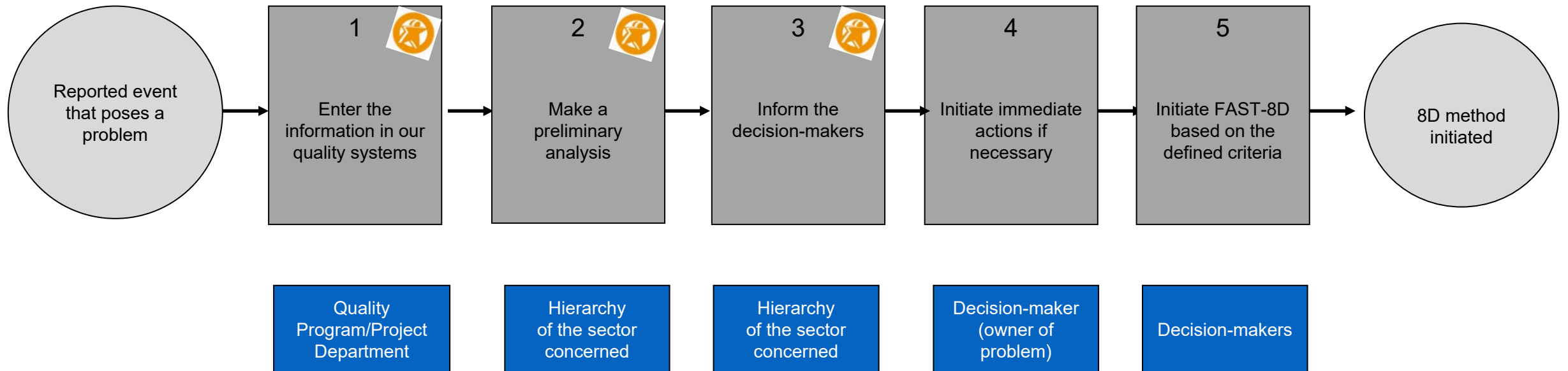


HF contributions







Ensure that the emphasis is placed on the situation, time, location and impacts and not on the person(s) at the origin of the event.
Work directly in the 8D by bringing the specific features of HOF into the context of the 8D team formed. Ensure that the FH skills are present.
Challenge the characterization of the event and of the error from a human and organizational viewpoint. Ensure that the description of the event does not contain value judgments, interpretations or opinions.
—
Ensure that the root causes linked with the persons and the organization have been studied. Characterize the facts from a human and organizational viewpoint.
Challenge the chosen solutions. Propose solutions already applied in other similar activities.
Take part in the on-site observation in order to check the effectiveness of the corrective actions and collect the feedback (REX)
Ensure that the feedback is shared within the HOF network. Update the catalog of HOF solutions / best practices.
—

DO: PRELIMINARY ANALYSIS

- Objectives: report a problem
- Recommendations: remain vigilant about the need to apply an 8D
- Process:



DO: PRELIMINARY ANALYSIS

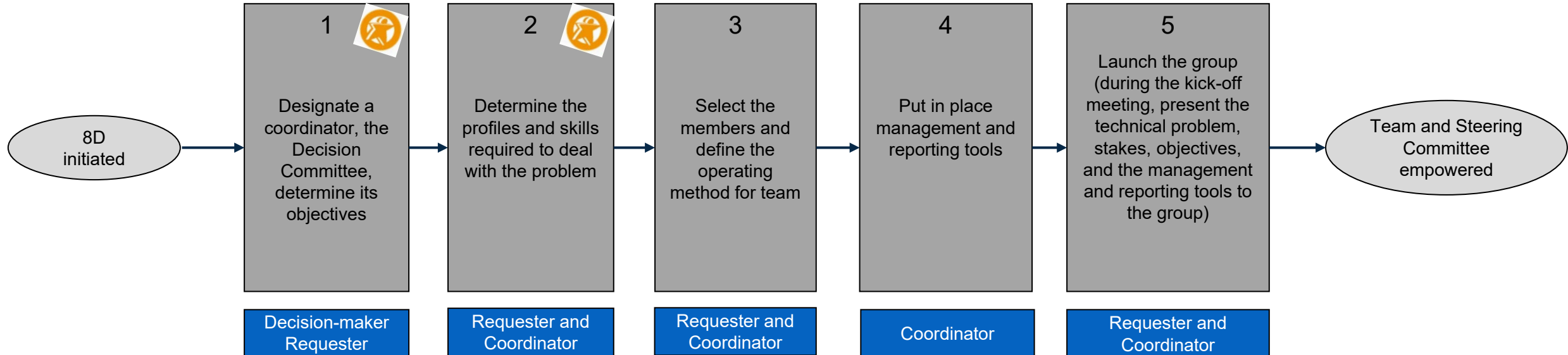
	 Standard	 HOF action(s)
D0 - 1 Enter the information in our quality systems	Formalize all major events that have been reported (Anomaly Report – Customer complaint – etc.)	Check if similar events have already happened
	 Standard	 HOF action(s)
D0 - 2 Make a preliminary analysis	Describe the anomaly, collect the available information, define the objective to be reached to return to a normal situation Confirm whether or not the problem is significant Identify the sectors concerned	Ensure that the emphasis is placed on the situation, time, location and impacts and not on the person(s) at the origin of the event. •Check the need to initiate the HF section •Determine if the activity concerned is a mechanical or human activity •Determine if the nonquality event has already happened •Determine the risk of the event being repeated
	 Standard	 HOF action(s)
D0 - 3 Inform the decision-makers	Identify and inform the appropriate decision-maker(s) of the preliminary analysis that was performed	Inform the HF Advisor and the Focal Point of the sector concerned

D1: FORM THE TEAM





- Objectives:

- appoint a coordinator,
- Form the team and the Decision Committee

- Process:



D1: FORM THE TEAM

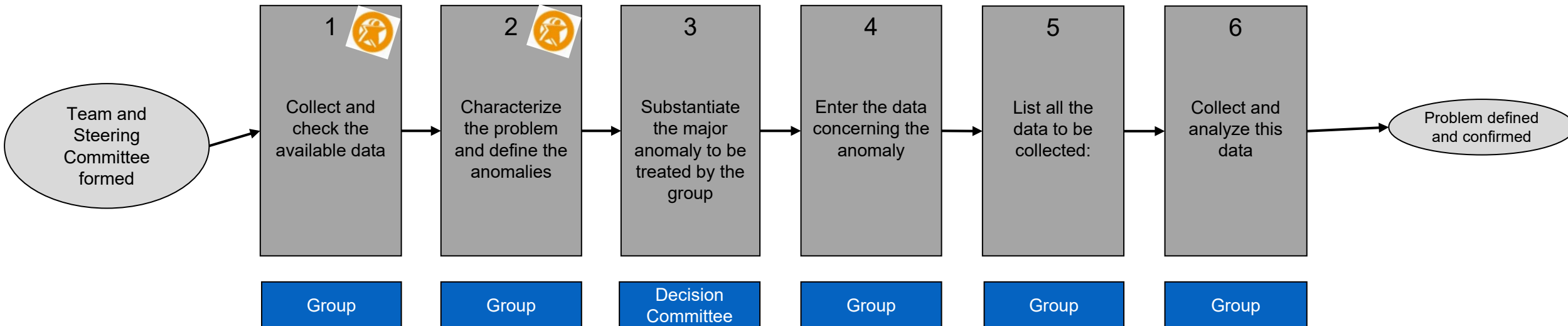
	 Standard	 HOF action(s)
<div>D1 - 1</div> <div>Appoint a coordinator, form the Steering Committee and determine the objectives</div> <div>Decision-maker Requester</div>	<p>Appoint the coordinator from among the staff trained to use the 8D method, and according to the knowledge required to deal with it</p> <p>Determine the composition of the Steering Committee</p>	<p>Include the HF Advisor or the Focal Point in the team</p>
	 Standard	 HOF action(s)
<div>D1 - 2</div> <div>Determine the profiles and skills required to deal with the problem</div> <div>Requester and Coordinator</div>	<p>Define each person's roles and missions</p>	<p>Work directly in the 8D by giving the features specific to HF in the context of the 8D team formed</p>

D2: DEFINE THE PROBLEM





- Objectives:

- Describe the perceived problem(s)
- Propose to deal with the problem identified as major

- Process:



D2: DEFINE THE PROBLEM

	 Standard	 HOF action(s)
<div>D2 - 1</div> <div>Collect and check the available data</div> <div>Group</div>	<p>Encourage the search for and collection of the available data:</p> <ul style="list-style-type: none"> • at the incident location: this data is essential for making an accurate mapping of the situation in which the anomaly was found • from the assessment: this data is acquired via the various assessment means available and that may be used depending on the nature of the anomaly • on the equipment concerned: faulty equipment and equipment in production, delivered, and installed on engines in service (condition of all the equipment) 	<p>Carry out interviews and collect items of proof as soon as possible to prevent loss of perishable data caused by a failing memory or rationalization</p> <p>Collect the facts directly from the people concerned</p> <p>Group together the available data for later analysis</p>
	 Standard	 HOF action(s)
<div>D2 - 2</div> <div>Characterize the problem and define the anomalies</div> <div>Group</div>	<p>Establish the sequence of events</p> <p>Formalize the WWWHWHW</p> <p>Use the available tools</p>	<p>Challenge the characterization of the event and of the error from a human and organizational viewpoint.</p> <p>Ensure that the description of the event does not contain value judgments, interpretations or opinions</p> <p>Ensure that the description of the facts is substantiated by the persons concerned</p>

D2:

Interview guidance

INTERVIEW GUIDE

The purpose of this guide is to provide assistance to any actor of the HOF approach who needs to interview a person as part of a causal analysis.

0- Interview preparation

- Find out about the sector where the event took place (history of events and history of the person to meet).
- Encourage the use of prepared materials to facilitate the discussion and have the list of the HOF contributing factors available.
- Be sure to implement the correct psychological conditions for the person to be interviewed (sufficient notice period and informed hierarchy).
- Provide for the interview, a space ensuring the confidentiality of discussions and initially out-of-flow, if possible.
- If several people are to be interviewed, it is essential to interview each one individually to begin with and then together if necessary.

1- Outline the context and structure of the interview

- Introduce yourself and present the HOF approach.
- State the reasons for our intervention.
- Explain that this is part of a process of sharing and continuous improvement based on trust and understanding.
- Clarify that we do not judge, we simply want to understand the event in order to identify the root causes and thus prevent recurrence.
- Reassure the interviewee that the purpose of our intervention is not intended to impose any sanctions at a later stage (on the contrary).

2- Presentation and description of the event

- Ask the interviewee to introduce themselves (background, their role, length of service in the position, etc.).
- Use the list of factors contributing to the error as the common theme for the interview.
- Let the person express themselves without any filter regarding the event (can you tell me what happened?).
- Ask the interviewee to be factual, reframe or refocus discussions on the event if necessary.
- Do not interrupt or pass judgment on what is reported.

3- Perspective and objectivity

- Encourage the interviewee to give their opinion, their perspective on the event.
- Ask if proposals for solutions are to be made to prevent recurrence or a similar case.
- Ask for their opinion regarding actions already established at the time of the interview (relevance, effectiveness, actions to be added).
- Give the interviewee the opportunity to address other subjects (sensitive or specific to their situation, their sector, etc.).
- Check whether the approach and the actors (HOF correspondent for the sector and/or the site advisor) were known before the event.

4- Contractualization of information and visibility

- Consolidate all discussions to avoid any possible errors of understanding, interpretation or retranscription.
- Confirm with the interviewee the information that they do not wish to see communicated or shared.
- Ask if other actors are to be interviewed for a better understanding of the event.
- Provide visibility regarding the rest of the interview (the interview being one of the stages of the causal analysis, outline the next steps).
- Indicate that we are likely to return to our interlocutor for further information.

5- Thanks and closing the interview

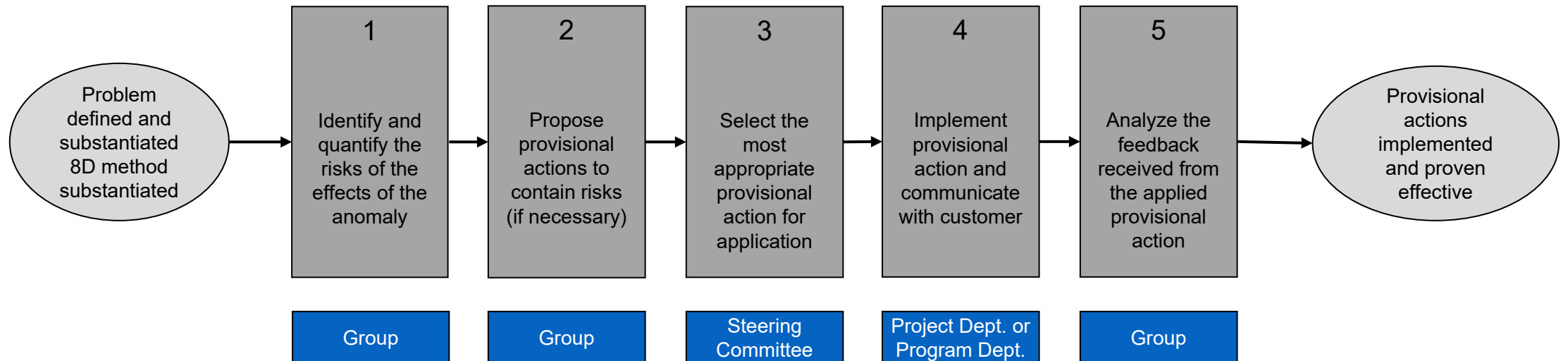
- Thank the interviewee for their availability, transparency and cooperation.
- Remind them of the golden rules and good HOF practices.
- Encourage the escalation of any weak signal or near-event via their HOF correspondent and/or the site advisor.
- Encourage the interlocutor to address the HOF approach with their colleagues on the ground.
- Ask for feedback on the interview process (areas for improvement).

D3: CONTAIN THE RISKS

- Objectives:

- Propose provisional actions to contain the effects
- Decide on the choice of actions and their application

- Process:

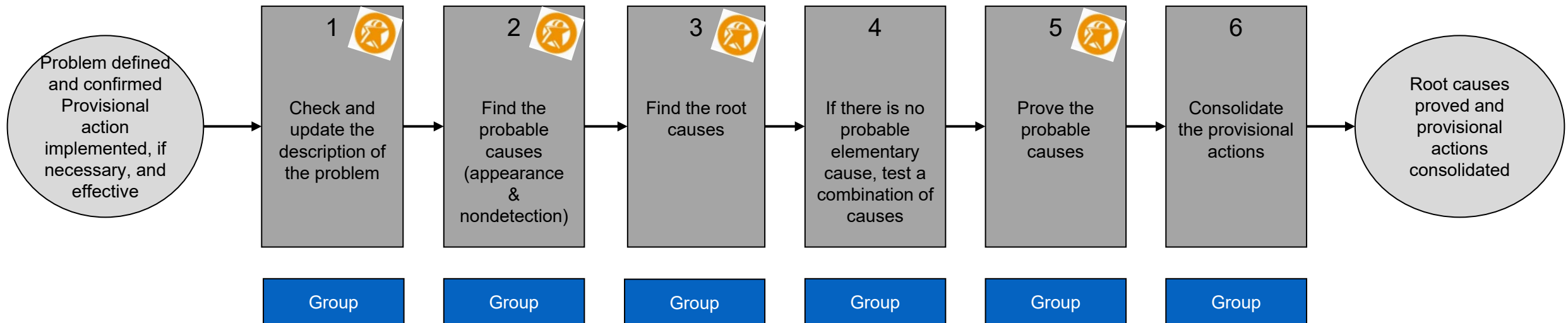


D4: FIND THE ROOT CAUSES





Objectives:

- determine the possible causes, probable causes, root cause(s)
- prove its(their) effect

Process:







D4: FIND THE ROOT CAUSES

	 Standard	 HOF action(s)
<div>D4 - 1</div> <div>Check and update the description of the problem</div> <div>Group</div>	<p>Construct a summary of the significant elements/information about the problem to be processed</p> <p>Don't hesitate to travel to locations in the field to gather information, to “touch” the parts and talk to the operational personnel.</p>	<p>Establish the sequence of events</p> <p>Define the deviations between the stipulated work and the work actually carried out (analysis of the work situation)</p> <p>Identify the shortfalls / drifts in the data and organization in place</p> <p>Provide a description of the situation, at the human and organization levels by describing the event:</p> <ul style="list-style-type: none"> • chronologically, • logically, • or by combining these 2 approaches
	 Standard	 HOF action(s)
<div>D4 - 2</div> <div>Find the probable causes (appearance & nondetection)</div> <div>Group</div>	<p>Find the possible root causes, and the causes of nondetection</p>	<p>Construct the fault tree from a human and organizational viewpoint.</p> <p>For each element, ask the same three questions each time:</p> <ol style="list-style-type: none"> 1.what caused this event to happen? 2.was this necessary? 3.was this sufficient?

D4: FIND THE ROOT CAUSES

* Don't forget the analysis of the decisions taken

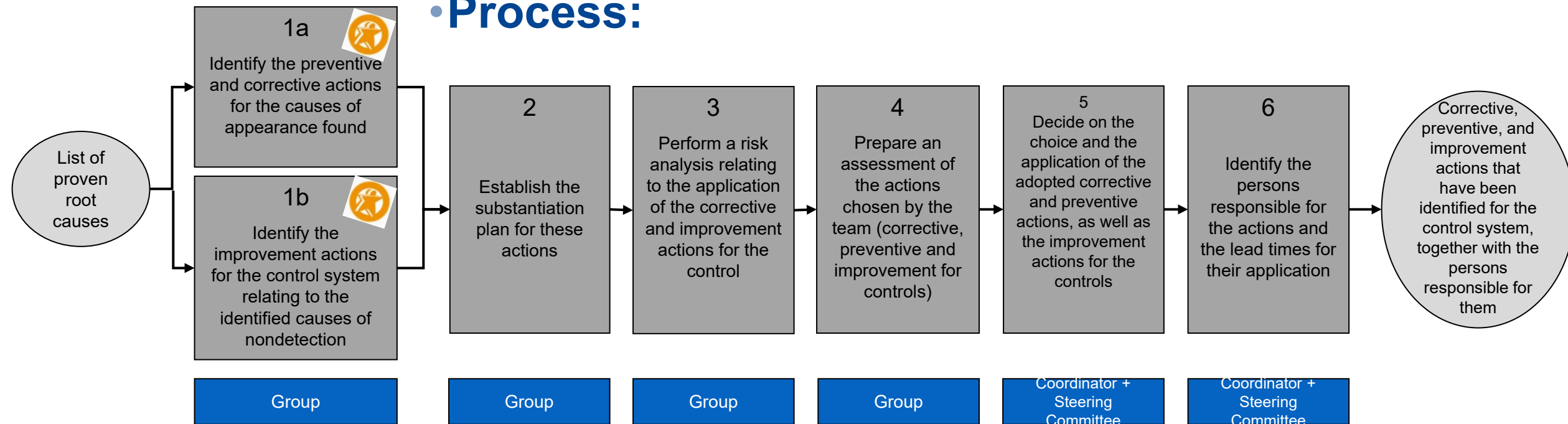
	 Standard	 HOF action(s)
<div>D4 - 3</div> <div>Find the root causes</div> <div>Group</div>	Find the root causes	<p>Ensure that the root causes linked with the persons and the organization have been studied*</p> <p>Identify the intentions or objectives of the person(s) concerned at the time the actions were carried out</p> <p>Characterize the origins of the inappropriate actions or the factors which enabled them to appear (use the contributing factor list)</p>
	 Standard	 HOF action(s)
<div>D4 - 5</div> <div>Prove the probable causes</div> <div>Group</div>	<p>Reproduce the circumstances specific to the probable causes</p> <p>Check the result obtained (presence or not of the anomaly)</p> <p>Carry out the observation at the workstation</p>	<p>Take part in the observation at the workstation</p>

D5: DEFINE AND SELECT THE CORRECTIVE ACTIONS



Objectives:

- propose corrective actions
- decide on the choice of actions to be implemented

• Process:



D5: DEFINE AND SELECT THE CORRECTIVE ACTIONS

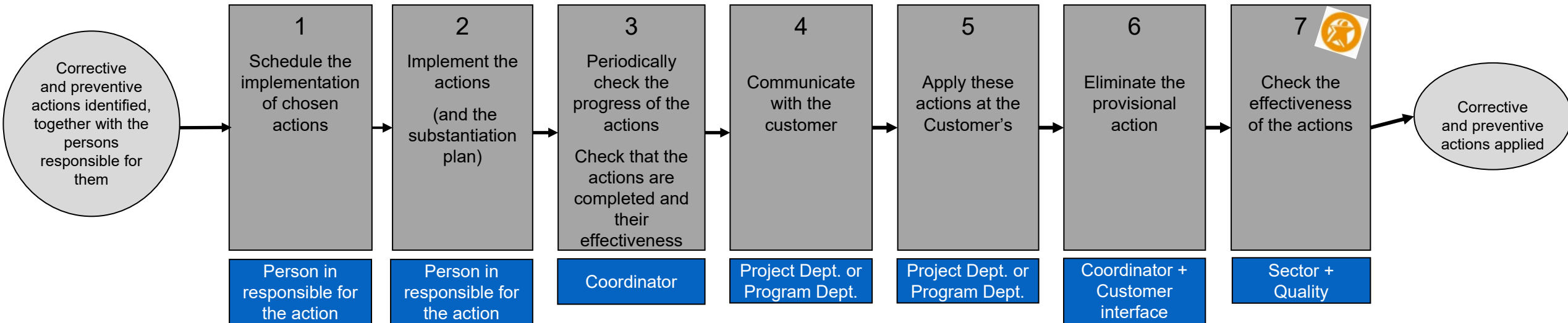
	 Standard	 HOF action(s)
<div>D5 - 1a</div> <div>Identify the preventive and corrective actions for the causes of appearance found</div>	<p>The corrective and preventive actions are to be sought based on the results of phase D4, from the studies and from the tests</p>	
<div>D5 - 1b</div> <div>Identify the improvement actions for the control system relating to the identified causes of nondetection</div>	<p>If the proven cause is a combination of several basic causes, then corrective and preventive actions shall be sought for each of the chosen causes.</p> <p>Identify the improvement actions for the control systems</p>	<p>Make the anomaly visible Prohibit the anomaly</p> <p>Propose solutions already applied in other sectors</p>
<div>Group</div>		

D6: IMPLEMENT THE CORRECTIVE ACTIONS AND CHECK THEIR EFFECTIVENESS



Objectives:

- implement the chosen actions, ensure that they are applied
- check their effectiveness with respect to the initial problem

Process:



D6: IMPLEMENT THE CORRECTIVE ACTIONS AND CHECK THEIR EFFECTIVENESS

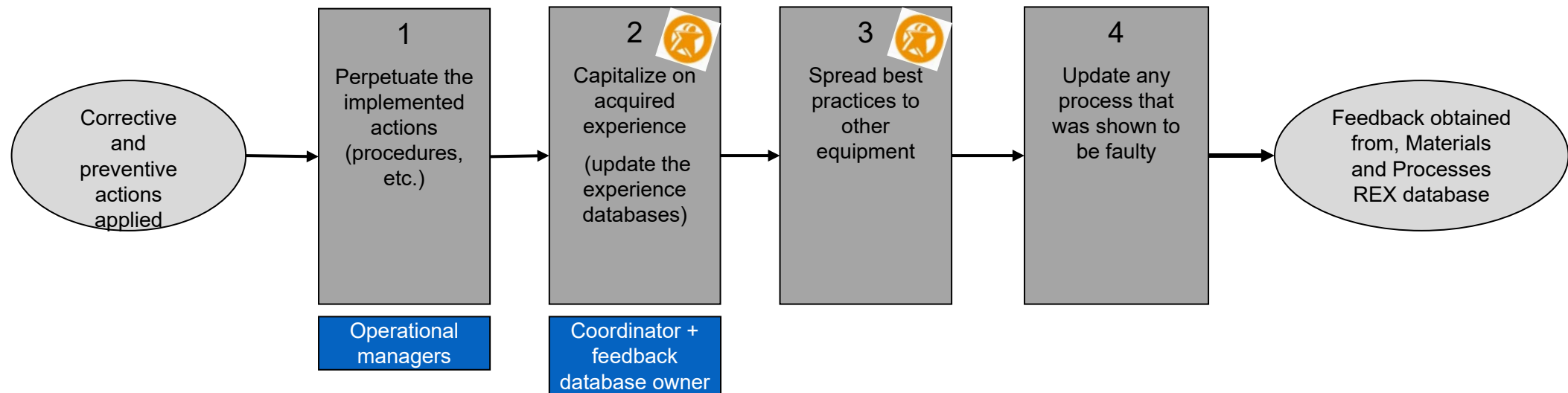
	 Standard	 HOF action(s)
<div><div>D6 - 7</div><div>Check the effectiveness of the actions</div></div>	<div>Check the effectiveness of the actions</div> <div>Ensure that they do not generate new risks</div>	<div>Observe the application and effectiveness of the corrective actions on site (observations, exchanges with the main persons concerned, photos, etc.)</div> <div>Ensure that the actions implemented are robust with respect to the HFs to correct the problem (no reoccurrence)</div> <div>Ensure that the actions implemented do not risk generating new factors contributing to the error</div>

D7: CAPITALIZE, PERPETUATE, GENERALIZE





Objectives:

- Ensure the feedback by updating existing databases and analyzing others

Process:



D7: CAPITALIZE, PERPETUATE, GENERALIZE

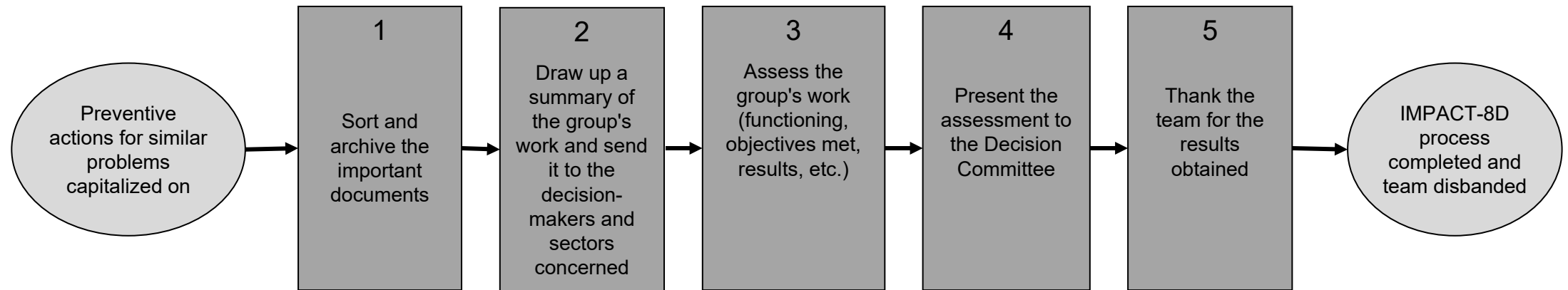
	 Standard	 HOF action(s)
D7 - 2 Capitalize on acquired experience (update the experience databases)	Update the appropriate knowledge bases to prevent the reported quality event from reoccurring	Update the catalog of HF solutions and best practices.
	 Standard	 HOF action(s)
D7 - 3 Spread best practices to other equipment	Present the main results of the investigation to all the sectors concerned	Present the feedback to the HF network Ensure that the feedback is presented to the operational teams which have identical and/or similar activities (attendance sheet mandatory) Send the feedback to the sector's Focal Point and HF Manager

D8: CLOSE THE PROCESS AND THANK THE TEAM

Objectives:

- Sort the documents and draft the summary file
- Assess what worked well and what did not work so well
- Thank the team for the results obtained

Process:



COMMUNICATION WITHIN THE COMPANY : PRACTICAL APPLICATION OF HUMAN FACTORS



Brandon D. Richards

Senior Engineer – Human Factors Engineering
GE Aviation

Bring Them Home Safely



Stay focused



**Every person, process,
and part counts**



Raise safety concerns



Hold a safety moment

- **Safety Management System**



It's OUR Job... if you see something, say something!

DEPLOYMENT AT SUPPLIERS SAFRAN AIRCRAFT ENGINES



HUMAN FACTORS

CATHERINE CATARINA-GRACA
SUPPLIER MANAGEMENT SYSTEM COORDINATOR
SAFRAN AIRCRAFT ENGINES

Methodology and Tools

Methodology

- HF Initiatives at suppliers is a main action plan for SAFRAN Aircraft Engines
- Deployment kits are available for trained SQE to deploy
- A Presentation in different languages is ready: Workshops DONE WITH top MANAGEMENT AND MANAGERS at suppliers

Tools

- PowerPoint presentation in different languages films, quizz and games
- HF guidance (leaflets – in different languages)
- Puzzle (team game)
- Goodies
- Flashdrive with all documents.



Methodology and Tools

- 1. After that first day (presentation/ animation with Top Managers / Managers;**
- 2. A Workshop to propose first action plan is organized;**
- 3. Action plan is followed on regular basis**
- 4. Workshops to analyse some quality events can be organized at suppliers plant**
- 5. Maturity in the deployment can be evaluate:**
 - 1. HF audit (in test)**
 - 2. FOD audit**

DEPLOYMENT AT SUPPLIERS

AIRBUS



EXAMPLE : SAFRAN NACELLES

Ludovic Chevet
Lead Supply Chain and Quality Manager
Propulsion Systems - POPL
Airbus SAS



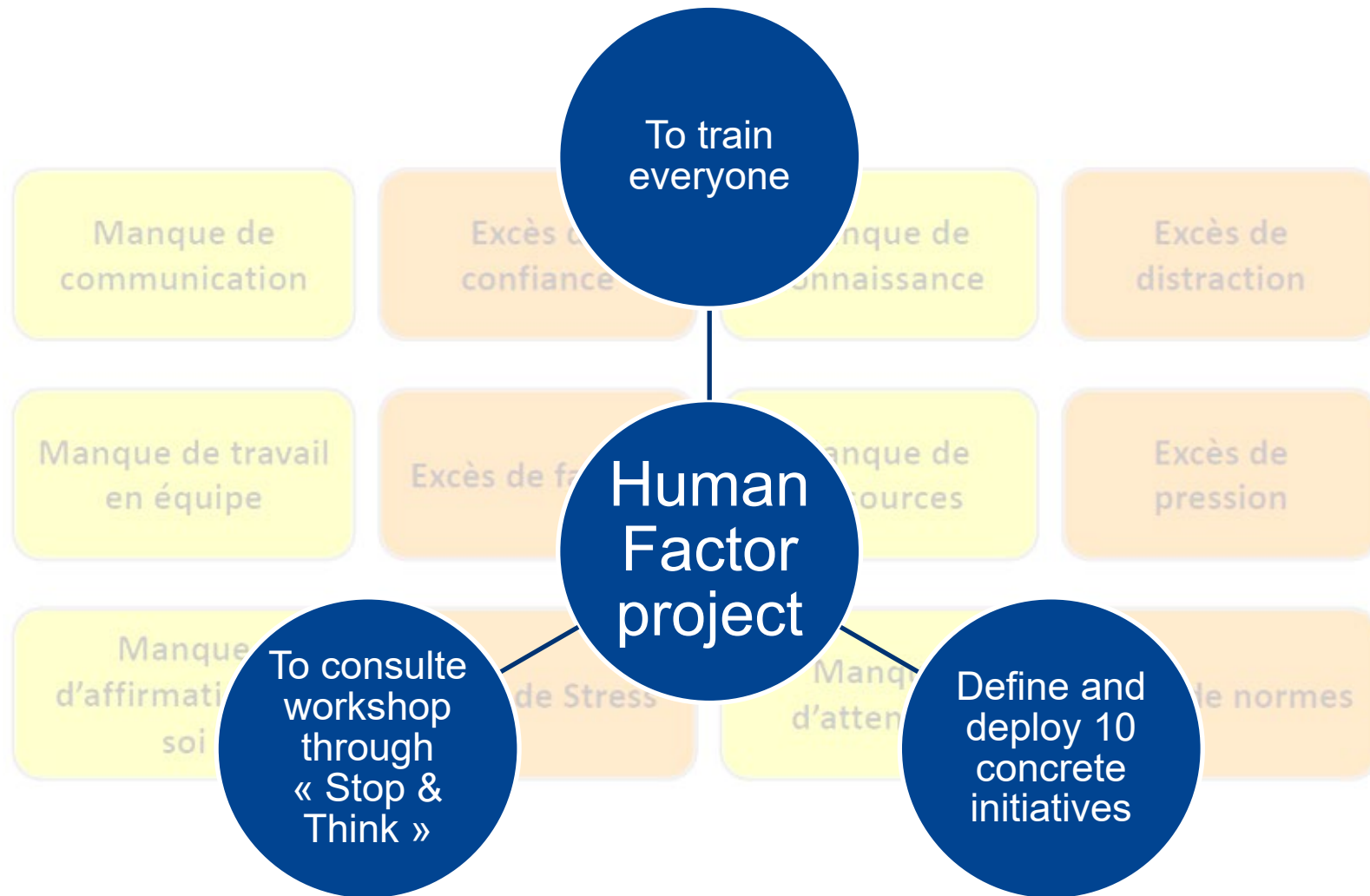
SAFRAN NACELLES COLOMIERS HUMAN FACTOR APPROACH

JAN. 12TH 2022





WHAT kind of Human Factor project to launch ?

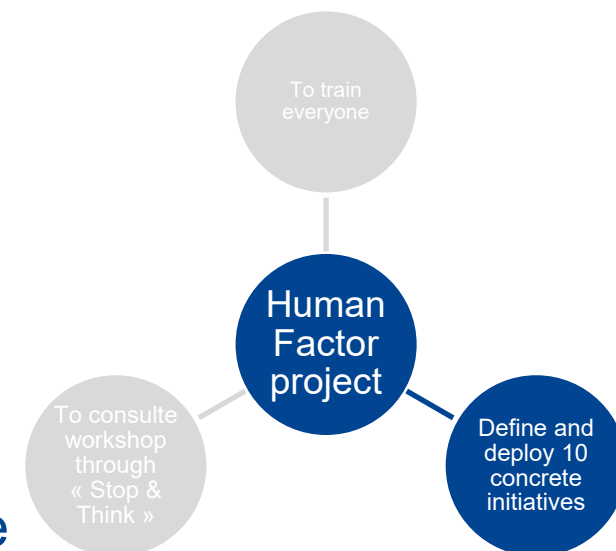


SNA Colomiers – Concrete initiatives examples

For instance :

- **Anti-Interruption white jacket to wear**
- *“Thank you for not interrupting me, sensitive operations in progress”*
- To be weared when specific operations requires specific focus
- Avoid the necessary refocusing phase after interruption and therefore the potential errors associated with resuming activity
- Already deployed at SNA – Colomiers

▪ **Act on :**

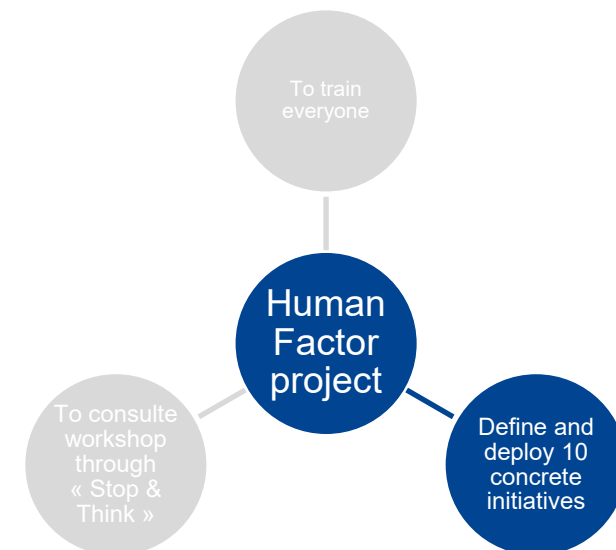
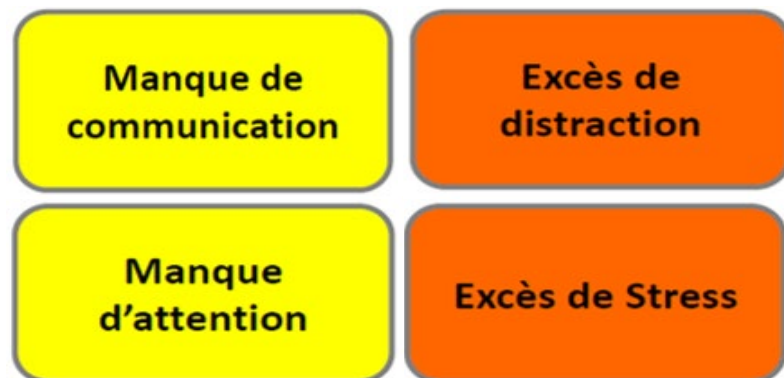


SNA Colomiers – Concrete initiatives examples

For instance :

- **Electrical powered Trolley instead of thermal powered**
- Avoid some external factors related to LEAP engine manutention with thermal powered trolley, as :
- high noise / emanations / lack of communication due to disturbance, etc. and therefore potential errors

▪ **Act on :**



SNA Colomiers – Concrete initiatives examples

For instance :

- **Clip with Flag**
- To be settled on hardware to physically identify the localisation of interruption, whatever the reason
- High visibility to avoid any FOD risk
- Flag can be written on to give information on the reason of interruption, or outstanding work to complete
- Help mechanics to recover activity after interruption

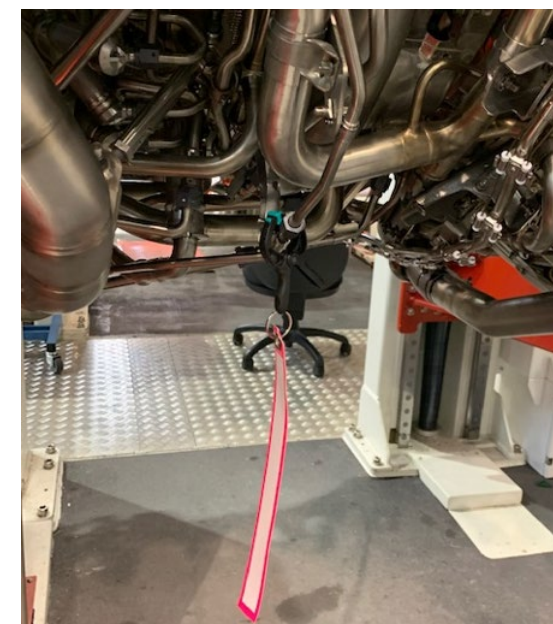
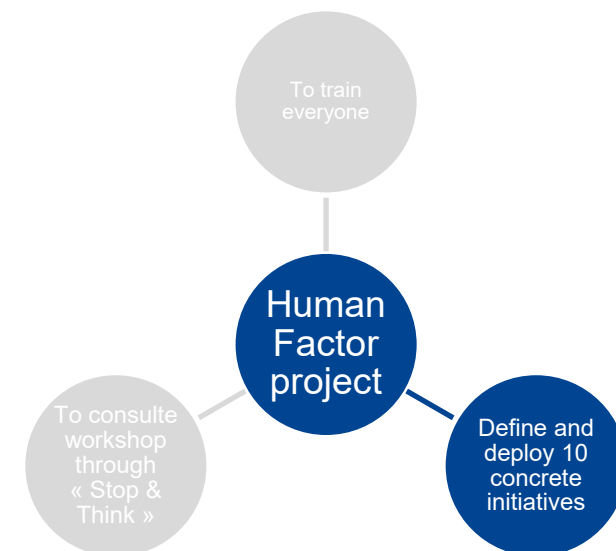
▪ **Act on :**

Manque de
communication

Manque de travail
en équipe

Manque
d'attention

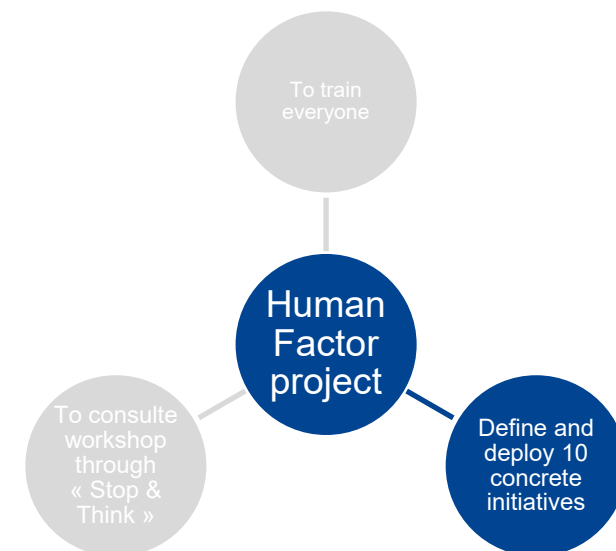
Excès de
confiance



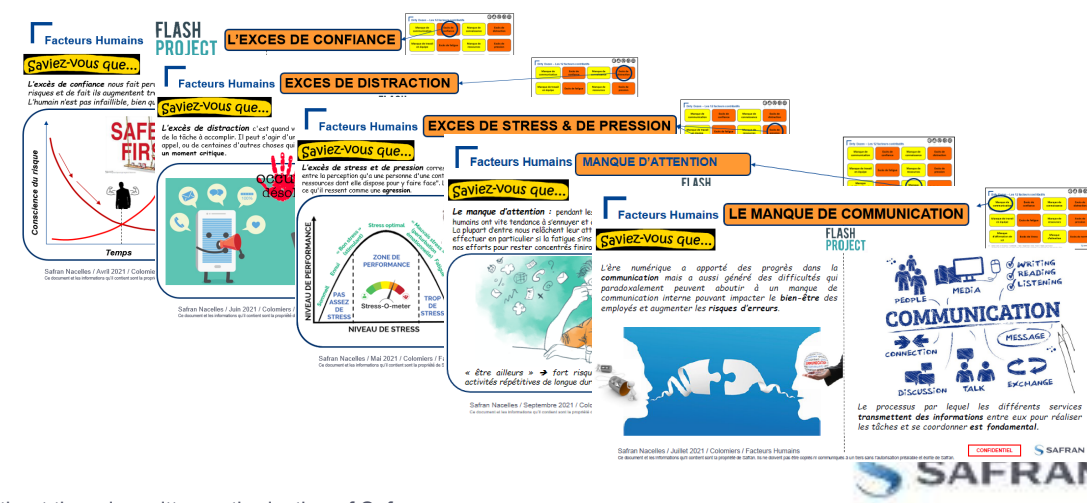
SNA Colomiers – Concrete initiatives examples

For instance :

- « Stop & Think »
- Dedicated monthly production shutdown in all sectors to lead discussion around the chosen theme of one of the Dirty Dozen.
- Prior to these session, a specific communication (Flash Project) is built and shared with all to introduce the chosen theme
- To share situation around chosen Dirty Dozen, and propose concrete solution (quick wins or long term)
- Concrete initiative by itself, as a way of training people and communicate around what the HF are.



Act on :



Q & A SESSION

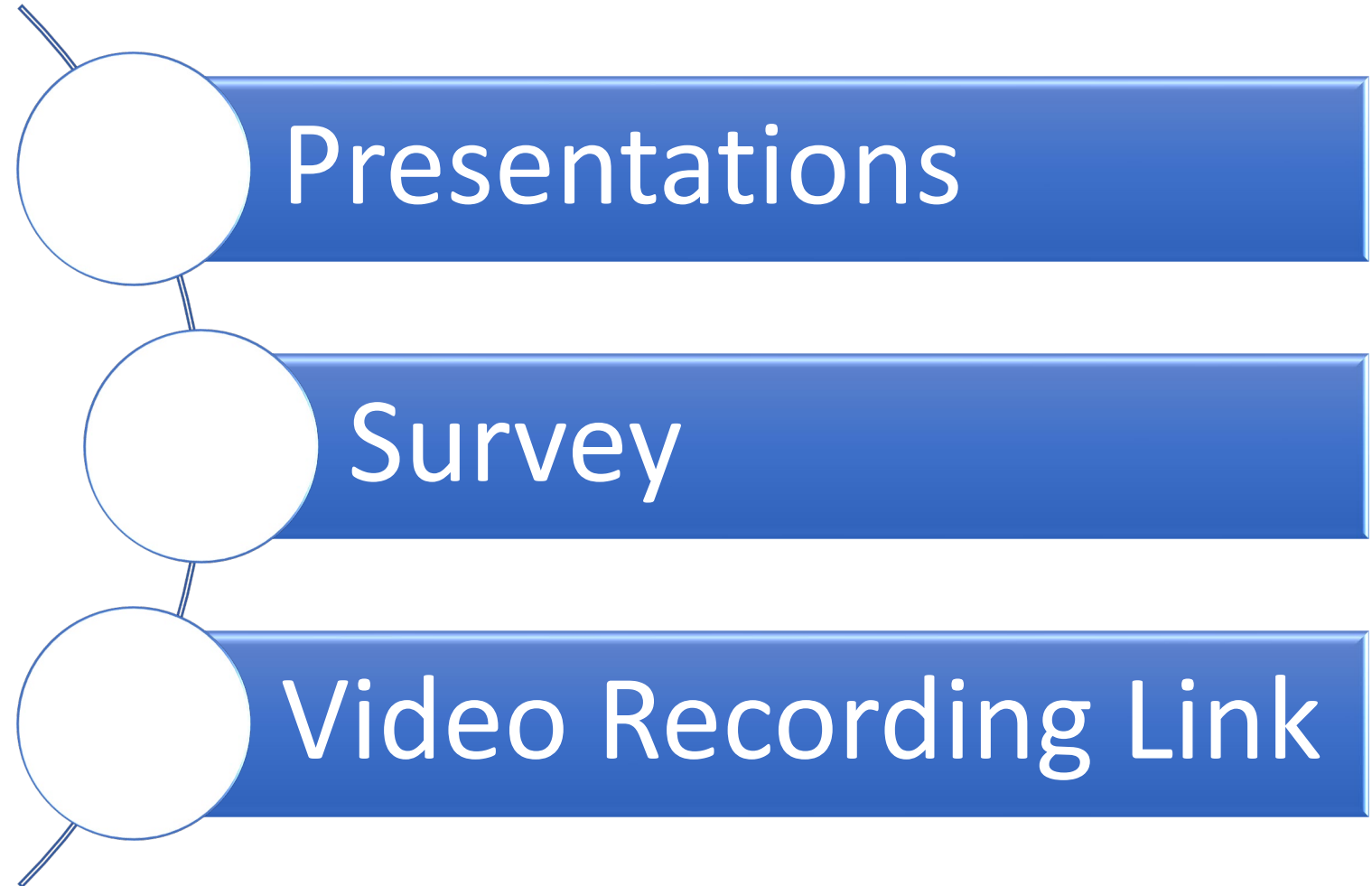
USE THE “CHAT” FUNCTION
TO ASK A QUESTION...



What are you expecting from us?

Wrap Up

These Resources will be provided to all participants in a follow-up email.





THANK YOU FOR PARTICIPATING