“Weak Signals”

Lisboa

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Before I start …

- The more the conference advances the **„adaptation pressure“** increases

The view from behind

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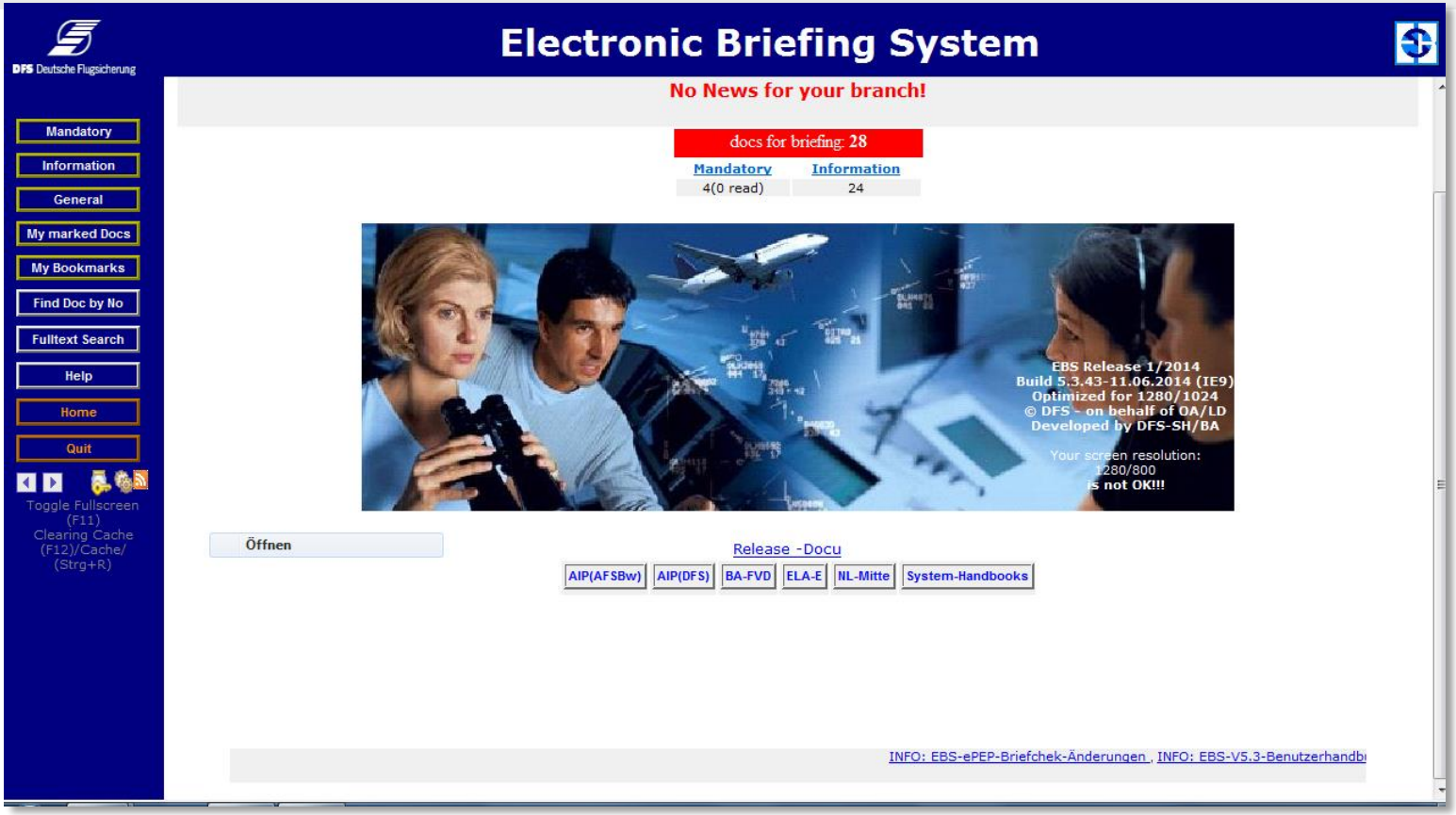
How we adapted …

No „presenting zone“

Examples being used during the conference



Introduction

"The future seems implausible, the past incredible"

(Woods & Cook, 2002)

The Weak Signals project

- Project together with EUROCONTROL and TU Darmstadt
- Results will be made accessible via SKYbrary
- PREZI presentations

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Work Breakdown

WP 1	Scoping and Framework Definition
WP 2	Testing and Validation
WP 3	Communication, Training and Awareness

Traditional Approach

- Use of after-the-event data to achieve an understanding about the organisation's safety level
- Safety is usually seen as the absence of unwanted consequences. The counteractions are therefore reactive and often influenced by hindsight
- Managing safety is seen as the avoidance or elimination of negative outcomes
- Organisations with this understanding may learn from past events, but hardly proactively anticipate future threats

Characteristics of „Weak Signals“

- Low visibility
- Ambiguous, non-obvious
- Little or no familiarity
- Apparently low value
- Low apparent relevance and reliability
- Low palpability

Working Definition „Weak Signals“

“A seemingly random or disconnected piece of information that at first appears to be background noise but can be recognized as part of a significant pattern by viewing it through a different frame or connecting it with other pieces of information.”

(Schoemaker & Day, 2009)

Weak signals versus indicators

weak signals ≠ indicators

vague

Seemingly random

disconnected

ambiguous

low visibility

clear

Observable characteristic

measurable/ operational

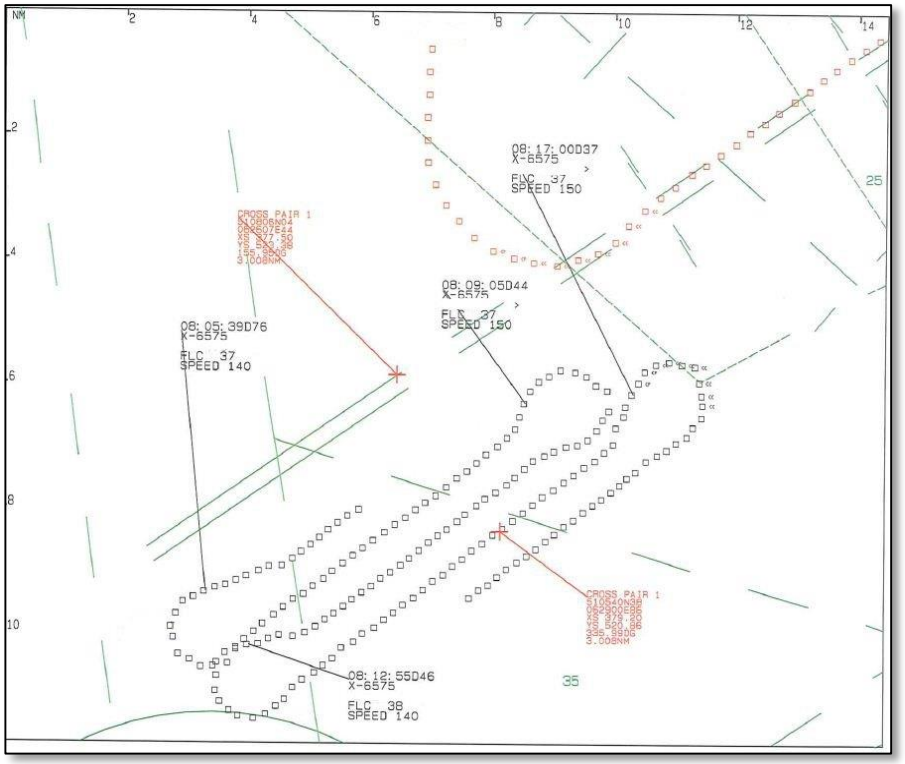
visible

(Bev Doolittle, Woodland Encounter, 1981)

Analysis of incident data

- Discussion with people who were involveld and people who investigated the cases
- Rather „clear“ and „strong“ signals
- It is not the signal

which is weak



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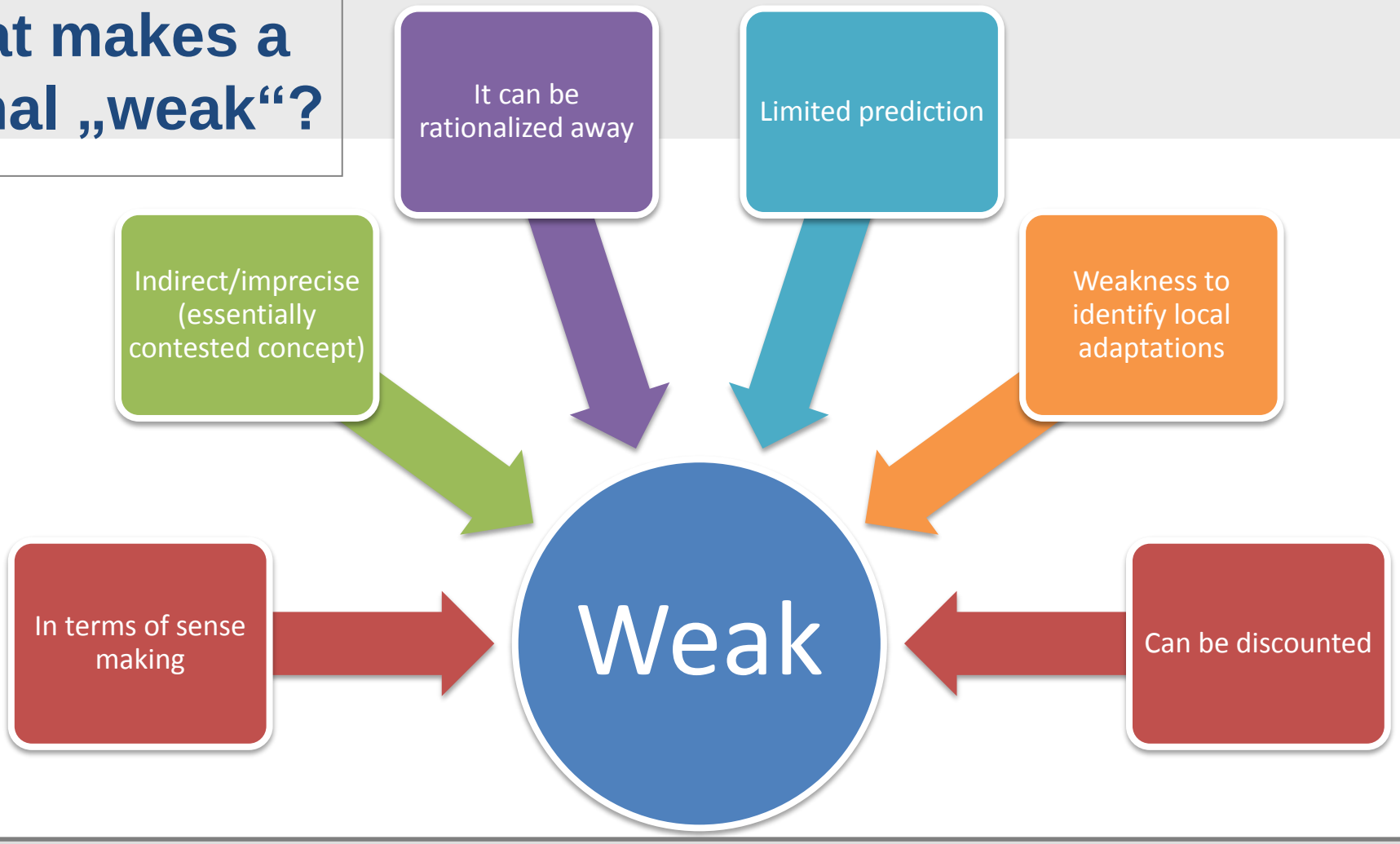
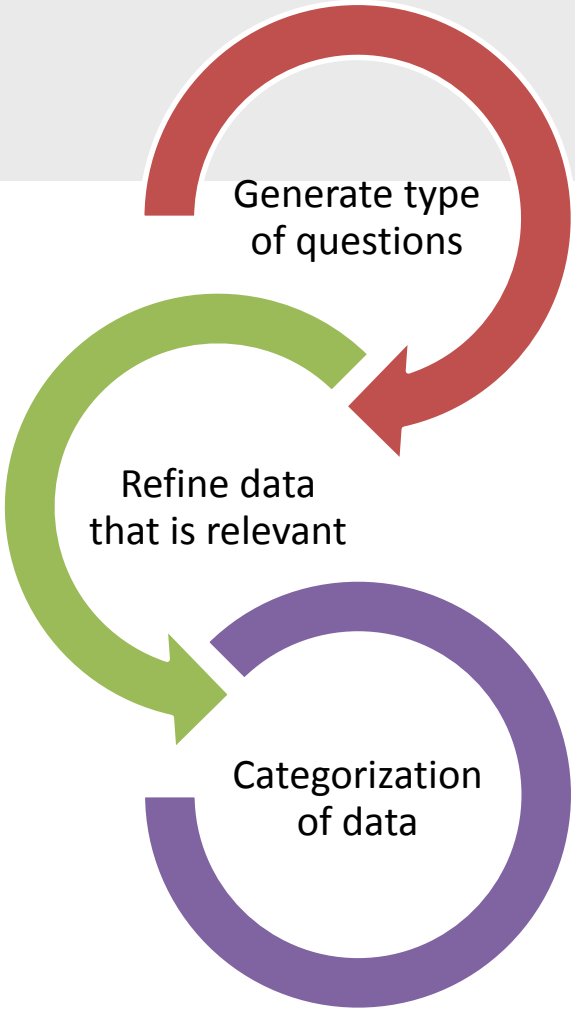
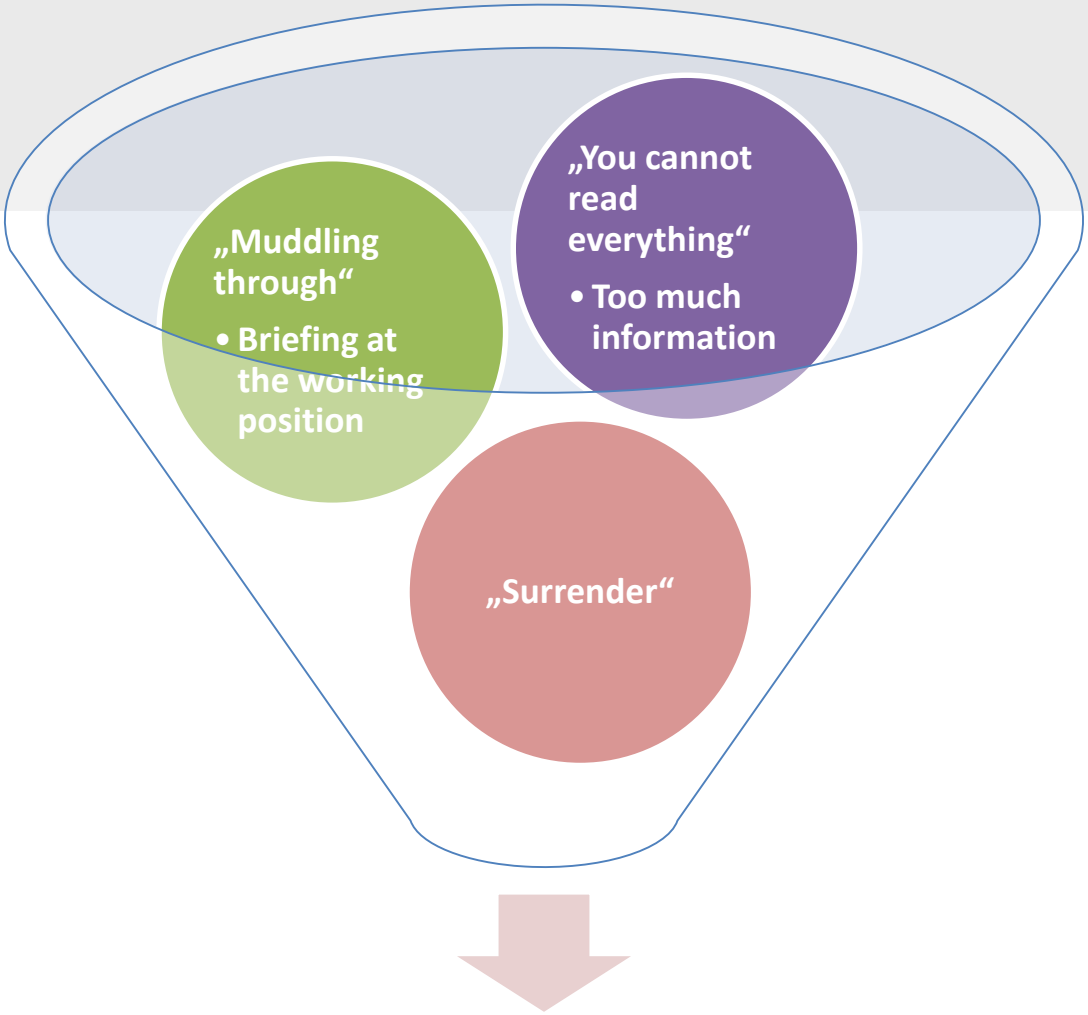
What makes a signal „weak“?



Analysis of the data



Example #1



Electronic Briefing System

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Example 1:EBS

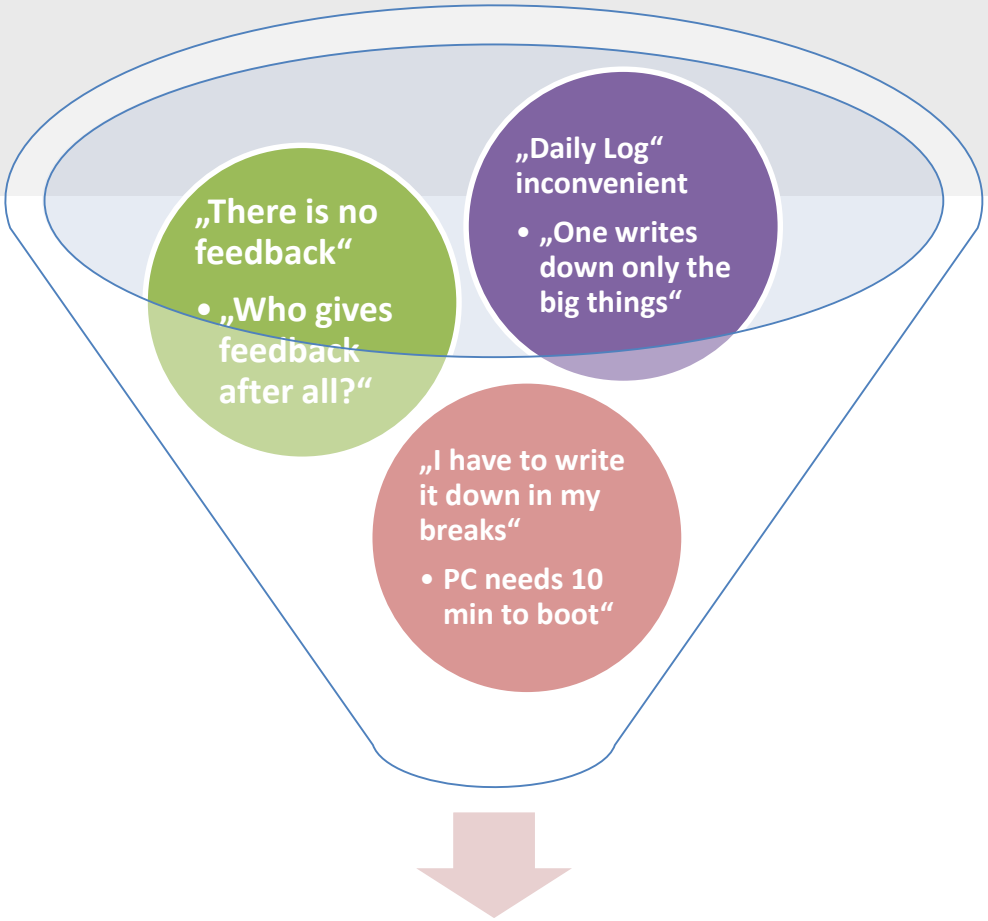
Example 1:EBS

- Gap of making data available vs. being able to extract what is meaningful in context
- No active synchronization across different roles

Also changes in:

- Role of supervisor
- Team structure

Example „1b“



Transfer/reporting of information

Reporting systems

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Short description:	Ausfall ILS in EDLN RWY 31
Description	Am Flughafen Mönchengladbach (EDLN) ist das ILS der Runway 31 ausgefallen. Es ist kurzfristig ein NOTAM veröffentlicht worden. Dieser Umstand war jedoch im Kontrollraum nicht bekannt, weder den Lotsen noch den SVen. Im EBS ist keine entsprechende Meldung veröffentlicht. Aufmerksam wurden wir erst durch einen Anruf des TWR-Lotsen EDLN, als wir eine Maschine schon weggeschickt hatten. Position der Maschine beim Anruf ca. 3 NM Endanflug. Zum "Glück" ist dieser Umstand dem Piloten aufgefallen und das Wetter hat einen Weiterflug ermöglicht. 2 Stunden vorher war in EDDL die Kontrollzone "IMC" und Wolkenuntergrenzen bei ca. 800 ft. In EDLN kommt es seit Jahren zu Einschränkungen bei den Anflugverfahren. VOR Approaches sind momentan auch nicht möglich, somit bleibt bei RWY 31 lediglich der Visual Approach.

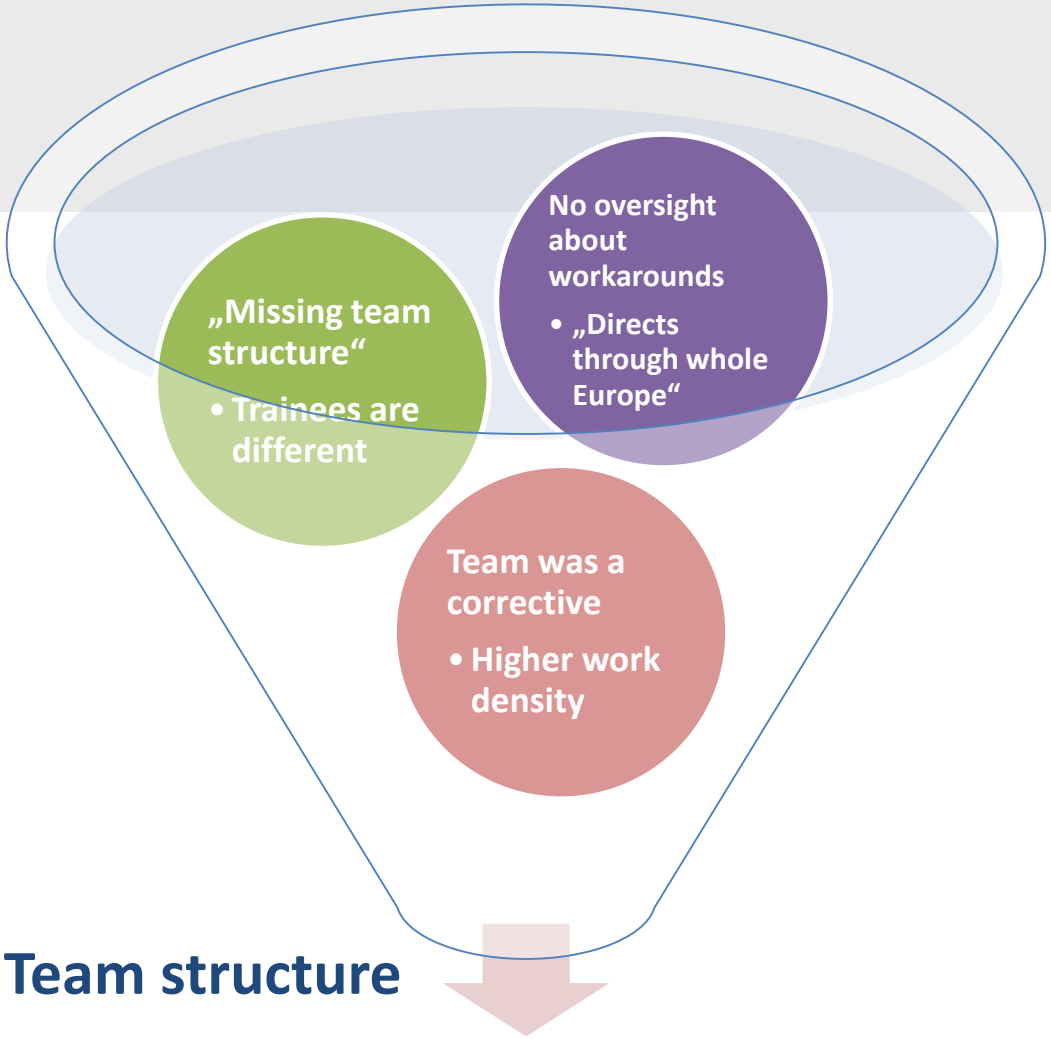
Action:	
File:	26.03.2014 09:18:25 _____ Bei Ausfällen von Nav.-Anlagen und auch ILS wird ein NOTAM durch SIS veranlasst und gem. BA Technik der SV des zuständigen ACC informiert. 26.03.2014 14:36:39 _____ Im Fall von EDLN gehört das ILS dem Flughafen und wird nicht durch die DFS überwacht. Hier ist der Flughafen für die Überwachung und die Veröffentlichung von NOTAMs verantwortlich. Zudem sind die Regelungen des LoA zu beachten (Austausch von relevanten Informationen zwischen den Kontrollstellen). 08.04.2014 12:33:10 _____

Reporting systems

- Workload is saturated („I won´t do the extra task“)
- People often don´t see a benefit
- „If I don´t see the system as a whole not doing anything with the report I don´t report“

- **Are you passive waiting for information or an active exploring organisation?**

Example 2



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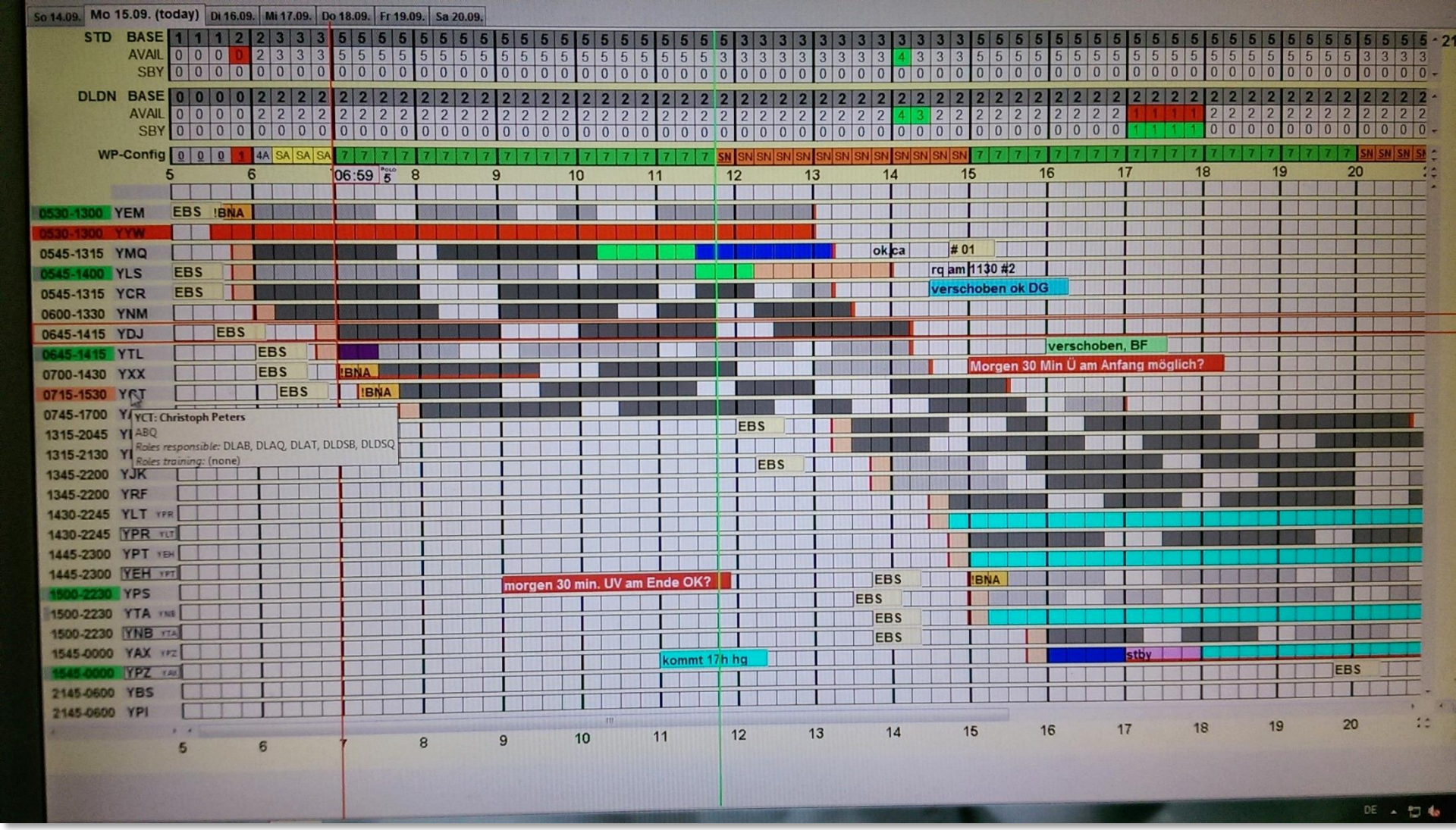

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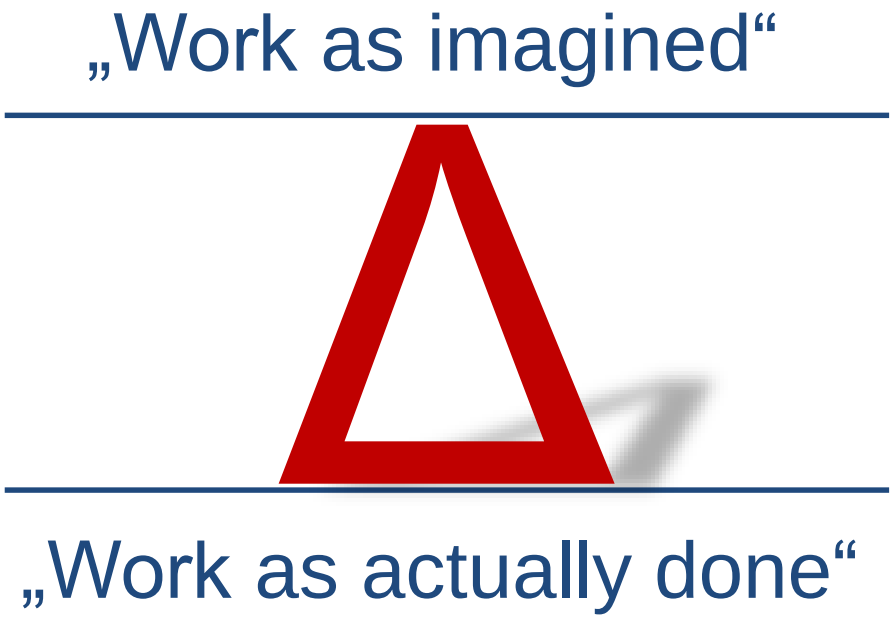
Example 2: Team structure

- From team work structure to a role structure
- „Total flexibility“
- Team as a „correctiv“ no longer exists
- Training changes

Adaptations cloak the „real“ picture

- Adaptations hide workload bottlenecks
- Local adaptions: do we want this on a global scale?



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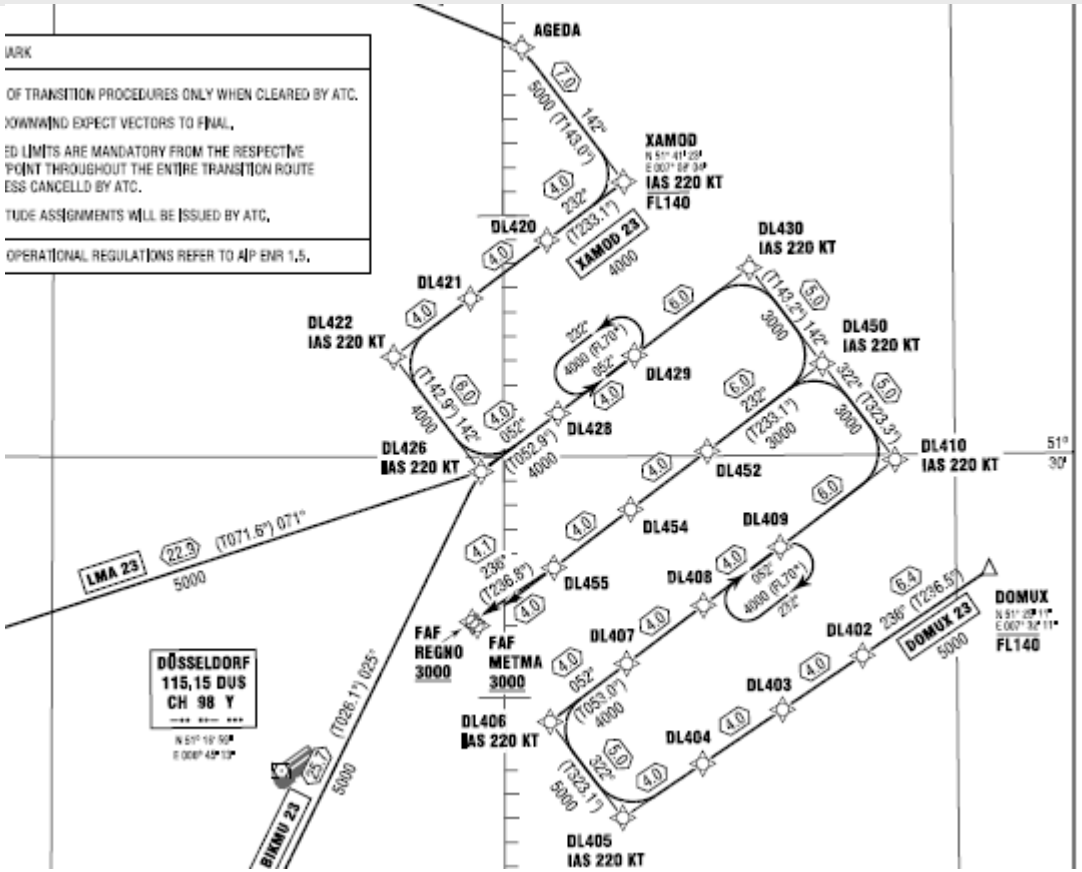
Approach EDDL (as imagined)



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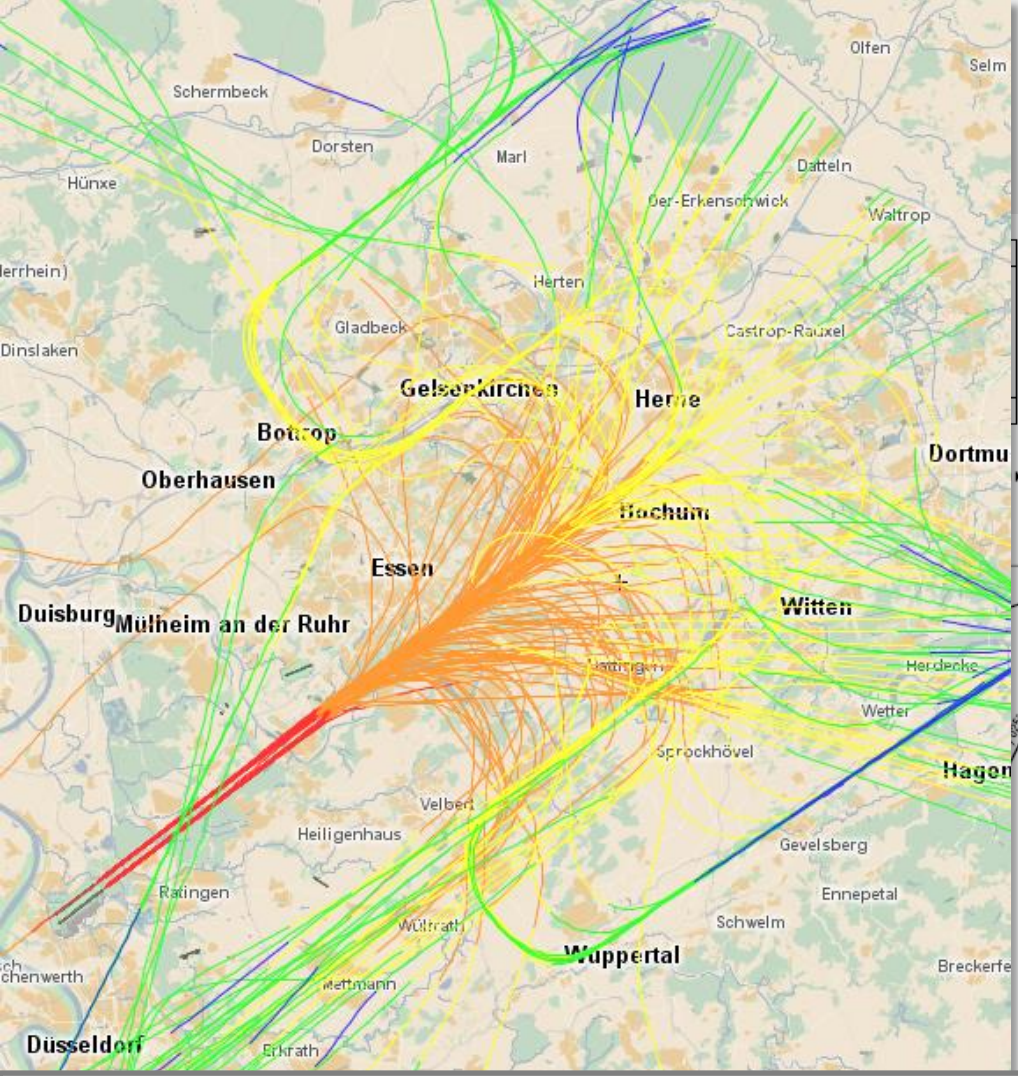
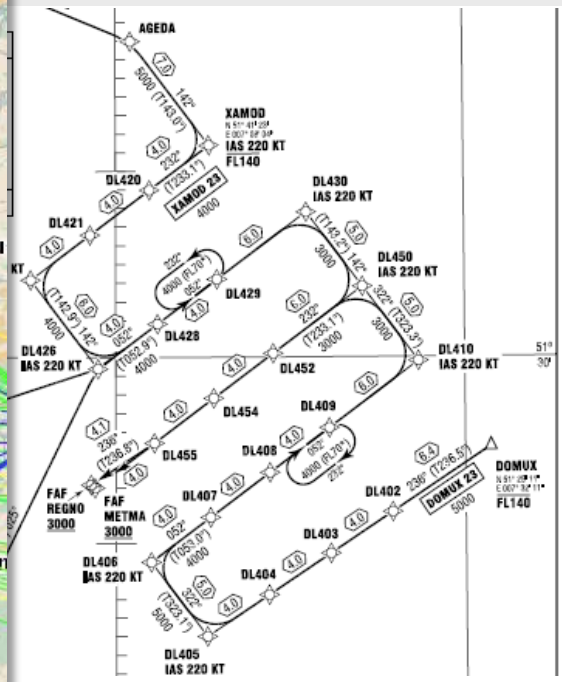
And as done…





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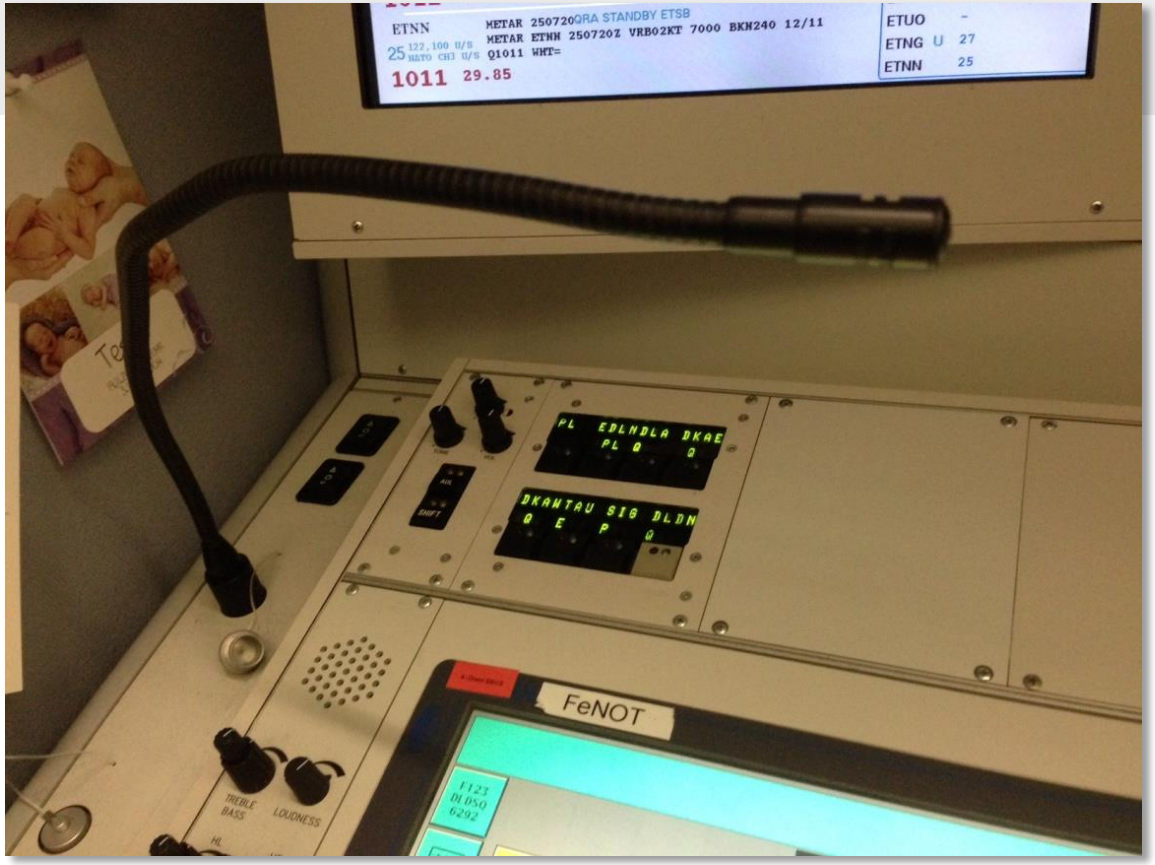
Workaround



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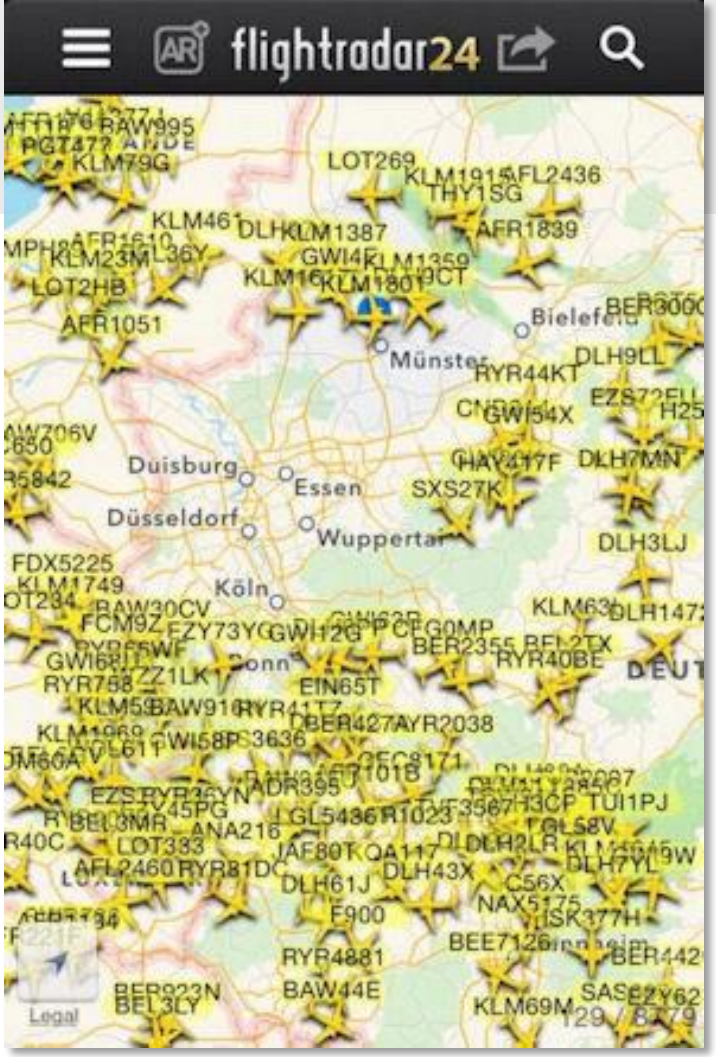
Bad weather (09.06.2014)



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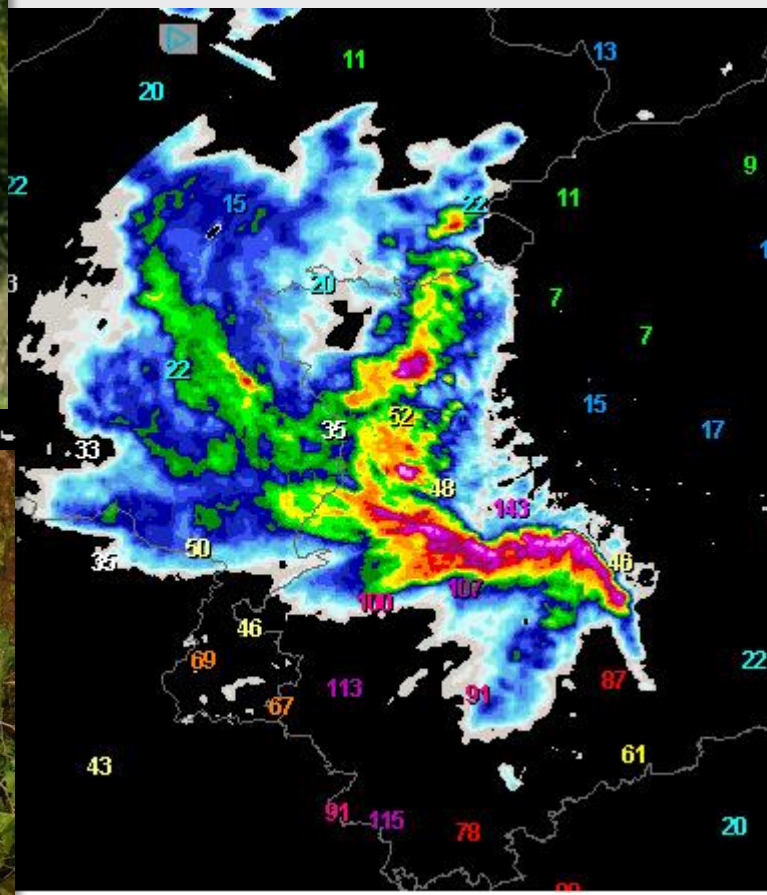

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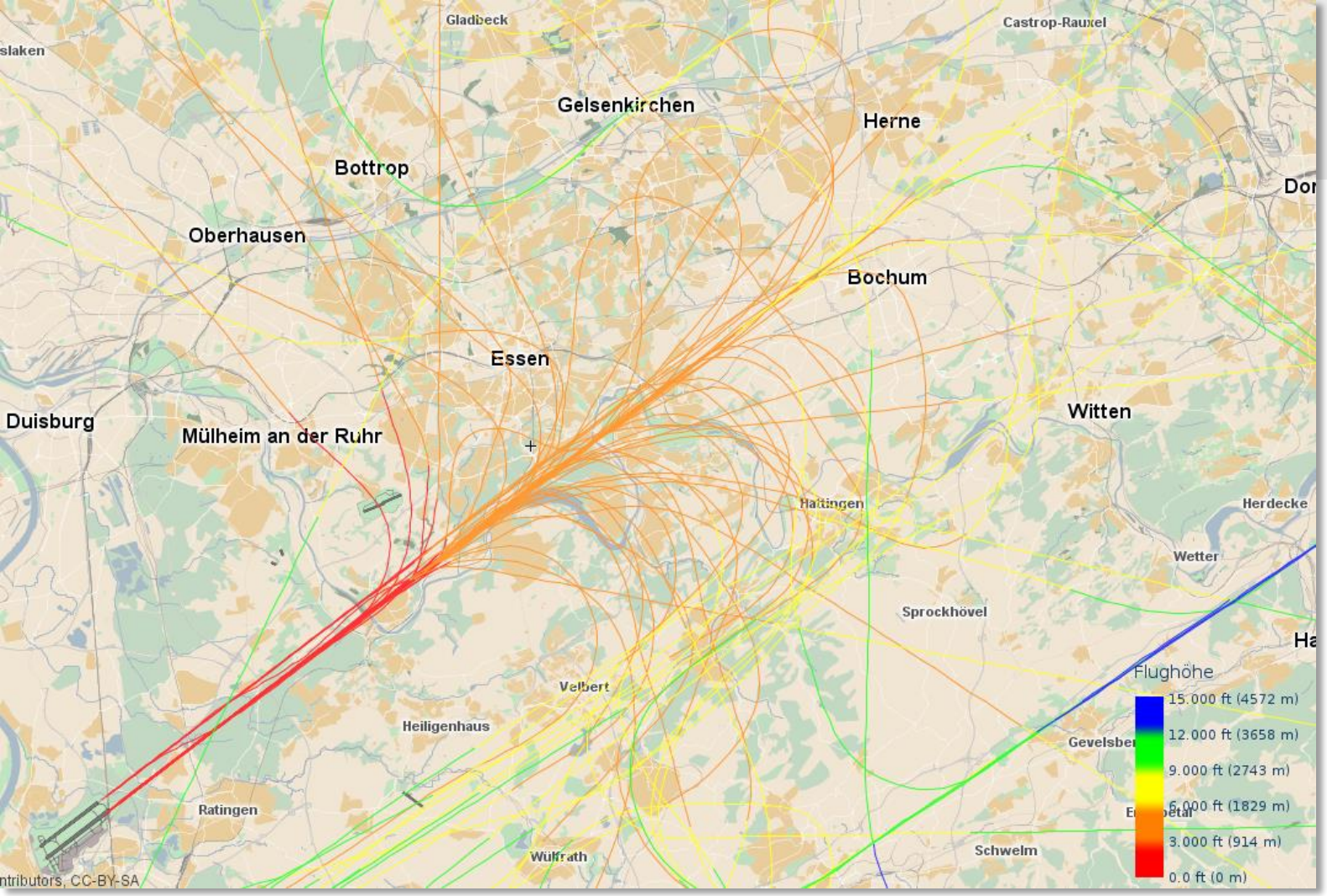

Flight tracks (09.06.2014)

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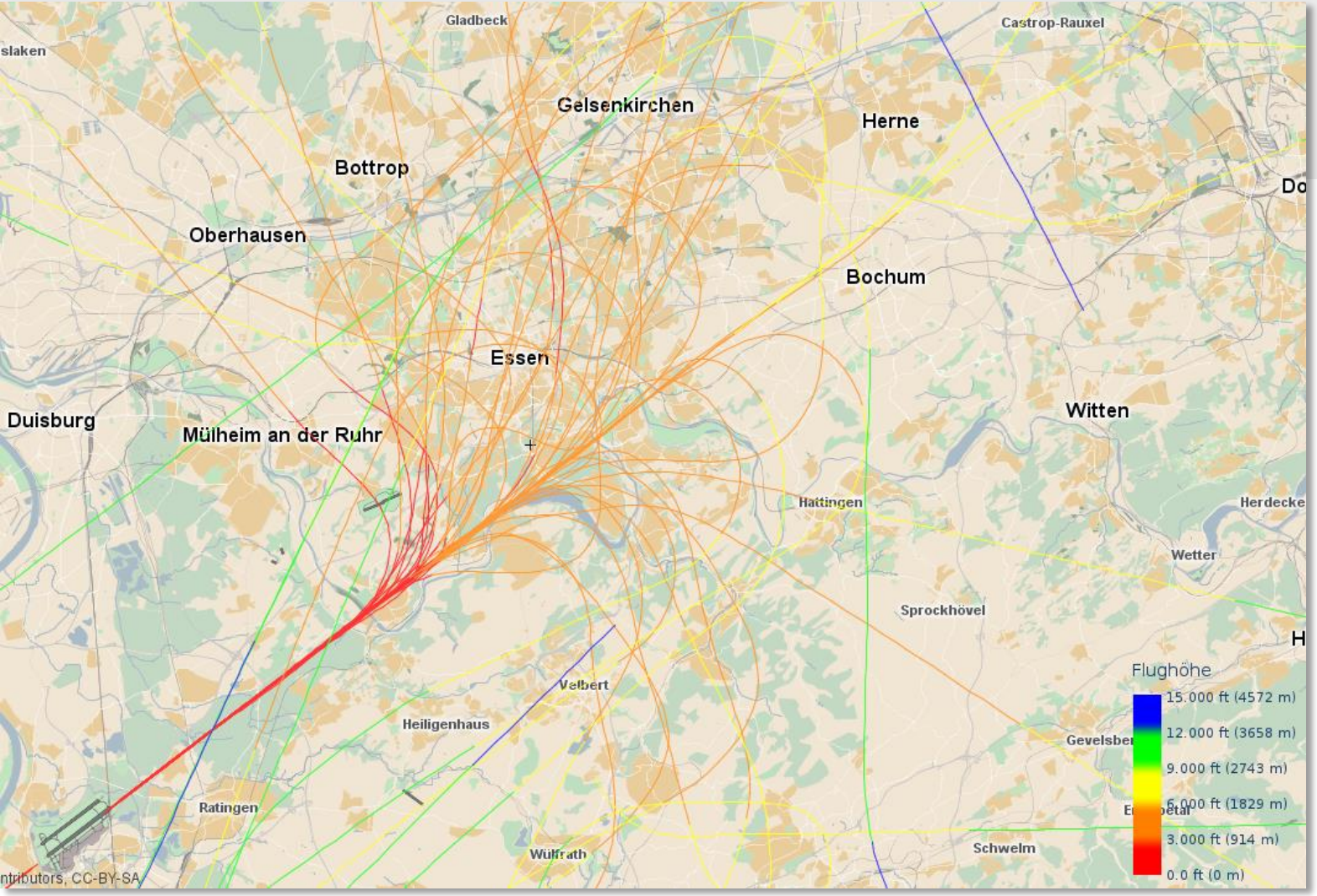
20.06.2013 Inbounds (1200-1500)



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Coordination

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Weak Signals - Conclusions

- Extension from a reactive into a proactive SMS
- Transfer into a learning organization
- Make adaptations visible

- Perspective shift is required
- Being sensitive / primed to weak signals

Weak Signals

"As soon as you go proactive all the notions of 'weak' become very strong and important"

(David D. Woods, 2012)