Methodological issues and pitfalls of short safety culture questionnaires

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ABSTRACT: Safety culture surveys have been fielded in many different sectors of industrial activities. Many of these surveys consist of a long list of questions which is time consuming for the respondents. As part of the FP6 HILAS project a shorter survey has been developed, which aimed at getting a high response rate. The survey should give insights into employees' views about safety, safety culture and climate. It is aimed at identifying issues for improving safety performance in rapidly developing airlines. The survey has been conducted in a globally operating aviation organisation. 1921 employees responded, which corresponds to 68% of the workforce. Each set of statements had a comment field to explain or illustrate answers. In addition to quantified scores to assess the employees' perceptions, we got many and valuable comments. The comment fields give more insight in the areas in which the employees have concerns.

1 INTRODUCTION

Assessment of the safety culture in high-reliability organisations in civil aviation is important for developing effective strategies for change to enhance efficacy and control of safety risks. Safety culture surveys can help to benchmark a safety culture level and to assess change over time. The aviation organisation in our study, is seeking to effectively integrate the operating entities around an open and just safety culture under pinning a standardised Safety Management System (SMS). The survey combined with an assessment of SMS performance throughout the entire organisation are essential elements in the formulation of company strategies based on an integrated SMS that includes a cultural change program to align all operating entities to a standardised safety culture. This process embodies the concept of improvement breakthrough to understand cultural attitudes, diagnose sub-cultural issues and design an intervention program to support cultural change based on Juran's control and breakthrough cycle (Juran and Godfrey, 1995). The control cycle in Juran's approach resembles very much the Deming's PDCA cycle in a relatively unchanging operation. The breakthrough process stirs up the organisation's processes and structures, and thus also cultural patterns that can lead into in a renewed stable control cycle. The short survey is designed to function as a breakthrough lever.

Usually, safety culture survey questionnaires are long, from 100–150 questions up to 250 questions, which require significant time to answer by each single person (see e.g., Flin et al., 2000, Guldenmund, 2000, Health and Safety Executive, 2005, Singla et al., 2006). The questionnaires include a long list of items in order to study the construct of safety culture and its dimensions. It has provided many new insights in various hazardous and especially technology oriented sectors. However, there are critical views on how the results on safety culture via such questionnaires are used in practice. In practice the main point is usually safety and when adding item scores to dimension scores and sometimes dimension scores to a safety culture (climate) score the same weight is put to entities that may not have the same weight for safety at all. Furthermore safety culture scores, even scores for dimensions, can be improved by making good item scores better and leaving the bad scores bad. In some cases it may be as improving a leaking bucket by

making the strong parts stronger and leaving the holes open (Akselsson et al., 2009).

Building on the work in the SMS Task Force of the EU FP6 HILAS project (Akselsson et al., 2009), we developed a short safety culture survey questionnaire, including free space for comments and suggestions. The aim of the survey, different from the traditional research oriented safety culture surveys was to identify holes in the culture and areas for mitigation. The shorter survey therefore contains questions (items) believed to be important for safety and for identifying efficient mitigations for improved safety. The survey questionnaire addresses three groups of aspects of resilience safety culture in which an organisation expresses itself: psychological aspects (how people feel), behavioural aspects (what people do) and situational aspects (artefacts such as the SMS, what the organisation has). Here we also make use of Bandura's model of reciprocal determinism stating that these three groups of aspects influence each other bi-directionally in a positive way (Bandura, 1977b, Bandura, 1977a, Bandura, 1986). It is easy for management to understand the coupling between behaviour and artefacts on one hand and safety on the other hand. Bandura's model says that focus on all three aspects would be a good way to improve behaviour and artefacts and thus safety. That means that survey which give insights in all three aspects should give management a good basis for improving safety.

The answers should also provide a good base for the interview part of a resilience safety culture investigation. The number of items is not enough by themselves to accurately reflect different safety culture dimensions as the more traditional surveys can do. However together with comments given by the responders and the interviews the questions should give a good base for improvements of the safety culture and safety. The questionnaire is still under development. According to our estimations it takes about 10 minutes to answer, thus promoting a high response rate. The survey results should be the base for interviews or focus groups for further identification of areas of behaviour and artefacts (e.g. parts of the safety management systems and technology) to improve.

In this contribution we discuss how we dealt delivering the results of the survey to the company. We will address influences from incidents which occurred during the course of the survey. Before briefly explaining the survey, the organisation is described. The results we present are anonymous.

2 THE AVIATION ORGANISATION

The short safety culture questionnaire has been used to gain insights in the safety culture in a globally operating group focussing on various aerial services especially emergency related services. These include for example medical emergency, fire fighting, civil protection, sea and mountain search & rescue, coast and fishing surveillance, aerial works and people transport to offshore facilities. The group operates in multiple countries in Europe, South America and Australia. The organisation consists of a small global group of country-specific operating companies (except for one country with two operating companies). The group wants to improve its safety performance. To do so, change of current practices is required. For this reason the safety culture survey was not just aimed to measure its current culture level, but it should reveal opportunities for improvement and issues that create resistance within the organisation.

The safety culture survey was set up assuming the problem owner to be the Group Safety Director. Later, while reporting the first results to our client, it appeared that he was not the main problem owner. The results should instead be fed to the managing directors of the separate operating companies. They are less interested in a large presentation at global level, but rather in a 2–3 pages report specifically for their own operating company. For the reader of this paper it is important to realise that since the safety culture project has started, a number of serious accidents and incidents have occurred in various countries during different types of mission within the group.

3 QUESTIONNAIRE

The safety culture survey consists of five blocks of questions preceded by an introduction explaining the purpose of the survey. An online questionnaire platform, NetQ currently known as Collector, was used. For the employees of this international operating aviation organisation the survey was available in five different languages: English, French, Italian, Portuguese and Spanish. Table 1 shows the blocks and the main questions. Each question has several answering categories from which respondents had to select the most appropriate.

The first block after the introduction contained questions about the personal and employment status of the respondent. To interpret the results, we not only needed to know if the respondent is part of flying or ground staff, but also on what base in which country he or she works. Depending on the job type an additional question on their task was posed. Front line personnel were to state their main (emergency) aerial services. Technicians were asked if they are licenced and what type of aircrafts they maintain. The remainder of ground staff was asked to specify their main (administrative) task.

Table 1. Layout of safety culture questionnaire.

1. Working details	– Business unit – Age – Nationality – Kind of work (front line, technician, administrative) + additional question based on selection – Country, Base in the selected country – Years worked in the company – Current type of employment
2. Safety Culture	– Skills and communication (5 statements) – Procedures (9 statements) – Employee behaviour (4 statements) – Management behaviour (7 statements) * comment field available per set of statements
3. Resilience	– Effect of atmosphere and attitude on work environment – Change of atmosphere and attitude past 12 months – Potential safety threats near future (week, months) + specification of these threats * comment field available for each topic
4. Improvements	– Order which improvements of 10 items have the most positive effects on the safety record * comment field for the improvements
5. Comments	– Open question about any (additional) concerns or suggestions for improvements

Respondents were only directed to the questions relevant for them given their country of employment and their job type.

In blocks 2 and 3, respondents were asked to what extend they agree with each statement on a 5-point Likert-scale. The safety culture is measured using 25 statements for 5 different topics (see Table 1). These statements are based on the first safety survey example from GAIN (Global Aviation Information Network, 2001). The Resilience topic included three questions about the current and past atmosphere and threats. The questions on threats includes a free text entry to specify what type of threats the respondents see that may decrease their willingness or possibility to work safely in the near future. In the Improvements block, the respondents were asked to rank 10 different intervention areas for safety improvement based on their judgement of significance. These items were: technical equipment, maintenance, training, crew scheduling practice, management commitment to safety, external regulation, staff commitment to safety, effective staff feedback on safety issues, standard operating procedures and external contract & contractor oversight. The last block was included in the survey to post any concern about safety or suggestion for improvements that respondents had not made before. Besides the open question in block 5, a respondent could provide a comment to each of the 8 topics in block 2–4: thus, in total there were 9 opportunities to submit comments freely throughout the survey. These comment fields had been added to get a first impression on emerging issues which are described by the employees. These can yield an explanation for the scoring on the statements, the atmosphere and attitude and options for improvements. Respondents were asked to answer the open questions preferably in English or otherwise in the language of the questionnaire they had selected.

4 ANALYSIS APPROACH

The survey includes both quantitative and qualitative data. Analysis of the quantitative data should show *significant discrepancies* in judgments *amongst different categories of employees*. This includes for example differences between the work floor (pilots, crew, and maintenance technicians) and managing staff (directors, supervisors and middle management). For this sake the groups are compared based on their average scores. The Likert-scale was translated as follows: 1—strongly disagree, 2—disagree, 3—unsure, 4—agree and 5—strongly agree. Next to discrepancies between categories of employees, the quantitative data was analysed to find issues where a *significant number* of employees *do not judge the company positively*. This analysis included all respondents except the directors. The directors have a different role in the change process. They may be confronted with resistance from any of the other job types. If a significant number judge the statements as not positive, this group may cause resistance against change in the organisation. The first indicator, the average number, might 'hide' that some employees disagree especially if others strongly agree. Apart from the average we therefore determined whether more than 25% of the employees did not agree with the statements. This criterion was arbitrary and should in future surveys be set by the company.

The qualitative analysis concerns the comment fields. Analysis should identify *areas of concern* that are expressed by respondents. Processing was done in several steps: firstly, all comments were

translated into English. Secondly, comments per question were sorted based on country, business unit and job type. For the pilots and crew the comments were sorted further based on their main mission in aerial service. The resulting sorted list helped to put the comments in perspective: in business unit X, various crew members performing mission Y comment on personal protective equipment, or in business unit B maintenance personnel comment on lack of fit-for-purpose tools for working on specific types of aircrafts. Thirdly, the comments are summarised addressing the issue, per question. Finally, for each operating company, a list of *key issues* based on the comments and the quantitative data was formulated to focus attention for strategic intervention. These key issues are the main areas of concern in the perception of the respondents. Further verification and validation is required to determine if all these areas are really issues for the operating company. Therefore, interviews shall be the next step after the survey is held. The interviews will help to verify and validate the results and in addition may provide explanation for the emerging picture.

5 DATA COLLECTION AND RESPONSE

The survey was launched mid April 2012 and kept open for response for 25 calendar days. All employees received an email request to fill in the survey. The response shows four peaks. The first and highest peak is shown the day the survey was launched. The second peak can be found four days after launch. At this day a safety meeting was held. The third peak (day 12) and fourth peak (day 19) related to reminders sent to the employees. 2383 employees started the survey of which 1836 completed it. Another 85 employees who answered blocks 2 and 3 about safety culture and resilience, but did not complete block 4 about improvements, were considered valuable for analysis. The number of respondents therefore is 1921, which corresponds to 68% of the employees. Variation amongst the countries is large (see Table 2). From three countries over three-quarter of the employees responded. From two other countries, however, less than 40% of the employees answered.

Almost half of the respondents are crew members (see Table 3). A quarter of the respondents are employed on the work floor in ground services. 14% of the respondents are directors and supervisors. Again we found a variety per country. Since the number of employees per job type per country was not available we could not analyse differences in response on this level.

Half of the 1836 respondents who finished the survey needed 15 minutes to complete it (from login

Table 2. Number of responders and response rate per country.

Country	Employees	Respondents	Response
Europe - 1	1303	1009	77%
Europe - 2	539	409	76%
Europe - 3	72	45	63%
Europe - 4	572	272	48%
Europe - 5	79	62	78%
America - 1	70	45	64%
America - 2	49	18	37%
Asian/Pacific	151	60	40%
Other		1	
Total	2835	1921	68%

Table 3. The number of respondents per job type.

	Total response		Variety per country*	
	Number	%	Min	Max
Directors	70	4%	2%	13%
Supervisors	201	10%	3%	20%
Operations (crew)	931	48%	33%	52%
Maintenance & engineering	498	26%	20%	31%
Admin	221	12%	8%	20%
Total	1921	100		

* Excluding country "America - 2"

to logout). 82% had completed the survey within 30 minutes. The fact that the survey required more time than the 10 minutes for which it was designed, can only partly be explained by respondents who did not complete the questionnaire at once, but did other things simultaneously while their survey web session was still running. Another explanation could be the desire of the respondents to add comments. A previous version of this survey has been used before in another company. The current survey resulted in an unexpected high number of 2256 comments. These comments were given by 907 of the respondents, thus 47% of the respondents gave at least one comment. Printing all comments resulted in over 130 pages A4 size. Typing all these comments required more time by the respondents than was estimated while designing the survey.

6 ISSUES IN PRESENTING RESULTS

After describing the survey outline and the response, we will discuss the presentation of results for two operating companies (OpCos). The first is one of two OpCos from Europe-4, further referred

to as OpCo-4.1. This particular company focusses on aerial services for the offshore industry. 149 of the respondents of work for this company. The other OpCo is located in Europe-2. This company perform a variety of aerial services in its portfolio for which it also has a diverse fleet and many bases in the country.

6.1 *Quantitative results*

The quantitative analyses were aimed to show if there are indications of discrepancies between job types and if there exists potential resistance against a change process by a significant number of employees. We will discuss the way results were presented. In addition we address how we had to deal with anonymity of the respondents and clarification of results to the organisation. The results are shown for the first topic of block 2 'Skills and Communication'. This topic included the following statements:

– Employees are given enough *training* to do their tasks safely
– All new employees are provided with sufficient safety *training before* commencing work
– Everyone is *kept informed* of any changes that may affect safety
– Everyone is given sufficient *feedback* regarding safety performance
– Everyone is given sufficient opportunities to make *suggestions* regarding safety issues.

Figure 1 shows a graphical representation of the average score per job type for the two operational companies. The scores for OpCo4.1 vary between 3.25 (given sufficient feedback according to pilots and crew) and scores above 4.6 (given by directors for 'everybody is kept informed' and 'everybody is given sufficient opportunities to make suggestions'). For Europe-2 the lowest score (2.72) was given on average for training before by administrators, while sufficient opportunities to make suggestions received the highest score (4.02) by the directors.

A previous version of these figures included line which led to confusion. There is no ordinal relation between the five statements. Therefore, a decreasing or increasing slope has no meaning, but does attract attention. A pattern is a coincidence based on the order from left to right in which the statements are presented. The graphs presented without lines do not have this distraction. The representation of the average in a graph has the benefit that one can easily see differences. Examples are highlighted for OpCo-4.1 (see figure above) with ovals: discrepancies between groups are found especially for 'training before' (left oval) and for 'feedback' (right oval), whereas the job types agree more on
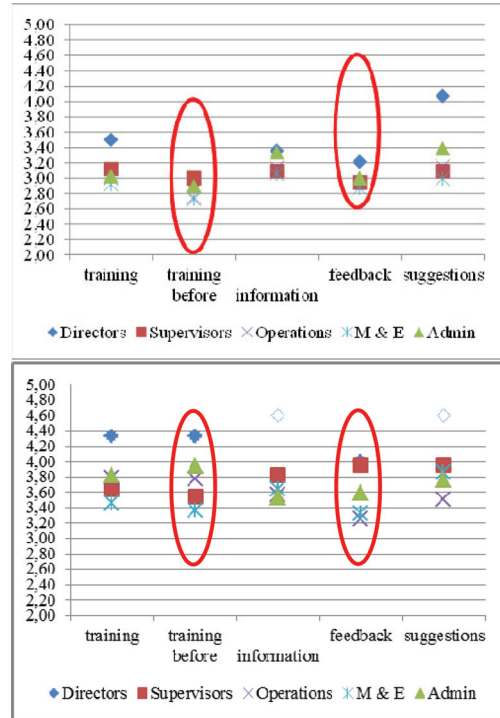

Figure 1.   Skills and Communication. Above: OpCo-4.1 (mean scores above 4.6 for "Directors and above" are marked as 4.6 in order not to violate our anonymity rule). Below: Europe-2.

getting 'information' about changes that may affect safety. For Europe-2 (see figure below) 'training before' and 'feedback' are highlighted to show that none of the job types have a positive score towards these items. The results of the safety culture survey were initially reported by means of a PowerPoint presentation per operating company. The presentation included the graphical representation of the means per job type. With these initial presentation formats the Group Safety Director could discuss the results in all the business units via the respective safety officers. Due to amongst other things occurrence of very serious incidents while running this safety culture survey the problem owner in the aviation organisation changed.

The managing directors of the distinct operating companies became the primary problem owner. They, different from the Group Safety Director are not familiarly with the methodology used. The PowerPoint overloaded them with too much information. An alternative format was developed in line with the short numerical reports managing directors normally receive. Table 4 and Table 5 show the results for the same five statements. These results

Table 4. Skills and Communication OpCo-4.1 in table format.

Q2.1 Mean Values Function	Skills & Communications To what extent do you agree with the following statements? 1 Strongly disagree ------ 5 Strongly agree				
	Directors	Supervisors	Operations	M & E	Admin
Respondents N	3	22	79	28	17
a. training	*	3.64	3.78	3.46	3.82
b. training before	*	3.55	3.77	3.36	3.94
c. information	*	3.82	3.57	3.64	3.53
d. feedback	*	3.95	3.25	3.32	3.59
e. suggestions	*	3.95	3.51	3.86	3.76

* the number of respondents is too low to secure anonymity, therefore the numeric data is NOT presented in tables.

Table 5. Skills and Communication Europe-2 in table format.

Q2.1 MV Function	Skills & Communications				
	Directors	Supervisors	Operations	M & E	Admin
N	14	34	199	123	39
a. training	3.50	3.12	3.00	2.92	3.03
b. training before	2.93	3.00	2.75	2.72	2.90
c. information	3.36	3.09	3.14	3.06	3.33
d. feedback	3.21	2.94	2.94	2.87	3.00
e. suggestions	4.07	3.09	3.15	2.99	3.38

are in fact exactly the point-values in Figure 1. The form of representation has two main differences: the tables show results for all five blocks fit on the requested limited number of pages and secondly we could not deal with the low number of respondents for the directors in the same way as in the graph. These results were left out from the tables. Whereas one could notice the directors' score of OpCo-4.1 for 'feedback' was more in line with the other job types than the other statements, this information is not available in Table 4. The tables require more processing time for the reader. To 'see' the ovals as shown in Figure 1, the reader should compare the average numbers within one row. It is a matter of taste what one prefers! However, the managing directors in this company normally gets numerical reports.

Both the graphs and the tables can be helpful to communicate about the average results and show the existence of discrepancies in judgments between the job types. However these representations are not helpful to consider if there is possible resistance. If a score of 3.5 or above is considered as positive Table 4 could undeservedly be interpreted as: all job types are positive about c) 'information' and e) opportunities to make 'suggestions'. However, one should bear in mind that an average of

3.5 will also include respondents who scored below 3 and, thus, disagreed with the statement. If only these results are presented employees, especially those who disagree with the statements, might feel not being heard if they would see a presentation with only the average scores.

The standard deviation indicates how many respondents divert from an average value. While the average value is a generally known concept, the standard deviation is not. Since the aviation organisation has a need to change, communication of the results to all employees should be easy. We felt that determining the group size of those against the statements would be easier to communicate. We made a second representation of the same results in which we focused on determining for which statements 25% or more of the respondents did not agree with the statement. The representation was meant to be in addition to the graphical or tabular representations above to highlight for which topics resistance might be expected. Resistance, disagreement with the statements, occurs for all job types.

Table 6 shows the results for the same five statements for OpCo 4.1 as was shown before in upper part of Figure 1. The table includes 146 of the 149 respondents, which are all respondents combined except for the directors. For the four job types

Table 6. Skills and Communication of the 'star system' (N = 146). Star: >25% respondents do not agree with statement.

OpCO-4.1 (excluding directors)	MV (stdev)	# not agreeing
Training	3.71 (0.919)	35
Training before	3.68 (0,924)	41
Information	3.62 (0.865)	53
Feedback	3.41 (0.915)	68
Suggestions	3.67 (0.983)	49

Table 7. Skills and Communication of the 'star system' (N = 395). Star: >25% respondents do not agree with statement.

Europe-2 (excluding directors)	MV (stdev)	# not agreeing
Training	2.99	236
Training before	2.78	284
Information	3.13	222
Feedback	2.93	259
Suggestions	3.12	213

combined the mean value and standard deviation is shown in the second column. The third column shows the number of respondents who either strongly disagreed, disagreed or where unsure about the statement. If more than 25% of the respondents (here 37 or more respondents) were not agreeing with the statement a blue 'star' was placed with the results to emphasis the statement. The table shows that for four of the five statements more than 25% where not agreeing with the statement. The results for the other operating company are shown in Table 7.

In this OpCo, more than 25% don't feel positive about all statements on skill and statements. The not positive group by far exceeds 102 respondents which is 25% of the employees who responded in this OpCo. 25% was set as an arbitrary criterion. For Europe-2 more than half of the employees did not agree with the five statements.

For both OpCos the 'star system' is not revealing specific statements at which resistance might be expected. It rather shows that resistance could be expected in general. In combination with the representation of the average scores, the table shows that the results are not only positive, thus, employees are not all agreeing with the statements.

6.2 Qualitative results

The very high number of comments expresses the concern of the respondents. The change of problem owner to the managing directors required attention. Since the proceeding of comments, see section 4, is not included in the short reports we included some numerical information (see Table 8) to draw attention to the large number of comments written by employees.

The report to the operating directors contained an additional bulleted summary of the comments for each of the safety culture topics, for the resilience questions and for the improvement question. These findings were further combined to provisional key issues which are the *areas of concern* according to the respondents of the survey. This

Table 8. Numerical information about comments. N is the number of respondents.

	OpCo-4.1 (N = 149)	Europe-2 (N = 409)
Respondents with 1 or more comments	64	209
Total number of comments	189	566
% respondents who gave a comment	43%	51%

provisional list may indicate explanation for the emerging picture of the quantitative data. For example, comments about communication issues may lead to finding explanations for the low scores by pilots, crew and technicians on feedback (see lower part of Figure 1). However, these comments are the respondents' perception. The short questionnaire was aimed for reaching a high response rate. The questionnaire only cannot be used to draw definite conclusions about the safety culture and possible subcultures in the company. Especially if comments are given by one job type, verification is needed. To verify and validate the list of preliminary key issues above interviews in OpCo-4.1 have been conducted with employees. These interviews should complement the results from the questionnaire in order to understand its findings and put these in perspective. The additional interviews should also provide angels form formulating an improvement strategy. While verifying comments on lack of essential personal protection equipment (PPE), it became clear that management had a project running to determine what brand and features such specific equipment should have for a longer time. However, management did not actively communicate about this project to pilots and crew members. Communication should keep relevant people informed and indicate when employees may expect a decision on, in this case, their PPE concern. The issue 'essential equipment and PPEs' was found to be an example of a specific communication issue in this OpCo. The list

of key interviews after the interviews included the following topics:

– Communication
– Reporting and feedback
– Reported & acknowledged high-risk issues treatment
– Blockers in learning from flight performance
– Shift system in maintenance
– Protocol development—maintenance and quality assurance
– Training programme
– Appreciation of personnel performance
– Visibility of management at the work floor
– Morale of personnel.

Each of these issues were rooted in practice and provided opportunities for change in this operating company.

Employees of Europe-2 gave more comments, which is in line with their lower scores on the questionnaire than respondents from OpCo-4.1. In Europe-2 no interviews have been done yet to find further explanation for the issues mentioned by respondents. Only via interviews we can put comments such as 'crew competences', 'role of the middle management' and 'health and safety issues' in perspective. The list of primary key issues for Europe-2 included:

– Training of crew is not standardised, leading to differences in competence building of trainees.
– Selection (and training) of competent crew.
– Lacking standard operating procedures for critical missions.
– The adverse consequences of submission of a safety report, resulting in fear, transfer to another base at the side of pilots and technicians, and many unresolved safety problems.
– HR department's functioning and relationship with personnel needs revision and improvement
– Coming to terms with unions on contracts for personnel.
– Clarity about payment of wages and expenses, including payment dates.
– The current influence of marketing & HR departments on terms for operations and crew scheduling increases operational safety risks: needs revision.
– Fatigue risk management is urgently needed, but fully lacking.
– Crew job function, qualification and competence, as well as personnel development currently not at all based on merits.
– Lacking means, tools and PPEs in aircrafts and maintenance.
– Role of middle management and commanding pilots.
– Management commitment, support and visibility at frontline bases is poor.

– Reported problems are consistently not solved, and lessons are not learnt.
– Health & safety at maintenance work places.

Some issues such as lack of training, lack of visibility of management at the work floor and lack of learning from reported problems are areas of concern in both operating companies. The comments from Europe-2 indicate organisation issues relating to working conditions and possibly a culture of fear. Further analysis showed that the comments came in particular from one business unit in Europe-2. This business unit showed even lower scores on the safety culture and resilience questions than the other units in this operating company. The results of this OpCo show that one should be careful at what level of the organisation safety culture is assessed. At the company level we may overlook systemic underlying issues in one of its business units.

7 DISCUSSION

Based on HILAS work, we have tailored a short safety culture questionnaire and launched it globally within an aviation organisation that operates in 3 continents in 8 countries in 5 languages with many different types of aerial missions. The survey was meant to be fielded with a high response rate and should help the company to invoke change processes to improve safety and overall performance. The overall response rate of 68% is reasonable. However, the difference between countries is large. Apart from differences in response rates the attitudes differed between countries and even between business units within the same operating company. One should be aware of such potential differences in deciding at which organisation level to analyse the survey results. The comments were found to be useful for indicating potential explanations of the scoring of safety culture and resilience statements, and for identifying areas for potential improvements.

The scope of the survey is a resilience safety culture to strive for by the company as described in (Akselsson et al., 2009). Originally, analysis of the data would be followed by interviews, to start with Europe-1 and Europe-2 in the first phase. The outcomes would be discussed with the Group Safety Director (the initial problem owner) and be used as a lever in the forthcoming change processes: nice and 'quiet' action research. This first survey would become a benchmark for future surveys, of which the second one should be launched 6–12 months after the first one.

The survey has not been used in the way it was meant to be. The envisaged relatively 'quietness' was drastically ruptured by a series of serious accidents in different operating companies that started

just before the launch of the survey. These events put a high pressure on the survey in order to gain rapid insight into cultural and underlying systemic issues as input to change operations. The problem ownership shifted from global level to the level of operating companies, so that reporting requirements also changed (initially without any specification). The pressure on our initial problem owner was so high that we have not been enabled to discuss any of the intermediate reports properly with the client or a representative, except regarding the one operating company in Europe-4 that got first priority after a serious incident.

It is in this process that it became crucial to develop a reporting format that would be usable despite the unfavourable circumstances. These included briefing of managing directors, the new problem owners, to ensure that they understand what is presented. The first safety culture survey combined with the audit of the SMS in each operating company was essential in making managing directors aware that they had serious problems. Secondly, enriching our own insights in the daily operations and circumstances of this organisation while the survey and later the analysis was running. Finally we are limited due to cancelling of interviews resulting in lacking of verification and validation defines systemic issues in perspective of the operating companies. Despite these difficulties, we have now an effective reporting format aimed at CEO of operating companies. We have discussed the development in time of the representation of statistical data from graphs into tables, and from themes in comments to lists of key issues, supported by an extract of comments that illustrate climate and culture within an operating company. The reports initiated 100-day change processes which were started up country by country. Running these change processes removed the urgency of the company for a benchmark report after the first survey. However to reflect on these change processes interviews and the benchmark is still valuable and needed.

The second survey is considered for the summer of 2013, after all 100-day change processes have finished. This second survey is expected to show great differences in scores and comments. Right now, we might say that the action in 'action research' has been overwhelming in the first phase about up to now. The 'research' part shall hopefully get more room in the subsequent survey.

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