

RWY Safety Maturity Checklist

AHP Methodology

Runway Safety Checklist Rationale

- Translate risk information from model into something tangible
- Cross industry tool catering for all levels of maturity
- Simple to use (and easy to translate into other languages)
- Minimal training required for use
- Help identify and prioritise actions to drive improvement in runway safety performance
- Cost effective in resource and time to use
- Provide a suitable record for assurance purposes and benchmarking
- Accepted by all segments of aviation industry as credible and valuable
- To provide a means for agencies to develop future requirements to improve runway safety consistent with best practice

Caveats

- All weightings are at the discretion of the agency
- Financial cost currently only considers implementation cost for the agency
- True cost may need to be considered before final decision is made i.e. efficiency, capacity, fuel burn, time/schedule etc
- Safety benefit is an approximation only, and should be confirmed in consultation with airlines
- Every cell value should have the reasoning recorded to support the rationale for the derived value.
- Financial Cost should be considered separately so that it doesn't unduly influence (or dilute) the safety benefit (ALARP)
- A generic reference is required to enable benchmarking

The Analytic Hierarchy Process (AHP)

- AHP is a structured technique for making complex decisions, based upon psychological and mathematical principles
- Developed in the 1970s
- AHP decomposes decision problem into a hierarchy of more easily comprehended sub-problems (criteria)
- Criteria can relate to any aspect of the problem – tangible or intangible
- Once hierarchy is built options are systematically evaluated and combined to produce 'local' and 'global' ranking of elements
- Evaluation by pairwise comparison
 - e.g. option A vs option B, option A vs option C, etc ...

The Analytic Hierarchy Process Simple Example



Tom

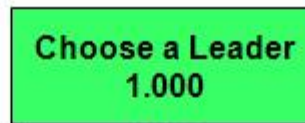


Dick



Harry

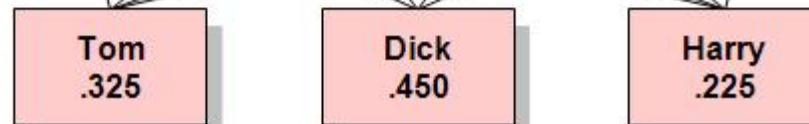
Goal:



Criteria:



Alternatives:



The Weighting Criteria

- The weighting criteria are used to judge every element in the checklist;
- Not all criteria are considered to have equal importance;
- They are the first to be weighted against each other;
- The elements are then weighted against each criterion;
- The criteria are the same for all stakeholders;
- The elements are not, i.e. they are stakeholder-specific.

The five criteria

- **Safety Benefit:**
 - Safety benefit of Element includes scope for reduction of likelihood and/or consequence of outcome.
- **Complexity:**
 - Procedural and Technological complexity, maturity of solution, degree of development involved, implementation difficulty, clarity of requirements.
- **Stakeholder Impact:**
 - Impact of solution (internal & external), workload impacts, involvement required, sensitivity, training impact.
- **Financial Impact:**
 - Estimated cost of implementation of Element for agency.
- **Dependencies:**
 - Degree of dependency of this change on other Elements, and other Elements' changes on this.

Weighting tool

- A simple to use, web-based tool;
- Calculates all values automatically;
- Can have an unlimited number of participants;
- Can be used at any time, from any location, in repeated sessions;
- Results are saved automatically;
- It contains three parts:
 - Survey – designed to collect details, best practice, methods, ideas;
 - Criteria weighting – will weigh the five criteria using pairwise comparison method;
 - Element prioritisation – will weight the elements against each criterion as a list.

Welcome screen

Evaluate Project («RWY Saf CANSO») — Comparison Suite - Windows Internet Explorer


http://core.expertchoice.com/Comparison.aspx#Project/Evaluate/Default.aspx?resetproject=

Expert Choice **comparison** SUITE **Workgroup:** Eurocontrol **Project:** RWY Saf CANSO Radu Cioponea Resource Center ? Logout

Structure Measure Synthesize Allocate Iterate Reports

Welcome to the Runway Safety Maturity Checklist!

Please click 'Next' to answer a series of questions.

If you need help, click the help icon  near the top right of the screen.

After completing the task on a page, you simply need to click 'Next' to continue. You may be alerted along the way of specific things to keep in mind.

Navigation Box

Steps: 1 2 3 4 5 6 7 8 9 ... 25 Evaluated: 6/142

Next Unassessed

Previous Next

English Project status: Available and online Version: 5.0.9

Click on the "Next" button.

Survey screen

Element:

Agreement between ATC and Meteorological office to notify ATC of changing weather conditions

Element to be described

Objective:

ATC receives accurate and timely weather information where PIREPs are not provided or meteorological conditions are different from the ATIS.

Objective for the element

- * 10. Do you meet the **objectives** of the **element**?
Practice (technique), not necessarily written down.
Please give details below

Survey question

No

Drop-down answers

11. Details

Some details of the practice here

Free text for details

- * 12. Does the **element** exist?
Is it written down (e.g. procedure)?
Does it exist (e.g. equipment, signs, markings etc)?
Please give details below

Yes

- 13.

Yes
No
Don't know

- * 14. **Training**
Are people trained in the use of the **element**?
Remedial and/or Refresher training?
Please give details below

Don't know

Previous

Next

Weighting screen

The screenshot shows a weighting interface for the RWY Safety Maturity Index. At the top, a grey bar contains the goal question: "With respect to RWY Safety Maturity Index which of the two Objectives below is more important". Below this, a text box defines the goal: "Improve the RWY safety performance through strengthening the risk controls (e.g. precursors, barriers etc.)".

In the center, a bar chart displays two items to be weighed: "Stakeholder Impact" (left, blue box) and "Dependencies" (right, orange box). The chart uses a 11-point scale from "Extremely Very strongly" to "Extremely Very strongly", with "Equal" in the middle. A callout points to the bars with the text "Click on any of the bars here".

Below the chart, two text boxes provide definitions for the items: "Stakeholder Impact" (Impact of solution (Internal & external), workload impacts, involvement required, sensitivity, training impact.) and "Dependencies" (Estimated cost of implementation of Element for agency). A callout points to these boxes with the text "Definitions".

At the bottom, a "Navigation Box" shows a sequence of steps from 1 to 25, with step 8 highlighted. It also includes an "Evaluated: 5/142" counter, an "Auto advance" checkbox, and "Previous", "Next", and "Next Unassessed" buttons.

Callouts are placed over the image to highlight key elements:

- Goal question**: Points to the top grey bar.
- Items to weigh against the goal**: Points to the "Stakeholder Impact" and "Dependencies" boxes.
- Weighting scale**: Points to the central bar chart.
- Click on any of the bars here**: Points to the bars in the chart.
- Definitions**: Points to the text boxes below the chart.

Alternatives screen

Rate Alternatives with respect to **Safety Benefit**

Safety Benefit
 ATC supervisor and controller roles...
 ATC supervisor... WRT Safety Benefit

Safety benefit of **Element** includes scope for reduction of likelihood and/ or consequence of outcome.

List of elements to be rated

Element Description	Rating	Percentage
ATC procedures to ensure that ATIS is updated in a timely manner and the action is recorded and/or directly broadcasted	Good to Very Good	56%
Agreement between ATC and Meteorological office to notify ATC of changing weather conditions	Excellent	86%
ATC procedures for provision of timely, accurate and clear instructions to Flight Crew (see description for more)	Moderate	26%
ATC flow control procedures manage ATC capacity to ensure provision of track and distance information allowing for prevailing meteorological conditions	Very Good	69%
ATC supervisor and controller roles and responsibilities require monitoring of controller environment, workload, distractions, and internal or external pressures are not influential.	Not rated	
ATC procedures for late notice runway changes (please see description for more)	Not rated	
ATC procedures to obtain and review aircraft performance guidance material and SOP's in consultation with Airlines.	Not rated	
ATC procedures require: (please see description)	Not rated	

Click anywhere here to rate

Intensity Name	Priority
Not rated	
Outstanding	100%
Excellent	86%
Very Good	69%
Good to Very Good	56%
Good	47%
Moderate to Good	36%
Moderate	26%
A Tad	4%

Navigation Box

Steps: 1 ... 11 12 13 14 15 16 17 ... 25 Evaluated: 5/142

In practical terms

- You'll receive an invitation to join by email;
- Please check your spam filter if nothing has arrived;
- The email has a link (may not be active, depending on email application);
- Please click on it or copy&paste in a browser (ideally IE or Chrome, works with Firefox but not very well);
- Each email/link is strictly individual, please do not share;
- You may exit and return at any time, simply click again on the same link and you'll continue from where you left it;
- Should you have any questions, please call us or email at radu.cioponea@eurocontrol.int or antonio.licu@eurocontrol.int
- The exercise will remain active for a week from the launch, during which you can access it as many times as necessary.
- Past the deadline, the link becomes inactive.