Safety Benefits Management Workshop

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Objectives for the Afternoon

- Explore the role safety benefits management can play in planning operational improvements.
- Identify when to use safety benefit management.
- Practice benefit estimation and assessment methods with examples.
- Understand limitations of current methods

Agenda

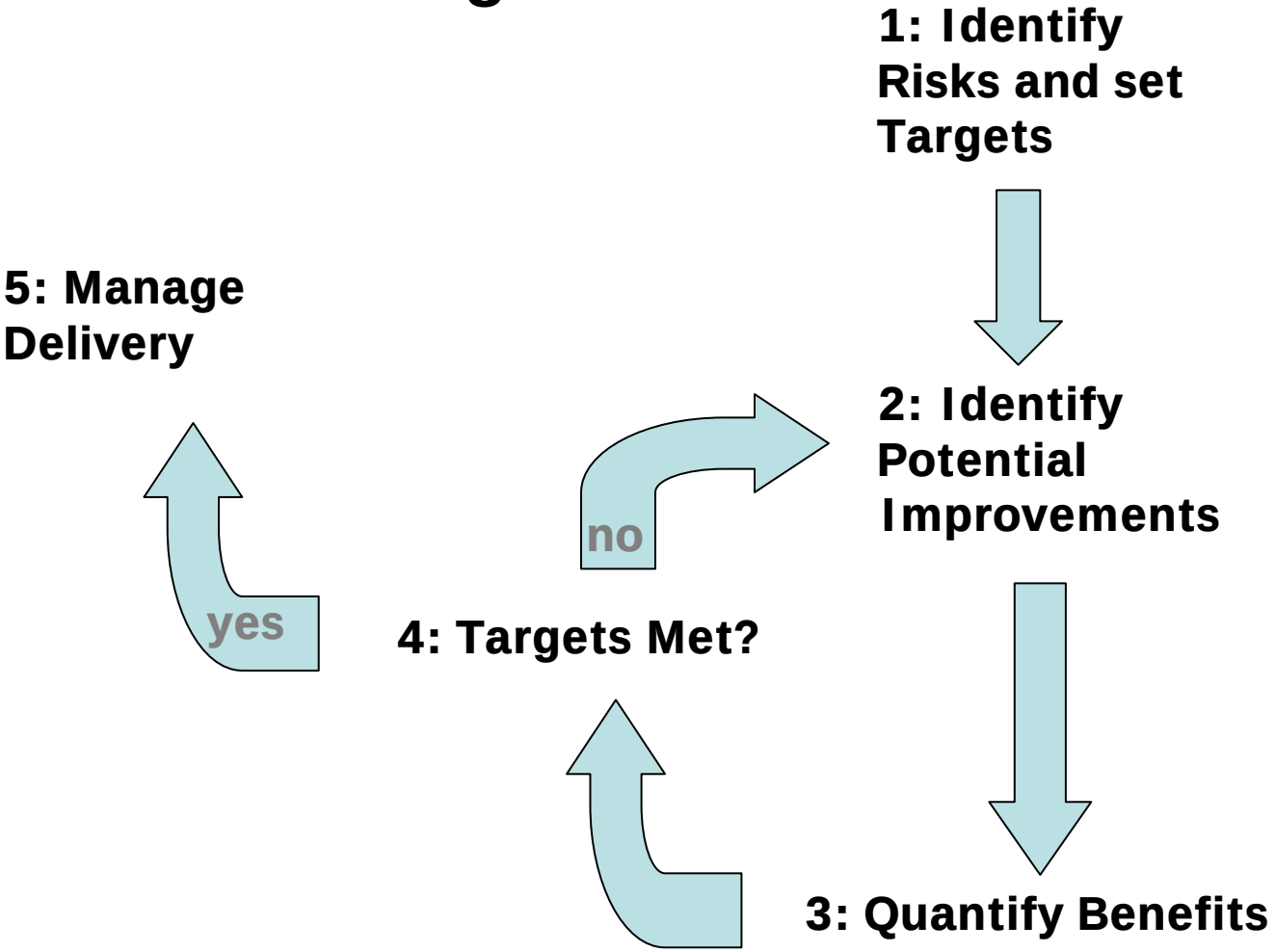
Time	Item
1300-1305	Introductions
1305-1330	Safety Benefit Management (Presentation)
1330-1500	Group Exercises
1500-1530	Coffee
1530-1645	Group Exercises
1650-1700	Summary & Feedback

Safety Benefits Management

The Need for Safety Benefit Management

- Current ATM operations are very safe, but there is still a real risk of ATM related accidents.
- Safety performance needs to improve to support changing demands on the ATM system.
- The SESAR operational concept aims to deliver significant safety benefits but:
  - Risks vary across the different elements of existing operations.
  - Need to identify appropriate safety improvements and sequence of implementation for each operation.

The Elements of Safety Benefit Management



Identifying Risks

- Incident Data
- Causal Factors
- Incident/accident investigations
- Day-to-day observations
- Pilot / Controller open reports
- Expert Judgement

Objective is to identify risk areas and seek to quantify contributions to overall risk in the operation – not necessarily to quantify the risk itself

Identify Improvement Actions

- Identify potential benefits from existing changes
  - Airspace changes
  - New ATC systems
- Identify new improvement actions
  - Using expert work groups
  - Comparison with other similar airspace

Quantify Benefits - Metrics

- Accidents - Runway collision
- Incidents - Runway incursion
- Causal Factors - Communication error
- Exposure to Risk - Runway crossing
- Incident Severity – Pilot situational awareness
- Error Resilience – Procedures

Accidents and Incidents are difficult to measure or assess without modelling

Quantify Benefits - Methods

- Two stages
  - Initial estimate of likely benefits
  - More detailed assessment
- Risk models
  - Causal factors
  - Fault/event trees
- Expert judgement
  - Facilitated workshops
  - Incorporates data as necessary

Typically a mix of risk models and expert judgement can be used
– benefits do not need to be quantified as accurately as risks

Managing Delivery

- Safety Benefits treated like any other project requirement
- Monitor and confirm delivery through project life cycle

Monitoring during development and assessment during operation can be undertaken using similar techniques to those used for benefit assessment

Results - EXAMPLE

FIGURE 1: Monthly Twelve Month Rolling Total Risk Index vs Prospero Predictions for NERL

Limitations of the approach

- Ideally safety performance data is required
  - But approach can work based just on expert judgement.
- Accuracy of estimates is limited
- Accounting for external factors (e.g. traffic changes) can be difficult.
- New risks can emerge unexpectedly
- Cannot trade benefits against risks unless analysis is to the same standard.

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Group Exercise

Group Exercise

- 3 Groups – nominate facilitator

- **Identify Risk**: Runway Safety is a key risk faced by all ANSPs
- **Identify Improvement Actions**: Top 3
- **Estimate Benefits**: Using Mock Data
- **Assess Benefits**: Explore concept using your own Runway Incursions
- **Brainstorm**: Safety benefits without data

Group Exercise Notes

- Mock Airport Runway Safety Data
- Meant for illustrations purposes only
- Metric for Safety Risk is used
- Assumptions will need to be made
- You can relate back to a similar airport operation in your ANSP

Runway Safety: Identify Improvement Actions

Group Exercise

Runway Safety: Identify Improvement Actions

- Identify 3 safety improvement actions that you believe will reduce the risk at the airport

- 20 mins

Runway Safety: Estimate Safety Benefit

Group Exercise

Runway Safety: Estimate Safety Benefit

- Which areas of risk does each improvement action impact (pilot, driver, ATCO)?
- Which Causal Factor(s) does each improvement action impact?
- Using your expert judgement how much risk reduction (benefit) will each improvement action achieve?
- 30mins

Present Results Back

- 5mins each group presents back
- 5 mins questions

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Coffee

30mins

Runway Safety: Assessment of Safety Benefit

Group Exercise

Runway Safety: Assessment of Safety Benefit

- Explore methodology for a more detailed assessment of risk
- Assumes incident data is severity classified in terms of collision risk
- Utilise and discuss your own runway incursion incidents

Runway Safety: Assess Safety Benefit

- For an incident report, if the safety improvements were implemented, determine whether the incident would have been **prevented or potentially prevented**
- Assign confidence – if incident happened 10 times, how many times would it have been prevented, e.g. pilot crossing hold point prevented 7 times out of 10 because stop bars in place
- **30mins**

Safety Benefits Management without Incident Data

Group Exercise

Safety Benefits without incident data

- Brainstorm how an ANSP could apply the safety benefit concept without the use of incident data (or if incident data is limited)

- 10mins

Present Results Back

- 5mins each group presents back

Summary

- Introduced Safety Benefits Management
- Practiced parts of the process
  - **Identify Risks**: Runway Safety is a key risk faced by all ANSPs
  - **Identify Improvement Actions**: Top 3
  - **Estimate Benefits**: Using Mock Data
  - **Assess Benefits**: Explore concept using your own Runway Incursions
- Brainstormed how it might work with no/limited safety data
- Maturing process

Feedback & Questions

- Feedback
- Questions