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

Goal:
Choose a Leader 1.000

Criteria:
- Age .300
- Experience .400
- Education .100
- Charisma .200

Alternatives:
- Tom .325
- Dick .450
- Harry .225
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 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.

Click on the “Next” button.
**Element:**
Agreement between ATC and Meteorological office to notify ATC of changing weather conditions

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

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

  - [ ] No
  - [ ] Clear

11. Details
  - Some details of the practice here

*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
  - [ ] No
  - [ ] Don't know

*13. [Select option]

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

  - [ ] Don't know
Weighting screen

- Goal question
- Items to weigh against the goal
- Weighting scale
- Definitions
- Click on any of the bars here
# Alternatives screen

## Rate Alternatives with respect to Safety Benefit

<table>
<thead>
<tr>
<th>Element</th>
<th>Good to Very Good</th>
<th>Excellent</th>
<th>Moderate</th>
<th>Very Good</th>
<th>Not rated</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATC procedures to ensure that ATIS is updated in a timely manner and the action is recorded and/or directly broadcasted</td>
<td>56%</td>
<td>86%</td>
<td>26%</td>
<td>69%</td>
<td>56%</td>
</tr>
<tr>
<td>Agreement between ATC and Meteorological office to notify ATC of changing weather conditions</td>
<td>Excellent</td>
<td>86%</td>
<td>56%</td>
<td>36%</td>
<td>26%</td>
</tr>
<tr>
<td>ATC procedures for provision of timely, accurate and clear instructions to Flight Crew (see description for more)</td>
<td>Moderate</td>
<td>26%</td>
<td>47%</td>
<td>36%</td>
<td>26%</td>
</tr>
<tr>
<td>ATC flow control procedures manage ATC capacity to ensure provision of track and distance information allowing for prevailing meteorological conditions</td>
<td>Very Good</td>
<td>69%</td>
<td>47%</td>
<td>36%</td>
<td>26%</td>
</tr>
<tr>
<td>ATC supervisor and controller roles and responsibilities require monitoring of controller environment, workload, distractions, and internal or external pressures are not influential.</td>
<td>Not rated</td>
<td>26%</td>
<td>47%</td>
<td>36%</td>
<td>26%</td>
</tr>
<tr>
<td>ATC procedures for late notice runway changes (please see description for more)</td>
<td>Not rated</td>
<td>26%</td>
<td>47%</td>
<td>36%</td>
<td>26%</td>
</tr>
<tr>
<td>ATC procedures to obtain and review aircraft performance guidance material and SOP's in consultation with Airlines.</td>
<td>Not rated</td>
<td>26%</td>
<td>47%</td>
<td>36%</td>
<td>26%</td>
</tr>
<tr>
<td>ATC procedures require: (please see description)</td>
<td>Not rated</td>
<td>26%</td>
<td>47%</td>
<td>36%</td>
<td>26%</td>
</tr>
</tbody>
</table>

**Criterion to rank against**

**List of elements to be rated**

**Click anywhere here to rate**
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.