



SAA

Introduction

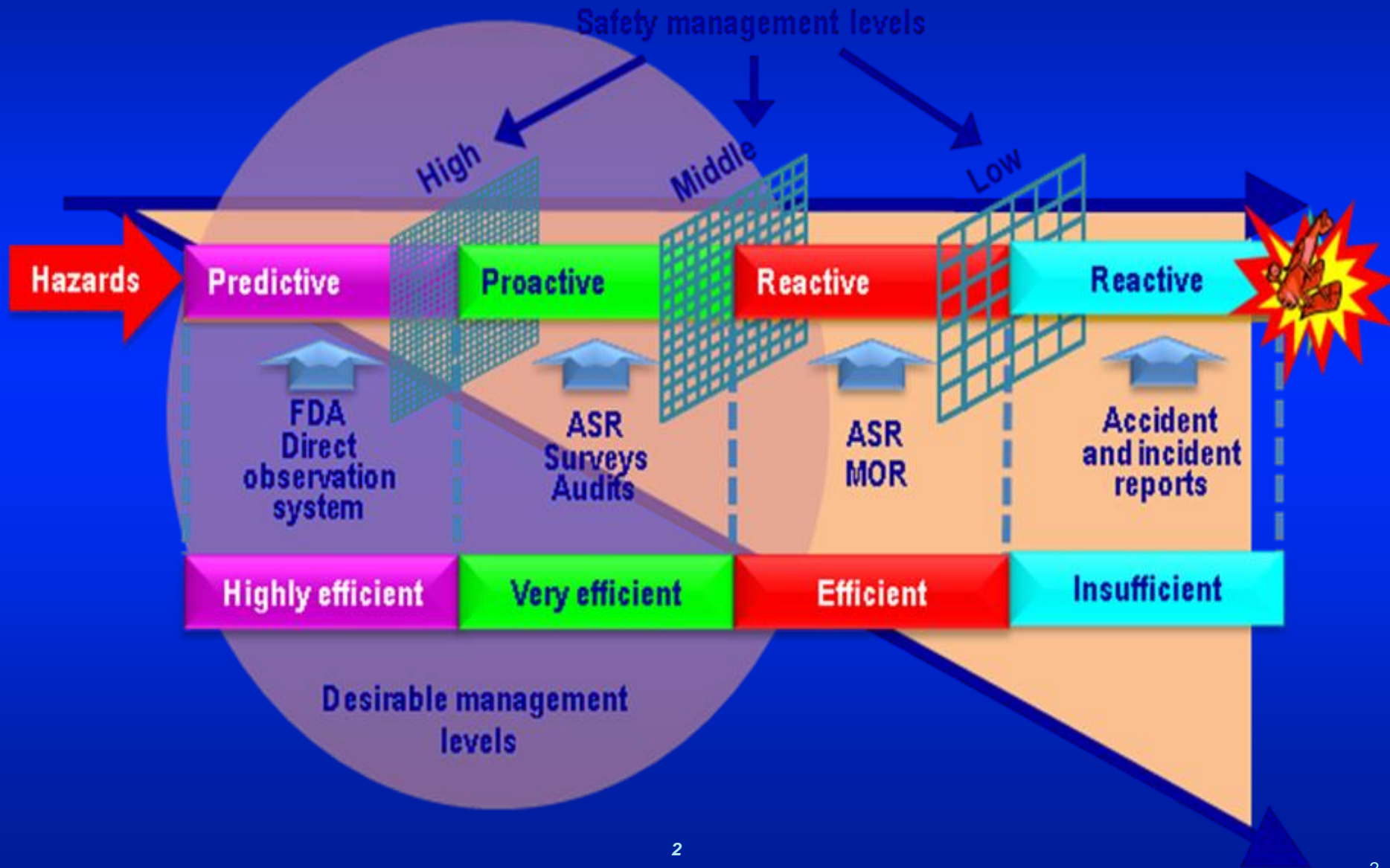
Singapore Aviation Safety Seminar 2019

Flight Safety Foundation – Singapore Aviation Academy

Session XII – Role of Accident Investigation and areas of special interest

Presented by Caj Frostell

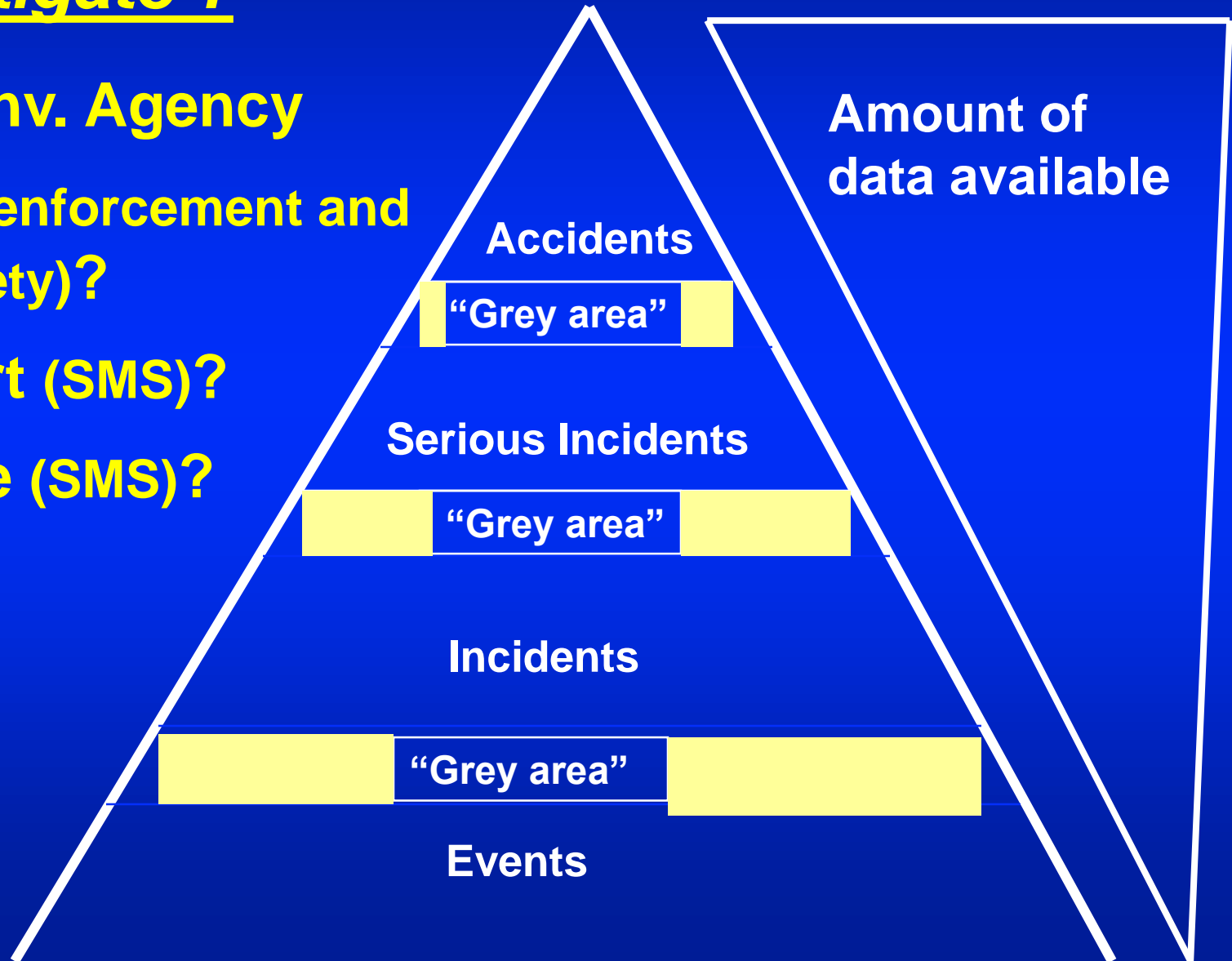
Hazard identification methods



Who should investigate ?

Reactive investigations

Acc. Inv. Agency
CAA (enforcement and / or safety)?
Airport (SMS)?
Airline (SMS)?



Formal (Annex 13) Accident Investigations by an Aircraft Accident Investigation Agency

- The investigations usually determine the ***safety deficiencies and hazards*** (quite well)
- The ***formulation of safety recommendations*** (could be improved, in order to improve implementation)
 - ✓ Requires cooperation (separation, not isolation)
- ***Implementation of recommendations*** (could be improved)
 - ✓ “***Nobody was fatally injured, why do we need to implement something that costs 2 million ?***”
 - ✓ ***Technical issues “easier to implement” than operational issues (?)***

Safety improvements

- A number of *significant improvements have been made over the years*
 - ✓ Some improvements have been quick and timely
 - ✓ Some improvements take a long time to implement
 - ✓ (Examples: security, unruly pax, drones, fire resistant material, non-toxic materials, dangerous goods – hazardous cargo, 16 g seats; how about restraint systems and child restraints ?

Serious incident investigations

- Now a requirement in Annex 13
- Not particularly well implemented, on a systematic basis
 - ✓ Lack of *notification*
 - ✓ Lack of *resources* (safety studies, GA events?)
 - ✓ Lack of perceived *importance*
 - ✓ “*Subjectivity*” in the *classifications of “serious incident”* (considerable differences from country to country)

Note.- With fewer major accidents, could serious incidents be more widely investigated ?

Accident – incident classification

- ICAO Annex 13 – Attachment C - List of examples of serious incidents
- From Nov 2010, ICAO Annex 13 – Attachment E - Guidance for the determination of aircraft damage (and whether it is an accident)

Note.- Good effort but does it solve the challenge of classification of occurrences as accidents, serious incidents and incidents ?



China Cargo Airlines B777F

Tail strike in CPH on 17 April 2011

Is this a reportable occurrence ?

***Is this an accident, serious incident
or incident ?***

Ethiopian MD-11F on 1 Sept 2013 in South Africa

Is this a reportable occurrence ?

***Is this an accident, serious incident
or incident ?***



Hail damage

Is this a reportable occurrence ?

Is this an accident, serious incident or incident ?



Why do some investigations take a very long time ?

The “normal” and obvious answers are:

- It is a very complex investigation
- Lack of resources
- Other business interfered

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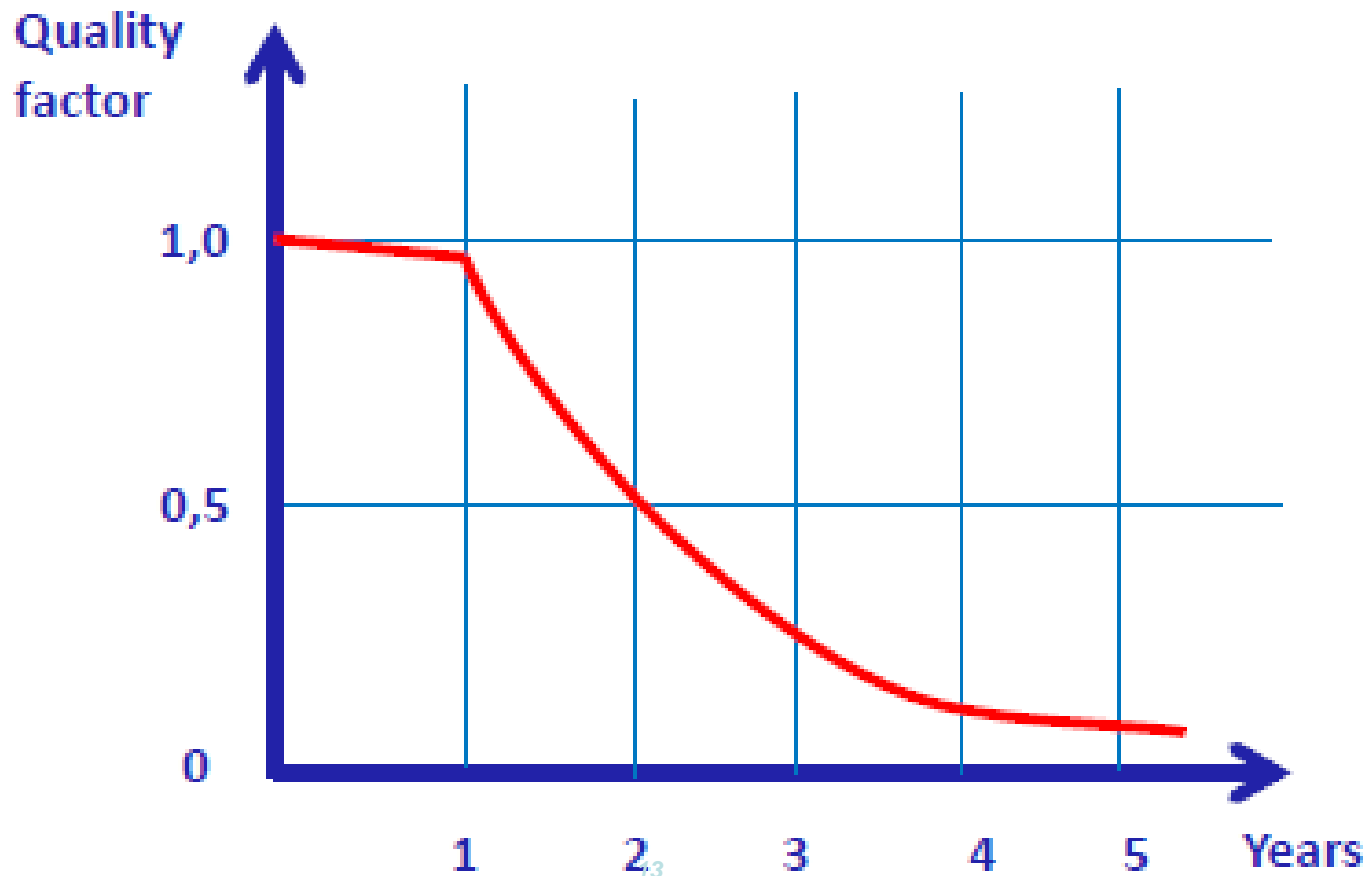
- It is a very complex investigation
- Lack of resources
- Other business interfered

It is “rare” to hear (from the inv. Agency):

- Lack of planning
- Lack of effective management
- Lack of active decision-making
- Lack of follow-up actions

Management objective: Publish the final report within one year

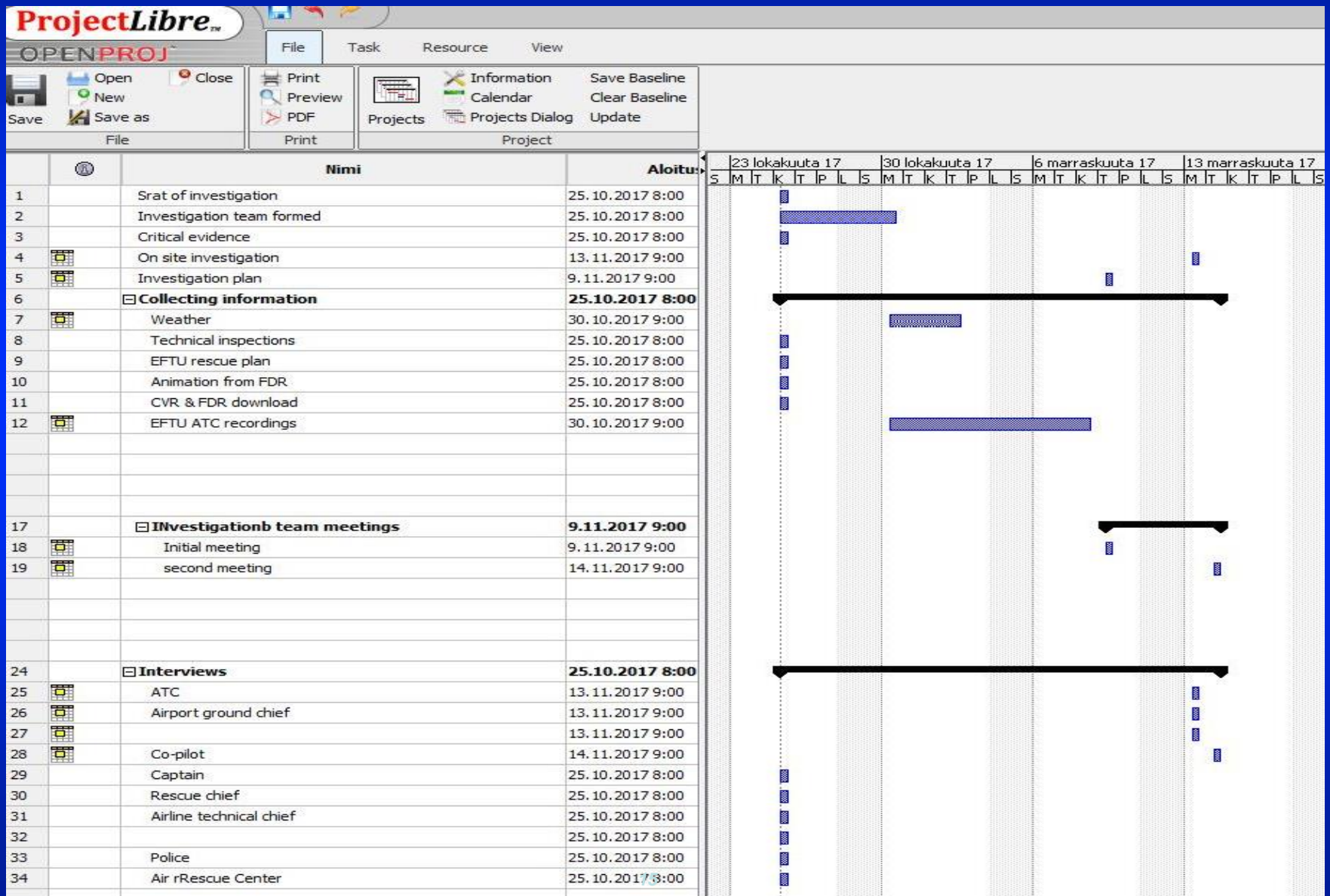
Quality vs investigation time



Initial management meeting

- In the first week (**soonest**) after an occurrence
- All available investigators
- **Brainstorming** – discuss possible investigation activities (and alternatives, and pros and cons) – determine the **“significant events”**
- Evaluation of activities
- Decisions and **“project plan”**

Project plan



Agency investigation management

- **Initial “management” meeting (project plan)**
- **Weekly follow-up meetings - investigation team**
- **Monthly follow-up of on-going investigations with the agency management; consideration of investigator workloads, resources and adherence to the planned time-table**
- **Firm adherence to deadlines in order to complete final reports within envisaged time frames**
- **Table-top exercises (in-house)**

Agency tools required

- Management process *details in the Policy & Procedures Manual*
- *Training* of investigators (table-top exercises)
- Develop and adopt a *useful method for planning and follow-up actions* in an investigation
- *“Active”* management decisions on the *scope of the investigation – Project plan*
- *“Prepared” and “balanced” management decisions*

Evaluation of activities

- *What is the purpose* or question ?
- *Possible findings ?*
- *Is it a task for the investigation agency* or for the regulatory authority (CAA) ?
- *Why is it necessary ?*
- What *priority* does this activity have ?

Planning and decisions:

- Who will perform the activity ?
- How should it be done ?
- Where should it be done ?
- *When will (should) it be ready/finalized ?*

Investigation plan

- Decision on the activities to be included
- Include an estimate of man-hours
- An estimate of costs
- **Completion date**
- **Time frame with milestones** (as normal project management in any industry)

***Note: - Without an investigation plan
We do not know when we will be finished***

Investigation plan

Dates for milestones to be included:

- Facts gathered/obtained
- ***Factual information meeting*** (ref. technical review meeting)
- Analysis, findings, causes, safety recs – progress meeting
- First draft to chairman and team members
- Draft for internal comments
- Translation of draft (if required)
- Draft for external comments
- Publishing / release of final report

Factual information meeting (technical review meeting)

- When the factual information has been gathered/obtained
- *All stakeholders are invited*
- *Presentation of facts*
- *Stakeholders have the opportunity to comment* on facts (false facts, additional facts, etc)
- This meeting shall ensure that the *analysis is performed based on “correct” (and agreed) facts*
- The result will be *less adverse comments on the draft final report*

Monthly follow-up (by management)

- All IICs will give an oral as well as a short written progress report on all on-going investigations
- *Is the planned investigation time frame accurate ?*
- Is there a need for more (or other) resources ?
- The follow-up meeting provides an overview on the agency's workload and upcoming costs

Possible actions by the management:

- *Take measures to get a delayed/lagging investigation back on track*
- Allocate more resources
- Prioritize
- Synchronization with agency admin

Dare to finish !

- When all reasonable investigation activities are done
- Close the “field” investigation, write the report (the investigators are perfectionists)
- Even if no conclusive causes are found

If we have identified an aircraft malfunction:

- Is it an *investigation agency task* to establish the deeper logic behind a malfunction ?
- Or to find *the solution to fix a problem* ?
- The above may sometimes be *a task for the operator or the manufacturer supervised / overseen by the certifying authority* (CAA, FAA, EASA, etc)

Investigation quality follow-up

(3 months after publishing the report)

- Two parts: (1) *the investigation process*, and (2) the *formulation of findings, causes, safety recommendations* and the layout of the report
- Investigation team, and one “independent” investigator
- Review of the investigation process and the report
- *What was good and not so good ?*
- *What should we have done differently ?*
- Was the allocated time frame reasonable ?
- Was the costs reasonable ?

Annual agency quality follow-up

(analysis of all investigation quality follow-ups)

- *Trends*
- Successful procedures
- Common mistakes
- Lessons learned
- *Need for changes to governing (policy & procedures) documents*

*[Ref. Accident Investigation Agency -
“Quality Assurance”]*

Investigation time frame

- 8 January Accident
- 9-11 January Accident site and recovery
- 13 January FDR/CVR readout
- 9 March Status report published
- 22 March Simulator session
- 14 May Progress meeting in Montreal
- 14 September Factual information meeting
- 24 October Draft report for comments
- 12 December Publishing of report **(11 months)**
- More than 20 progress meetings with the team

Planned at
start-up:
9 December

Quality of the “example” investigation ?

*Based on comments from the accredited
representatives and advisers:*

- *No negative comments on the scope of the
investigation*
- Very few and *minor comments on the
findings and causes*
- Many *positive comments on the cooperation
and the effectiveness of the investigation*
and the investigation team

***No incident report – no investigation – no fix ---
that is an “accident” waiting to happen !***



Questions? Thank you