Safety KPI – what for?

Learnings from the attempt to build a meaningful Safety Management Cockpit

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Why measure safety?

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- To prove how good we are…. Hooray!
- Because others do it, too…
- To punish.
- For the money (to get a bonus).
- To compare with others.
- To identify trends.
- To improve.

Why measure safety?

Goal of a Safety Management System SMS:

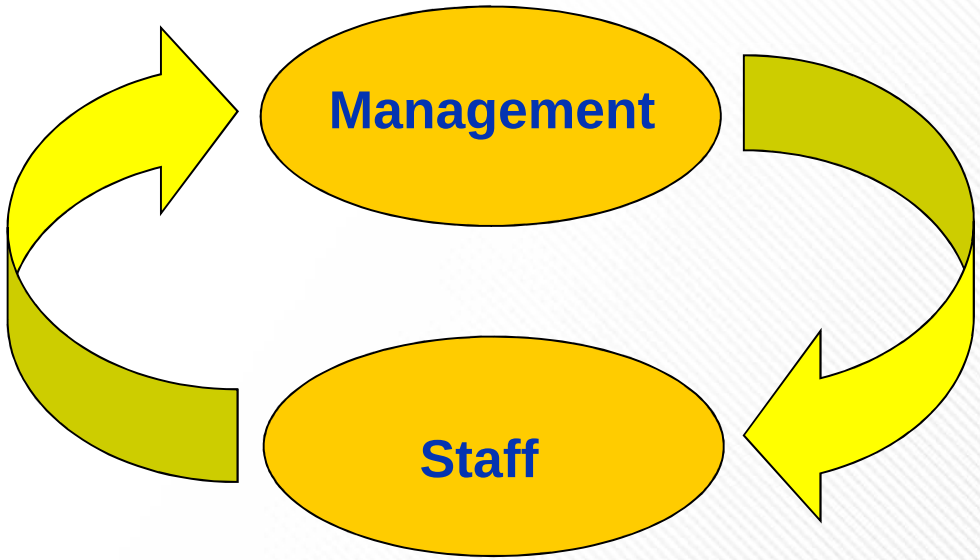
Continuous safety improvement

Corrective actions from analysed safety performance monitoring data

OIR

SIR

Audit findings



Lessons learned

Measures for Improvement

What to measure?

Reactive indicators:

- To measure the (long-term) impact of our safety efforts
- To identify hotspots and trends
- To verify/validate assumptions made in pre-assessments

Difficulties with reactive indicators in ATM:

- Very low numbers for significant events (low probability)
- Direct allocation of impact to efforts
- Creates "bad" feelings and urgency to immediately react
- In most cases only negative data is measured

What to measure?

2

Proactive indicators:

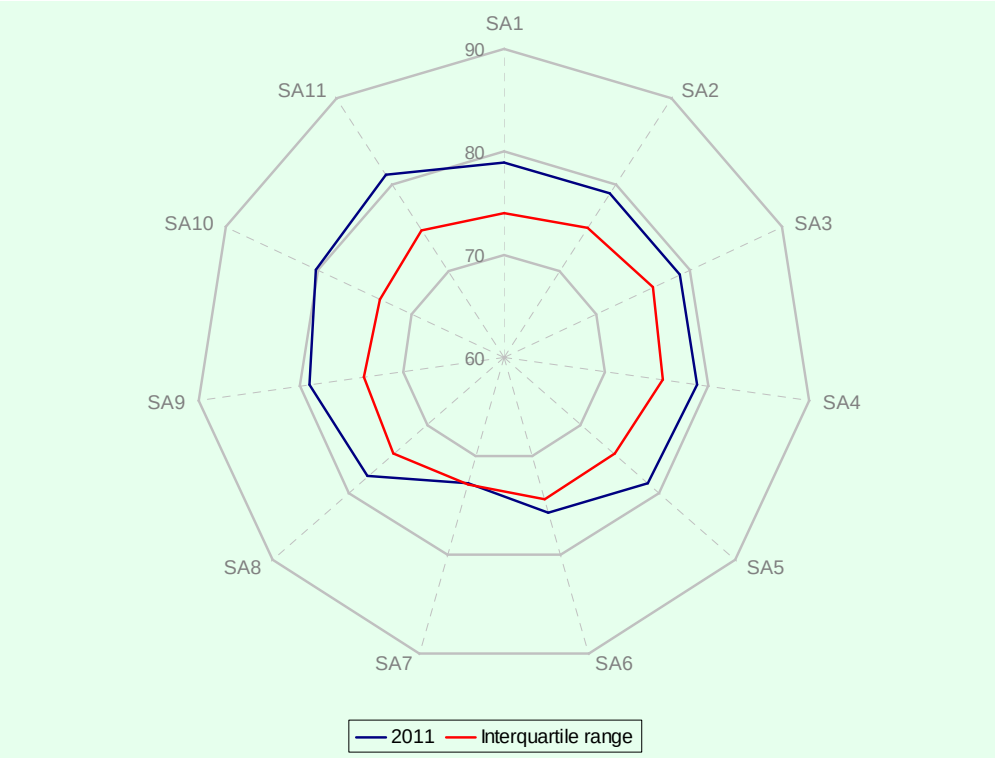
- To measure safety efforts (output)
- To detect week points, possible problems
- To identify drifts into failure

Difficulties with proactive indicators in ATM:

- Difficulty to argue direct relevance, to justify measures
- Information might be biased
- Building relevant proactive indicators is difficult

What to measure - example for proactive SPI

SPI 1a - Safety Maturity Index according ECTL SRU



Agenda:
Safety culture
SA1 Development of a positive and proactive safety culture
Safety Policy
SA2 Org. and individual safety responsibilities
SA3 Timely compliance with international obligations
Safety Achievement
SA4 Safety standard and procedures
SA5 Competency
SA6 Risk Management
SA7 Safety interfaces
Safety Assurance
SA8 Safety Reporting, Investigation and Improvement
SA9 Safety Performance Monitoring
SA10 Ops. Safety Survey and SMS Audit
Safety Promotion
SA11 Adaptation and sharing of best practices

What to measure?

2

Sharp-end indicators:

› Measuring failures directly at the impact point

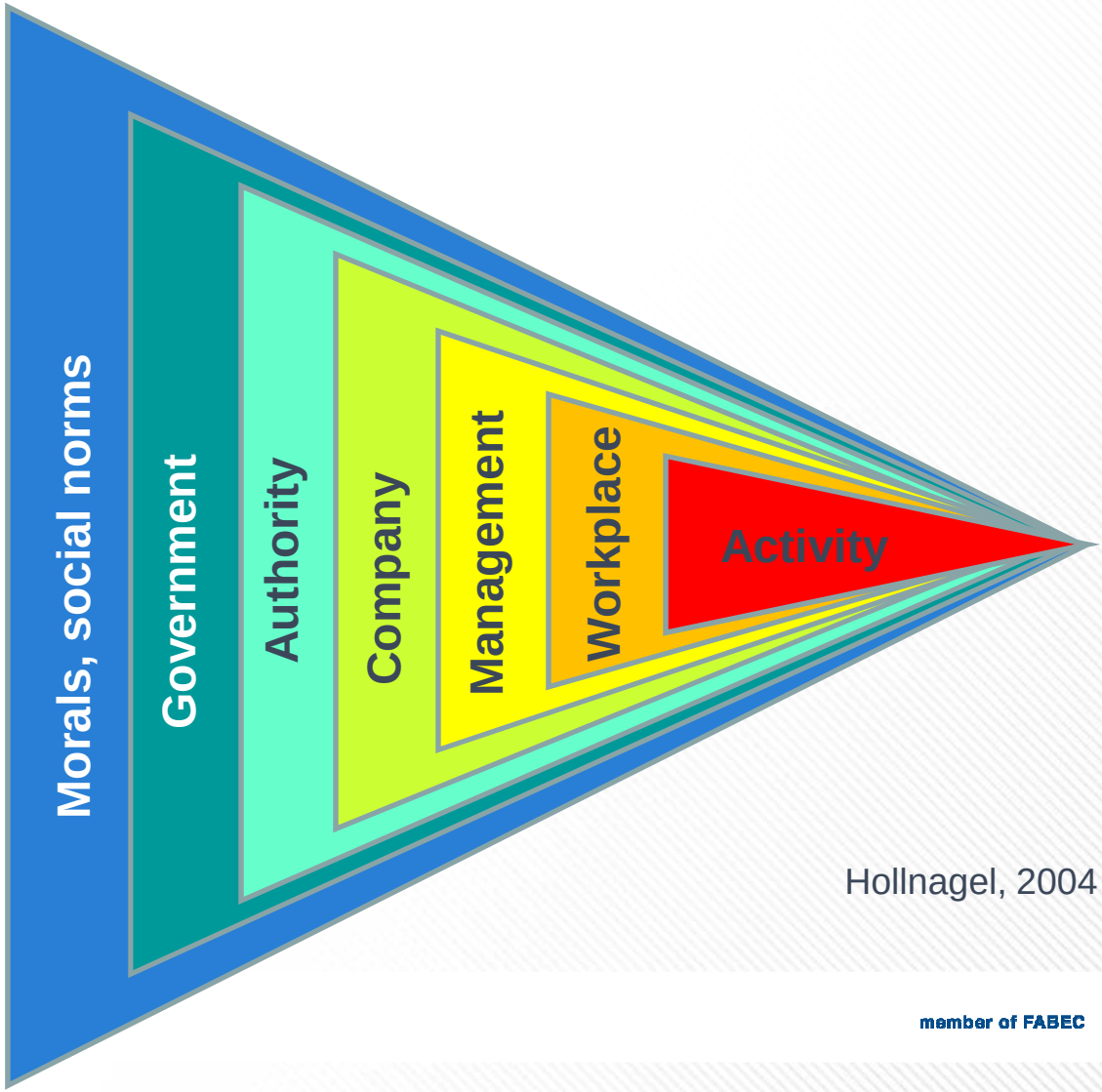
Difficulties with sharp-end indicators in ATM:

› Have a high potential for blaming operators

› Blaming or even punishing the operators will reduce the number of reports and the effectiveness of the SMS

What to measure? Sharp-end vs. blunt-end

Blunt end: unwanted outcomes happend earlier and somewhere else



Sharp end: unwanted outcomes happen here and now

Hollnagel, 2004

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What to measure?

2

Blunt-end indicators:

› Measuring things which can contribute to sharp-end failures

Difficulties with blunt-end indicators in ATM:

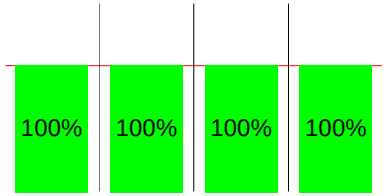
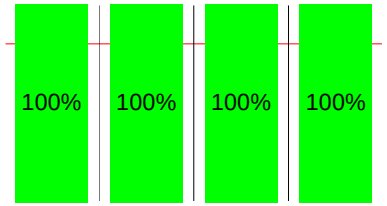
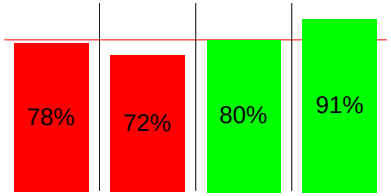
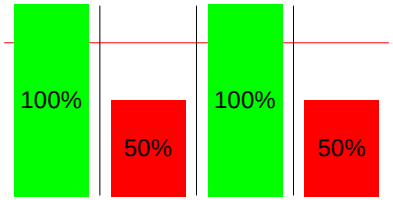
› Sometimes difficult to measure

› Sometimes difficult to allocate the direct relevance

› The further away we go from the sharp end, the more difficult it gets to take corrective actions (no direct control)

What to measure - example for blunt-end SPI

SPI 3	Management attention for safety

SPI	Definition	Target 2011	Level reached Q3 Q4 Q1 Q2	Review	Target 2012
3a	SSG and SSG-Subgroup meetings realised vs. planned	100%		nil	100%
3b	EM meetings: 5 times 30 minutes and one time 60 minutes dedicated to safety matters - realised vs. planned	80%		nil	80%
3c	Attendance SSG and SSG-Subgroup (presence members or deputy)	80%		In average, 91% of all SSG and SSG-Subgroup members or representatives were present during the 2nd quarter 2012.	80%
3d	Training sessions in SSG and SSG-Subgroup meetings as planned in yearly program	80%		1 of 2 trainings have been hold during the 2nd quarter 2012.	80%

What to measure?

2

"Hard" or direct indicators:

- Probabilistic or quantifiable indicators

Difficulties with "hard" or direct indicators in ATM:

- Do we count the right things?
- Relatively easy to apply in technique, much more difficult to apply for e.g. human factors

What to measure?

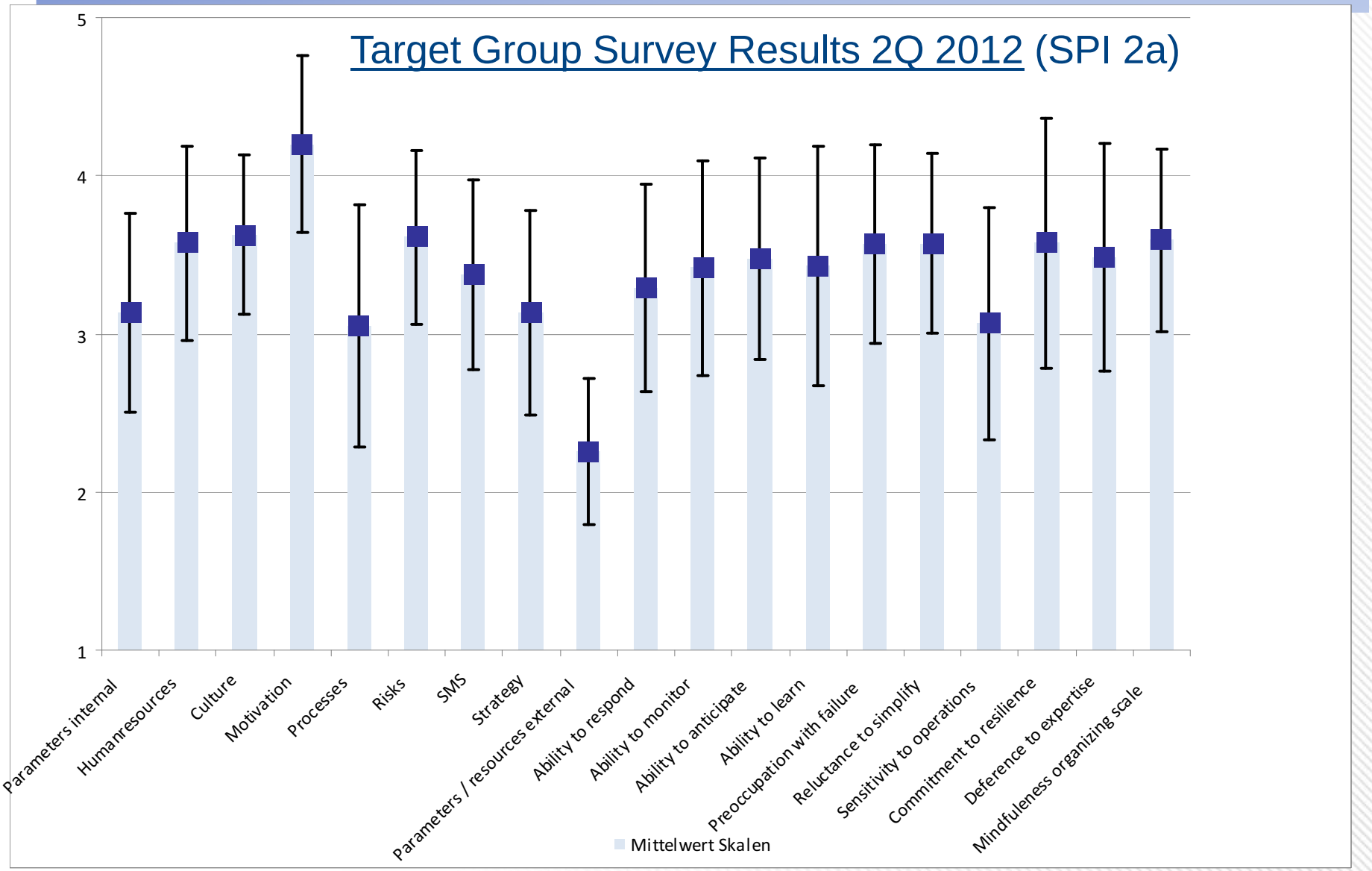
"Soft" or indirect indicators:

- To measure symptoms
- To get a feeling for the consequences of actions
- To "measure" safety culture

Difficulties with "soft" or indirect indicators in ATM:

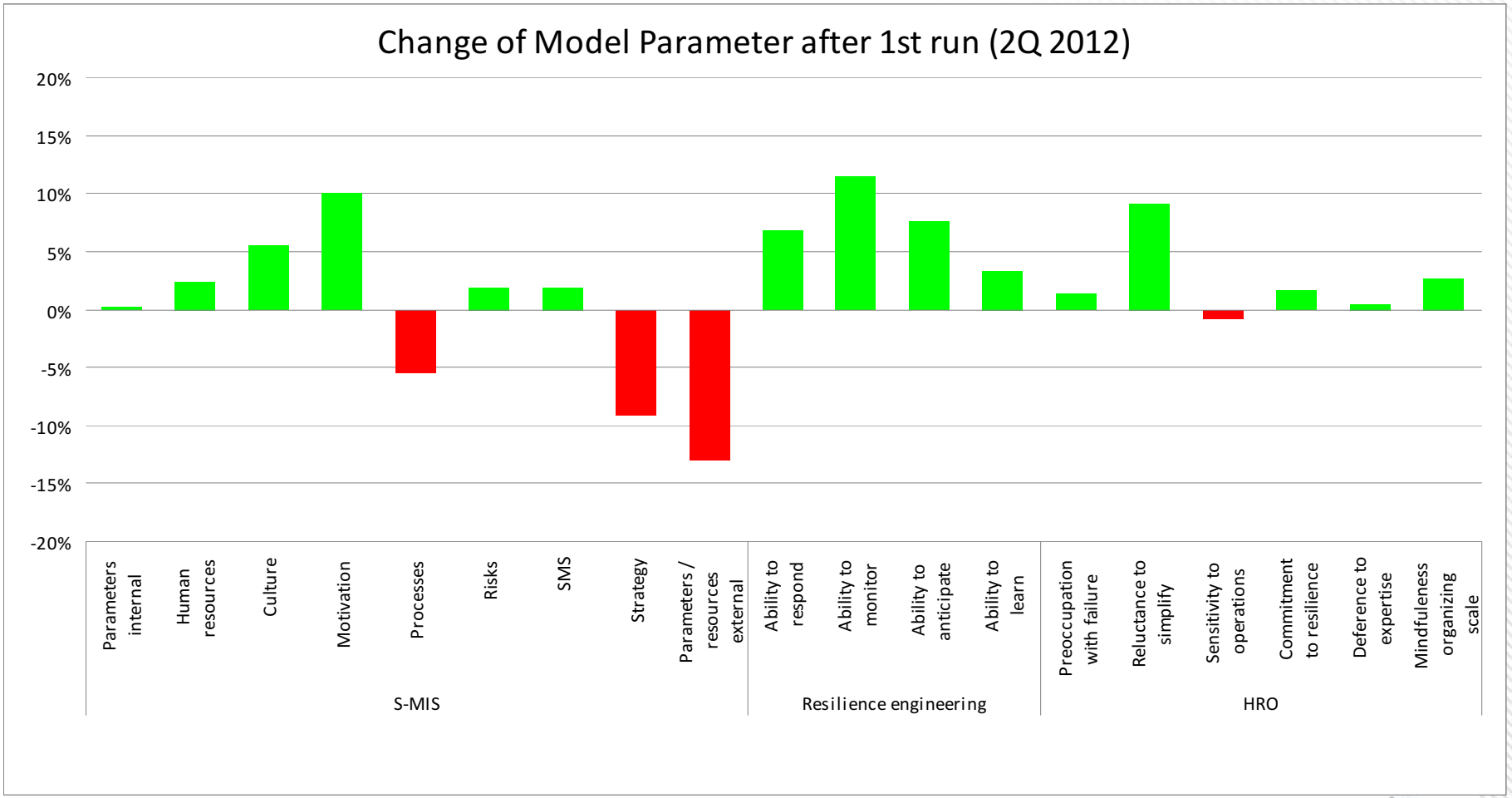
- Considerable effort needed (lots of people involved)
- Individual measurement may not be relevant, but trend analysis are -> long term indicator
- Needs an open and trustful culture

What to measure - example for "soft" SPI



What to measure - example for "soft" SPI

Target Group Survey (N25 deviation against basis N104) (SPI 2a)



How to measure?

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- **Safety Performance Indicators (KPIs):**
- are measuring the output of our safety efforts
- mostly proactive, indirect, blunt end
- tools are surveys, safety improvement reports from staff, analysis

Safety indicators (SI):

- are measuring the safety impact of our safety efforts on our system
- mostly reactive, direct, sharp end
- tools are "been counting" data collections, occurrence reports

What to do with the measured data?

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- We measure a lot of data – which must now be turned into information, through proper analysis, involving operational experts.
- One measurement cycle is very rarely relevant – but trend analysis are, over longer periods; therefore it is important to stabilise the KPIs.
- Very often you will not find very significant variations – but this is also a relevant information.
- The biggest difficulty is to decide when to take corrective actions – you can over-react, or react too late.
- The further you measure towards the blunt end, the more difficult it becomes to argue for taking corrective actions.

Conclusions: Why do we need Safety KPIs?

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- We need to measure safety indicators in order to be able to improve more effectively.
- We have to measure different sets of safety indicators: reactive – proactive, sharp-end – blunt-end, direct – indirect.
- We have to use a mix of measurement techniques. The effort is considerable!
- The most difficult part is the transition from measured data to information which is useful for improvement.
- Expectations are high – results sometimes not very significant, but still relevant.

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Questions?

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