ORIGINAL ARTICLE

Day-to-day performance management in a small regional airport and management of change for safer operations

M. C. Leva · D. Del Sordo · F. Mattei

Abstract The paper presents a change initiative run in a small regional airport urged to face the challenges of the current competitive environment in commercial aviation. The initiative was directed toward providing a more systematic framework for performance management with a specific focus on safety in day-to-day operations. The initiative also leads to the development of a new IT system configured as a database to support, monitor and analyze day-to-day performance of the key activities of the airport (such as the turnaround process). The tool, still partially under development, also supports the management of the safety assessment of existing and planned operations, according to the aspects specified by the ICAO Safety Management System Manual (2009) [i.e., (a) the need for proactive actions and safety assurances, (b) performance evaluations, review of safety assurance documents, audit reports and compliance with instructions, specifications and regulations]. Finally, the tool was also directed toward supporting the establishment of a new integrated SMS within the small regional airport that supports performance and tackles all the areas needed such as performance monitoring, reporting, task support, procedure documentation and proactive risk assessment. The tool has been built using a participatory approach around a shared and documented understanding of the key activities the organization needs to be able to perform safely and efficiently.

M. C. Leva (✉) · F. Mattei
Centre for Innovative Human System (CIHS), School of Psychology, Trinity College, Dublin, Ireland
e-mail: levac@tcd.ie

D. Del Sordo
Societa' Abbruzzese Gestione Aereoporto (SAGA), Via Tiburtina Valeria - Aeroporto di Pescara, Pescara, Italy

1 Performance management and organizational change in a small regional airport

1.1 Setting the scene

The initiative discussed in the present paper within a small regional airport was part of a larger project called MASCA. The main objective of MASCA was to deliver a structure to manage and support the acquisition of skills and knowledge for managing change. Airports are an essential part of the air transport system and they also have a role to play in the process of increasing the quality of life of regional and local communities, directly participating in wealth creation (Scotti 2011). The topic of airport performance has gained increasing attention from researchers, especially in the business area (Button and McDougall 2006) given the strong growth of demand in the aviation market and the recent liberalization process implemented in many airports and airlines which were previously state owned. These recent events have also determined an increase in the level of competition between both airlines and airports. As Scotti (2011) points out, performance evaluation and improvement studies of airport operations have important implications for a number of airport stakeholders: (1) for airlines in identifying and selecting the more efficient airports at which to base their operations, (2) for municipalities because of the benefits coming from efficient airports in terms of attracting business and passengers and (3) for policy makers in making effective decisions on optimal allocation of resources to airport improvement programs and in evaluating the efficacy of such programs.

Italian airports before 1990 were controlled by the national government, as in many other European countries. The first important change was the Act n. 537/93 which allows airports to be partially privatized. The management of airports was delegated to private companies, local governments (regions and counties), municipalities and chambers of commerce. The law also stated that the stake of shares of the company managing the airport not in the hand of private agents had to be at least equal to 20 %. As a consequence, the majority of the airports are still in the large majority under the control of local governments. In 1997, a new Act (n. 521/97) eliminated the 20 % minimum stake for local public governments and created a national public authority—ENAC—in charge of the sector's regulation.

This authority commissioned in 2010 a study on the profitability and future strategy of airport services in Italy (Cillis 2010). According to the study, twenty-four current airports are considered to be non-strategic and therefore should not to be financed using public money. To avoid the possibility of not having a renewal of the license issued by ENAC to operate as an international airport, the regional airports have to increase their traffic significantly and at the same time ensure safety of operations.

The Airport Council International (ACI) requires airports to participate in a benchmark exercise that pushes organization to clearly specify goals and performance indicators connected to them. The benchmarking of an airport's performance against other comparable airports is to be used as a reference in the difficult task of ensuring competitiveness.

Some of the goals proposed by the ACI document are around traffic activities (e.g., total passengers, cargo), physical facilities (terminal gates), aeronautical charges, quality of services, etc.

When the regional airport started the project, the data internally collected by the organization were mainly paper based and ad hoc (e.g., through periodic surveys on customer satisfactions), able to substantiate only few of the KPIs proposed by ACI (2006). Even the data around performance on core operations for flight turnarounds (the so-called trip file) were partially collected manually through the uses of checklists regarding the tasks performed for each flight. Similarly, reports regarding safety were only manually collected, it relied on paper reports and periodic audits, but there was no process in place for required follow-up analysis and implementations. No proactive risk assessment was actually performed on procedures and activities unless expressly required by the regulator to approve new procedures.

To ensure continuity of licensing with the civil aviation authority in Italy, the airport needed to establish a safety management system for existing and planned operations able to cover the areas required by the ICAO Safety Management System Manual (2009) which is to say:

- The need for proactive actions and safety assurances;
- Performance evaluation, review of safety assurance documents, audit reports and compliance with instructions, specifications and regulations.

1.2 Other issues affecting change in the airport: the cultural challenges and the MASCA approach

The problem facing the airport, therefore, is the requirement for a critical change of the modus operandi within the company on a day-to-day basis. Literature on organizational change demonstrates that, against different criteria and outcomes, only a minority of major change initiatives (typically between 30 and 50 %) have a positive outcome (Dent and Powley 2001; Porras and Robertson 1983; Kotter 1995). Change is necessary, but it is risky even in a small organization. Burnes and Jackson (2011) highlighted that a potential reason for this high failure rate is the lack of alignment between three factors: the value system of the change intervention, those members of the organization undergoing the change and the approach or process by which it is managed. Further research suggests that change is a collective learning process and that organizations should manage therefore uninterrupted learning cycles around their initiatives (Schimmel and Muntslag 2009).

It is vital therefore that the reasons for organizational change are understood and shared by the people both responsible for and affected by it. Further, it is also important that a suitable approach for its enactment is carefully chosen and tested in action.

As McDonald et al. (2011) pointed out, organizational culture has a dynamic role in maintaining system stability. Qualitative change in collective understanding may only come after a cumulative aggregation of many minor shifts in the way a social group make sense of their situation; the shift may then be rapid and volatile; this is why the importance of consolidating and embedding change is so often emphasized.

As culture cannot be directly "managed" or controlled, attempts to do so often create an unofficial counterculture (Kunda 1992). So if culture cannot be directly 'managed', equally it cannot be ignored. But culture potentially includes everything; therefore, it is important to be able to focus on those aspects and phenomena that are relevant such as goals, vision and values; the perception of the system and its functions, often called climate; subcultures differentiated by roles and boundaries; and the quality of engagement between people and organization, including dimensions like trust or alienation.

Within the safety management literature having a good safety culture, climate, etc., often seems to be proposed as a criterion of good safety management. Murphy et al. (2014) in a paper about how macro-ergonomics can guide organizational interventions firmly stated that in order to achieve a high safety climate where safety is paramount, the system elements and levels must be aligned, so that all aspects, including equipment, production/work processes, policies and communication, fulfill the goal of creating a safe, productive work environment. For a cultural measure to perform this function effectively, it has to be grounded in a demonstrated relationship to the functioning of the system it represents; the levels of knowledge and expectations need to be taken into account, as these can reverse predicted relationships. Culture can be seen as the active engagement of a collective in a process of change. The cultural analysis then can become part of the change process.

A classic approach to cultural analysis is to seek to establish fundamental meanings and values. Here, the aim is to construct a rich in-depth interpretation from a broad range of material. While this may not be particularly useful from a short-term perspective in managing change, it can be extremely valuable in developing a strategic view of some of the challenges that need to be faced in changing an organization in the long run.

2 Action research for managing change in the regional airport

The small regional airport engaged 3 years ago in a EU project called MASCA about management of change in aviation. In approaching the problem in each of the industrial partners involved in the project, the research team required a "forensic and in-depth" insight into each of the companies' current strategic and operational approaches in order to identify, understand and assess their needs to implement and effectively evaluate change.

The various visit of the members of the research team at the airport involved:

- Structured interviews and observations with key stakeholders
- Documentation analysis
- Introduction focus groups aimed at building an internal MASCA improvement team
- Triggering ideas by providing examples of possible support tools in a MASCA change management system

The structured interviews were used to perform a preliminary analysis of the industrial partners around three main areas that a change management system should be able to address:

1. *Strategy* An insight the organization's relationship with its environment, the goals it has set of itself, and how those goals are also communicated and used with the member of the organization.
2. *Process* What are the minimal conditions for being able to purposefully change a functional system? It is necessary to understand its processes which means to be able to know how the system works or function as well as to be able to track what it is currently doing. The process model derived also needs to be sufficiently well defined and grounded in the operation to be meaningfully linked to real operational data measuring, concurrently, system inputs, activity and outputs.
3. *Competence* The argument about change highlighted two prevalent problems: the insufficient competence within organizations to manage complex change involving human, social and technical systems, and the lack of a good practical theory to support professional and managerial practice in this area. Therefore, it is useful to understand what competence profile was being pursued by the small regional airport itself.

The action research approach adopted within the project aimed at identifying interventions that would actually be of use for the industrial partners. To pinpoint areas in need of improvement, the researchers needed to start establishing as much as possible a relationship based on trust with the key stakeholders in the organization so as to be able to also understand the values underpinning their interaction with the organization. Furthermore, the presence of external researcher and their capacity to interact with the workers was likely to affect the way those workers would think about the future and their expectations. By pointing to certain issues, the researcher in an organization is in fact able to stir things up a little and it is only by trust that an organization and the individual in it may give access to weak spots that are normally left in the dark. The evidence suggests in fact that the particular combination of internal and external change agents can be critical to the success of change initiatives (Pathak 2010).

Operational organizations, unlike large design and manufacturing organizations, are normally without research and development departments; thus, collaborative research and development with research institutions can provide an effective innovation process to compensate for this. However, for this to work, the collaboration has to deliver benefits to meet the short-term operational or organizational goals of the participating organizations, as well as the medium- to long-term research goals of a project. This fits well within an action research framework that concerns the implementation and evaluation of change, as well as the analysis and measurement of operational parameters like performance and risk.

2.1 Results of the structured interviews

During the initial site visits, it was already possible to interview 18 people from various roles (the airport counts around 40 employees in total, 24 of which are employed on ground operations) to identify some of the underpinning values and the employees suggestions about possible areas of improvement.

Regarding the area of *Strategy* in the interviews, it emerged that as the airport is owned and supported through the local government and related institutions (regions and counties, municipalities and chambers of commerce), its strategy has often been influenced by political vicissitudes with no clear long-term strategic objectives to increase the profitability of the company. This and the consequent lack of transparency resulted in the fact that at the beginning of the project 90 % of the operators interviewed said that they did not have a clear idea of the strategy of the company and that they did not receive any clear communication about it.

The same applies to the communication of the objectives and measurement for those objectives.

However, 85 % of the employees interviewed had a clear understanding of the challenges the company needed to face and they were genuinely supportive toward them.

Those challenges can be summarized as follows:

- Increase number of passengers (either we grow or we die!!)
- Increase number of airlines and cargo
- New destinations requested (e.g., Turin)
- Increase return on commercial side of business
- Restructure the company to make it profitable, lean and effective (measure and account for better performance)
- Team up with the region tourism association to increase incoming and outgoing traffic and justify the public contribution with the return on investment achieved in tourism.

Regarding the area of *process*, the main issue highlighted was that the management of normal activities was often perceived as fire fighting, especially during the busiest periods (e.g., summer and spring). The majority of the employees interviewed pointed out that there was no clear assignment of roles and responsibilities for each turn and that they felt the lack of an airport duty manager. 70 % of the employees interviewed proposed the use of shift planning around each flight, like it was exceptionally done during crises (extra incoming and outgoing traffic due to exceptional events). It was also suggested a more systematic and IT-supported approach toward the automatic collection of performance data on the turnaround of each flight (which was only manually collected on the trip file).

Around 80 % of the employees interviewed reported the lack of a clear form of performance appraisal, and they suggested initiating one.

As part of the initial in-depth analysis, the researchers started to:

- Process map main processes as they could be useful to provide input into what is currently being done for what purposes, by whom and with what tools.
- Collect data on existing KPIs (e.g., delays, cost per passenger, expected return per passenger, etc.)
- Involve employees in improvement programs meeting staff within each area (operations, ramp, etc.) meeting with managerial level more regularly, recording decisions on possible action items and progress made.

Regarding **competency**, the people interviewed were happy about the training provided by the organization as it allowed for required appropriate certifications and enabled most workers to be flexible and cover many positions. What they pointed out as missing is:

- The monitoring of actual tasks covered to make sure that the skills are appropriately retained through experience
- The lack of performance appraisal and performance feedback to workers.

At the end of the initial site visit, a small focus group was organized to try and identify the basis of the issues and highlighting a list of possible objectives to concentrate on for organizational change to be followed with the support the external researchers. The process followed was participatory in nature; the researcher distilled possible improvement initiatives from the transcripts of the surveys. They subsequently listed them and presented the results of the survey in workshops involving all the employees interviewed. The employees were then asked together with the management to rate in a scale from 1 to 5 the importance they wanted to assign to the initiatives proposed and giving reasons for results. The average scoring obtained was used to rank them. This process was followed as to ensure a collaborative approach in the action research project form the very beginning. The list of initiatives proposed during the focus group is reported in Table 1.

A follow-up session of interviews was arranged some months after the initial meetings, and 22 additional employees were interviewed. The results confirmed the first survey and the prioritization given in the list of possible change initiatives.

Table 1 Summary of possible change initiatives identified with priority assigned from 1 to 5

Priority	Needs
1	Establish meetings with various levels of management to receive feedback from field and communicate strategy and plans from the top
2	Establish a database to monitor and analyze day-to-day data to be collected in relation to performance
3	Establish also a database to support the management of equipments and infrastructures
3	Improve the team work for each shift by identifying a clear shift supervisor for each shift everyday
4	Provide ramp agents with a pc connected to the operating system used to enable to see real-time workload for flights, etc.
4	Improve team work by assigning clear roles and responsibility for each turn, written assignments are preferable so as to keep track of competencies as well)
4	Use a formal way of evaluation for personnel
5	E-mail for each employ to facilitate communication both vertical and horizontal (peer to peer) (mailing list for each area)

3 Performance management: a step-by-step change with long-lasting implications

3.1 What is performance management

In order to be able to purposefully change a functional system, it is necessary to know how that system works or functions as well as to be able to track what it is doing. This knowledge of functional activity needs to be sufficiently sophisticated to understand what needs to change in order to make the system work better. Finally, it is necessary to know how to implement that change. Fulfilling these conditions is a necessary requirement to have leverage over the future performance of the system, which is the purpose of performance management. The main steps followed to start a performance management approach within the company are as follows:

1. The mapping and the analysis of the main organizational activities
2. The monitoring of how the organizational activities are going
3. The identification of what needs to change
4. The evaluation of that change (which is a point linked recursively to point 1 and 2)

3.2 Mapping the organizational activities

Knowing how the system works involves modeling the relationships and dependencies (technical, social, informational) in the system. These govern the transformation of resource inputs through process activity into outputs. That is why one of the first steps performed in addressing the reality of the regional airport under analysis was to map its main processes and activities and detail the information flow that complements those operations. This baseline analysis was performed using a process mapping and analysis tool developed within the project according to the following steps (Fig. 1):

1. The macro-analysis of processes begins with defining process objectives
2. Define macro-tasks for achieving macro-objectives

   (a) It is possible to define also a people map for the macro-task (organizational chart)

3. Start defining subprocesses for each one of the macro-tasks

   (a) Define task map
   (b) People map
   (c) Info map
   (d) Material map

4. Define KPI for each objective on the macro-task or on the micro-task. Each objective on the micro-task is associated with a macro-objective on the macro-map. The user is also asked to input a measure of importance, which is a percentage from 1 to 100, for each micro-objective in relation to the macro-one.
5. The relationship and the importance can then be used for displaying the results in a balance scorecard analysis provided by custom-built software that can help identifying possible incongruences (Table 2).
6. In the people map, it is possible to define teams and groups and associate the available roles to each of them. Some roles may belong to the organization, and some may be external actors. It is also possible to have an overview of all the tasks associated with each role. This is done to evaluate workload (this view can be used to interview each role and ask them what percentage of time they have to invest in each task).
7. For each role, it is also possible to view all the information that he/she has to provide and to who it has to be provided and all the information that he/she
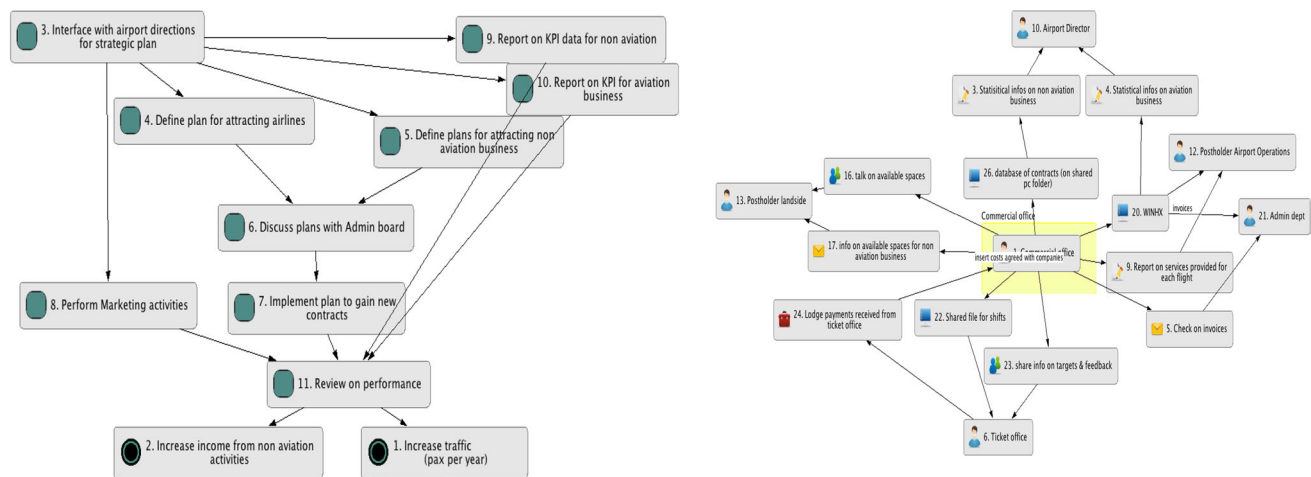
Fig. 1 Example of process map and info map for the commercial department in the airport

Table 2 Template used in the tool for KPI analysis

Macro-OB KPI	Macro-objective	Micro-objective	Micro KPI
KPI 1 OB 1	OBJ 1	Micro-ob 1	Micro KPI 1
KPI 2 OB 1			Micro KPI 2
		Micro-ob 2	Micro KPI 3

has to receive and from whom he or she has to receive it. This could be useful to evaluate possible needs to provide more efficient IT support for information exchange and analysis.

8. The software also provides a hazard analysis module connected to each process map.

The hazard analysis module of the software tool has been designed to respond to the need of analyzing the possible safety critical deviations that can occur in a process, assess their risk and identify safeguards in terms of preventive or mitigating safety barriers. In this way, possible gaps and criticality in the existing processes and procedures could be identified and corrected.

Each hazard analysis window is specifically linked to each module of the overall project process map, and each task in it is to be considered as a node. On the higher part of the screen, the user can see the task model to be analyzed, while at the bottom the tool presents the table that contains the analysis (Fig. 2). The analysis starts with the selection of a node. Then, the user can input the deviation expected for the node using a list of keywords highlighting the main aspects of a socio-technical system were critical deviations may arise (main process analysis parameters). The key words (parameters) used in the tool allow analysts to be systematic in identifying and categorizing all possible deviation. Then, consequences and causes of the deviations are inputted and classified, severity and likelihood of the

scenario identified in this way are then selected, and a risk index is assigned based on a risk matrix whose categories can be customized by each company. Lastly, the analyst may assign a recommendation for the deviation analyzed. Those recommendations will then be collected and evaluated further in a separate section of the tool aimed at turning them into projects for actions (Fig. 2).

3.3 The importance of monitoring how the organizational activities are going

The model also needs to be sufficiently well defined and grounded in the operations to be meaningfully linked to real operational data measuring system inputs, activity and outputs. Different types of data, from everyday operational indices to in-depth analysis of rare events, should be integrated to provide knowledge of the relationships between normal and abnormal functioning of the system. These relationships define the risks inherent in the system and form the basis for estimating future risk following system change.

The requirement for a tool to support this monitoring activity, in connection with the needs highlighted by the personnel interviewed around performance monitoring, led to the user-centered design of a new tool to collect the day-to-day performance data on the core business area: the turn-around process of aircraft arrivals and departures. The tool was aimed at seamlessly integrating information regarding issues and threats managed day by day from one shift to the next within the normal operational checklist data that were already collected manually on paper (Fig. 3).

3.4 Identifying what needs to be changed

An objective of change is to reduce the risk the organization faces in meeting its strategic challenges, comparing
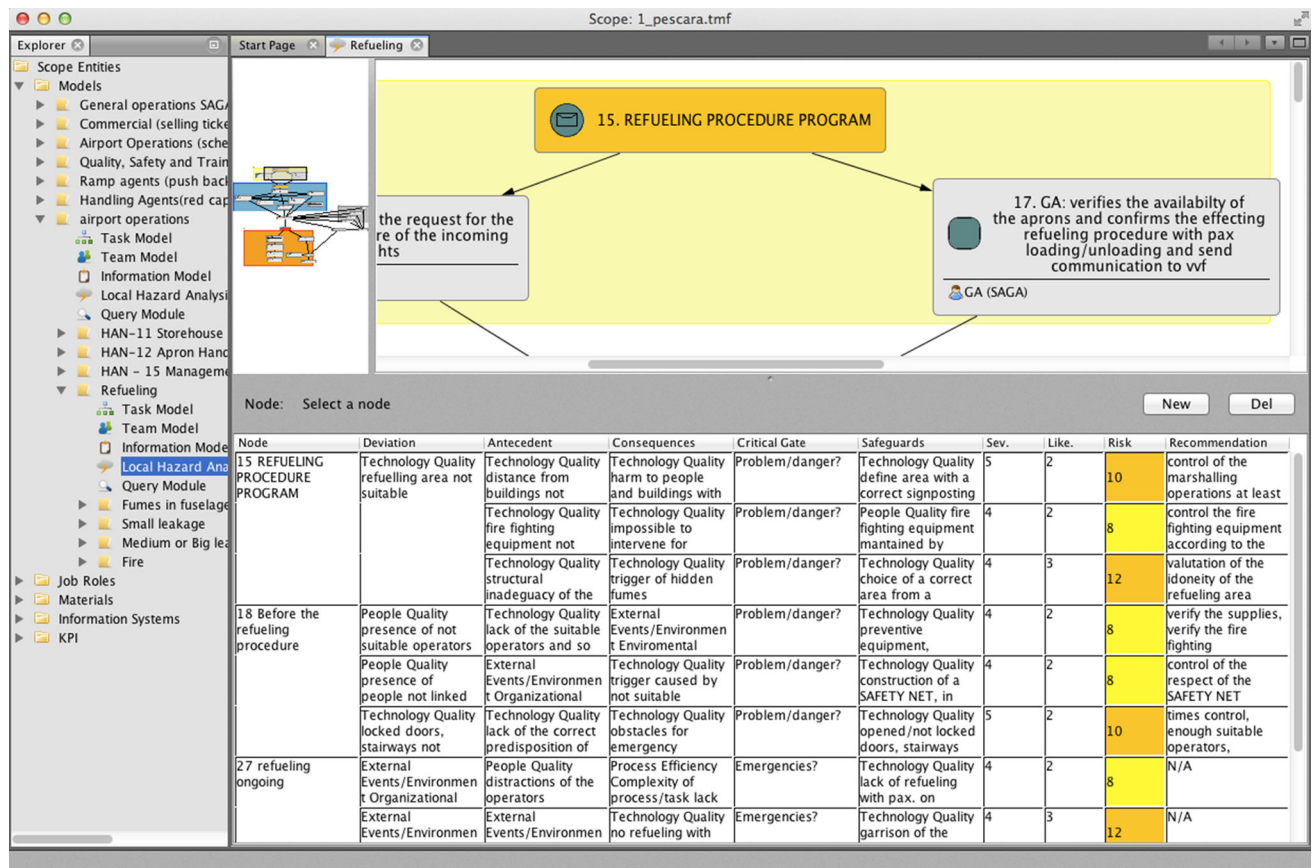
Fig. 2 Screenshot of the tool used for risk-assessing processes and procedures

Fig. 3 Example of mock-up used for the shift handover in the daily journal at the airport (in Italian)

current performance to projected demands. Reporting, investigation, audits, data gathering set off a sequence of management processes that can transform this information into actual system change. To do so, the steps are first a systemic assessment of risk leading to the definition of recommendations for acting on those risks, and then, the implementation and evaluation of the effectiveness of the actions taken.

The objective of risk assessment is to represent all analyzed risks in an integrated risk register that prioritizes the areas in which the organization has to take action to improve its systems and processes. Each incoming report

or data point that exceeds some preset boundary receives an initial risk assessment to prioritize its status and identify urgent actions to be taken. One or many reports or data sets may then be combined to form "projects" which represent a common problem space. Two complementary types of risk analysis can then follow:

- Investigation and other qualitative analyses
- Analyzing probabilities of "cause and effect" in operational data and/or reports.

The outcome is a synthetic picture of system risk from multiple sources of data that can be used to prioritize policies and programs for change and redesign. To support this aspect, the researchers used the tool illustrated in the previous chapter (see Fig. 2).

4 The actual intervention for performance management in the regional airport

The first intervention was aimed at verifying with the user the information to be collected in a day-to-day data collection system. Further, it was also decided to try a user-centered design to test with the users various different ways of performing an enhanced version of the data collection previously done on paper. Following this initial stage, the mock-up was transferred to a computerized application able to connect to the existing company admin databases.

4.1 Managing daily journal for the airport: trip files for each flight and shifts handovers

To start the process, a mock-up was built to single out all the data that needed to be migrated from the paper format of the checklists used by ramp and operations for each flight into an electronic format.

Further, the data collected were extended to incorporate the management of small deviations and anomalies. The previous paper forms were simple checklist that did not collect any info regarding who performed a task, if the task had any issues or if there was the need to pass on any follow-up or request for interventions from one shift to the next.

The checklist has now been restructured around the subtask performed for ramp and handling operations identified during the process mapping exercise. Furthermore, it is possible to record who is in each shift and who are the shift leaders, and any possible anomaly that might occur during the operations and its associated criticality level and follow-up. The analysts reviewing critical anomalies can suggest to escalate them into an actual mandatory occurence reporting if required.

4.2 Managing airside and landside inspections, results and follow-up

This section of the tool is still to be finalized. The Post Holder for Maintenance in Landside uses a form every day (a checklist) to check what items are not working as expected or are not in proper order.

The follow-up process on what gets solved and how is currently managed informally.

The proposal is to have the results of the checklists recorded on the Daily Journal. The criticality or severity of the issue is also to be recorded together with the recommendations suggested and the roles assigned for the evaluation of those recommendations.

The Post Holder for airside also requires daily inspections on the status of airside infrastructure and the runaway (e.g., to mitigate birds hazards and the risk of possible foreign object debris: F.O.D.)

The new system could help in reporting the inspections results and manage the follow-up in much the same way as needed to be done for the landside Post Holder.

Both Post Holders could then participate to daily briefing with the airport duty manager to assign responsibilities for the necessary short term actions to be taken.

4.3 Managing periodic quality and safety audits and reports, results and follow-up

The airport personnel already has to perform periodic quality and safety audits. The results of the audits are currently stored in excel spreadsheets and analyzed on an ad hoc basis.

The possibility to include the audit findings and the follow-up requirements in the same pipeline used for the day-to-day data will provide a much wider scope for the efficiency of managing continuous improvement initiatives and identifying needed synergies. Similarly, the safety and quality ad hoc reports are to be included as an extra source of information into the same database fed by the daily journal.

4.4 The issue of strategy and communication in the airport

To tackle the more high-level issue of strategic planning and communication within the company, the Airport Director is also going to discuss with the Airport Administrative Council possible ways of structuring a clear approach for performing strategic planning within the airport and a useful way of improving the involvement and the communication with employees. This is a more long-term process involving the building of a reasonable level of trust between the upper management level and the

operators from the field that still need to be negotiated through the not so linear paths of a partially state-owned organization. However, the organization has now established a "Management Review and Safety Board" which held a periodic review meeting for managers of responsible areas in charge of necessary actions following anomalies and accident/audit reporting for safety quality and operations. The results of those periodic meeting should then be posted as notices on the daily journal so as to ensure better two-way communications and feedback. The survey has in fact highlighted that the middle managers involvement and a more proactive communication is a critical factor for the success of the initiative.

4.5 Day-to-day data collection and the long-lasting implications on safety management

Various studies on organizational-level under-reporting linked the issue to multiple factors like the general safety climate, the specific industrial, sector, the company size and the perceived lack of management engagement (Clarke 1998; Heinrich 1980; Probst et al. 2008; Zohar 2003) at individual level under-reporting has been ascribed to factors such as fear of reprisals, loss of benefits or a fatalistic attitude that injuries are a fact of life in certain lines of work (Pransky et al. 1999).

In another study, Clancy et al. (2011) identified three factors as relevant causes for under-reporting:

1. A definition of near misses and safety training proposed centrally and not immediately relevant to the issues normally encountered on site
2. A reporting framework mostly perceived as extra paper work
3. The poor feedback on reported problems and the perceived detachment from operational issues.

The new reporting framework introduced in this change initiative will be embedded in the checklists that are already used as part of the normal daily operations for all the operators on site.

The advantage of using existing tools for near miss and in general event reporting is that the use of ad hoc reporting forms fails to provide a real-time picture of routine operations supporting performance management and predictive risk management. Further, the use of many discrete tools implies that much valuable data gathered about operations are stored and analyzed in different formats and by different and often disjointed departments. This makes it difficult to obtain an integrated risk registry (Leva et al. 2010).

These data have the potential to identify latent hazards in plant, equipment and procedures that may otherwise go unnoticed. The data collected about non-conformances can be then classified collectively, independently from the point of origin (daily journal, or daily inspections, or periodic audits and once off reports).

Furthermore, the system will also allow a more structured approach to follow-up. As part of this the tool should be able to provide support for important communications as for example the feedback to the reporters on the status of their reporting and on the actions taken thanks to that. This is in fact considered to be an important motivational factor.

4.6 Development of a tool to support performance management: daily journal (DJ)

The system has already been partially built as a management system, and it is configured as a Web application. The application is connected to the existing company's databases and can show all required data using an interface password protected. The ongoing work is to complete the remaining features needed to cover the full cycle for performance management support (Fig. 4).

The new functionalities to be developed are as follows:

- Online repository of procedures directly derived from the process mapping.
- Review of procedures and processes performing participatory risk assessment (it takes the shape of structured hazard identification exercises focused on each area of the airport operations manual). This will lead to the initial shaping of a risk registry for the main activities of the company to be further updated with risks identified through reporting and periodic reviews.
- Management of recommendations coming from reporting and updating of risk registry through suggestions of the "Management Review and Safety Board"
- Management of corrective actions

5 Interim results of the change initiative

The new reporting framework introduced in this change initiative has the advantage of being embedded in the forms that are used as part of the normal daily operations for all the operators on site.

This advantage should help to provide a real-time picture of routine operations supporting performance management and predictive risk management; further, the new tool should seamlessly integrate in a common pipeline the monitoring and completion of all follow-up action required avoiding the problem of storing valuable data gathered about operations in different formats to be managed by different and often disjointed departments. This should make it easy to obtain an integrated risk register.
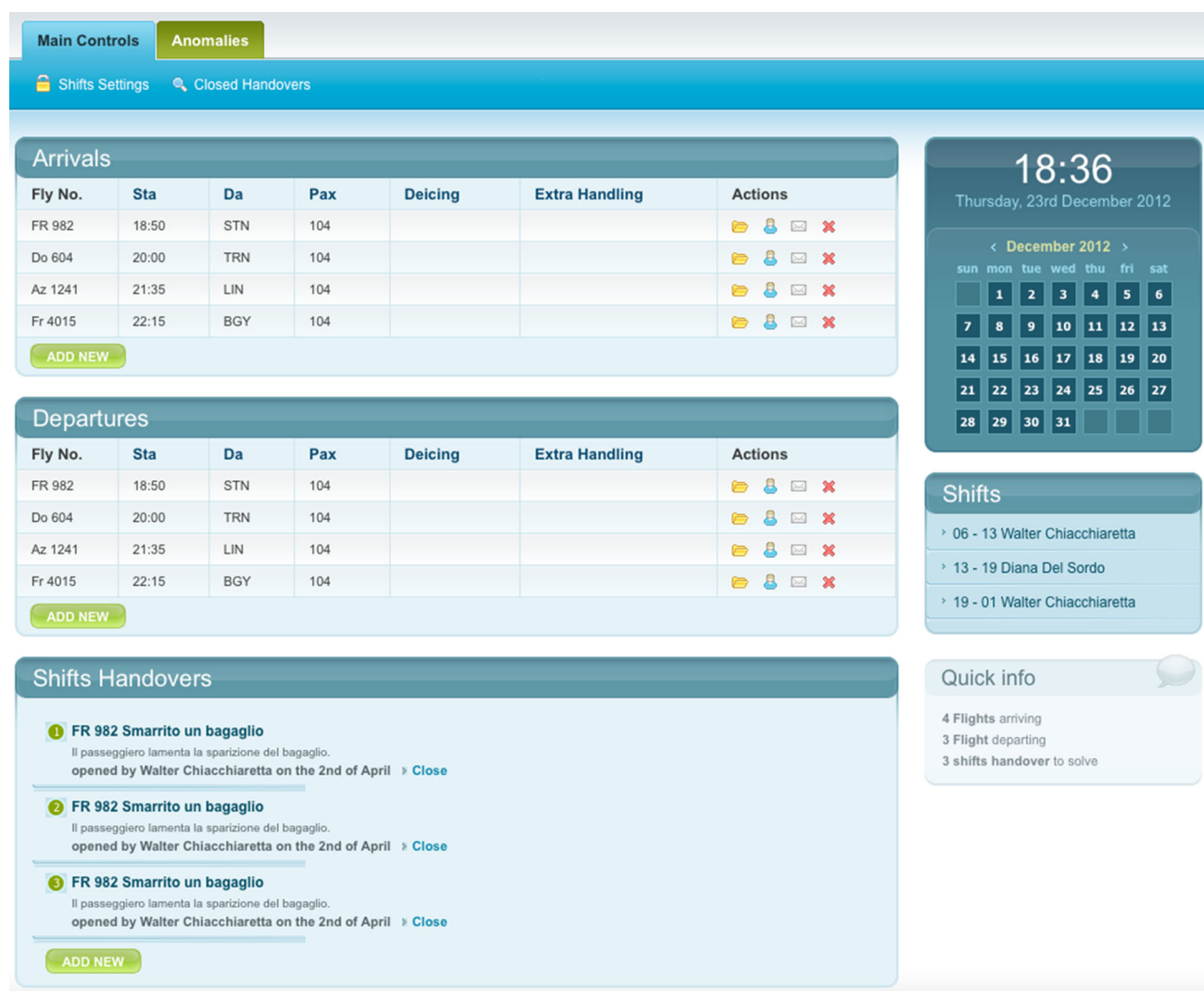
Fig. 4 Screenshot of the daily journal currently deployed at the airport

These data have the potential to identify latent hazards in plant, equipment and procedures that may otherwise go unnoticed and will also provide leverage on the everyday performance management much needed within the context of the business for the company in the long-term strategy of growth pursued. The rate of reporting increased from 40 accidents reports in the previous 6 years to 209 anomalies collected with the trip file plus 201 issues reported through the shift handover in the first year using the integrated method. Interim feedback has been collected about the tool during training and evaluation session that took place in March 2013. Very positive feedback was provided from all the participants about the initiative and about the use of the new tool (Daily Journal) itself. It is perhaps interesting to report comments made by some of the ramp operators: "by working on these check-lists and filling out the form with

the tasks and the name of the agent who carried out the activities, we have become more conscious of our role, more aware about the essential aspects of our tasks" or "It is something everyone sees, something everyone deals with everyday but when you change your perspective and method of work (e.g., with the daily journal) or perform a risk assessment by working in teams with different departments, (as we have done during the human factor training sessions) something begins to change in the way you perceive what you do and your context." The possibility of obtaining interim successes has a very important role in change initiatives as Kotter (1995) noted "Real transformation takes time and a renewal effort risks losing momentum if there are no short-term goals to meet. Without short-term wins, too many people give up or actively join the ranks of those people who have been resisting change."

Key success factors in the achievement of interim successes for this specific change initiative have been:

1. The enthusiasm and the proactive attitude of many ramp/operational agents; the desire to change work methods and practices including the desire to test a new way of appraising performance, different from the obsolete methods of evaluation.
2. The support of top management, who also showed a proactive and positive attitude toward the MASCA initiative, despite the need to "weather the storm."
3. The possibility of keeping records of data collected over time; an overall evaluation of all processes of work and evidence of anomalies to be managed integrated in the day-to-day data collection as opposed to a separate systems of safety/quality data monitoring.

5.1 Evaluation of the change initiative within MASCA

The main objective of MASCA was to deliver a structure to manage the acquisition and retention of skills and knowledge, through training on organizational processes for managing change.

As part of this objective, the action research team had to evaluate the deployment of the main principles around change management promoted through the project in selected change management initiatives. The main areas that a change management system should be able to address, and whose status was preliminary assessed with the initial structured interview:

1. The strategy of the organization and its capacity to communicate and enact it, which is also to be reflected in an assessment of the social cohesion of the organization.
2. An assessment of the logic of the current processes the company runs to function.
3. The assessment of the knowledge processes and the competence at both organizational and individual level of the actors involved in managing and enacting change at various levels.

The evaluation was performed through a structured enquiry that was not a simple question and answer process. It was more to be considered an attempt to build up a dossier of knowledge about that initiative, at its current state of play in order to draw inferences about current status and prospects for the future and to drive recommendations for the next possible steps.

The structured enquiry carried out at the airport by the researchers and the main actors involved in the initiative identified the following recommendations:

1. The strategy requires a radical improvement in business performance.
2. Management should promote better communication and employee involvement about company goals.
3. The safety management system and the performance management within it need further development/ implementation as they are really only at the beginning.
4. Higher productivity can be easily quantified, but improved services, quality and reliability are currently not well defined and measurable. Therefore, a further effort in the measurement of performance is to be prompted.

6 Conclusions and roadmap to future developments

The airport is now facing the challenge of implementing a safety management system (SMS) for existing and planned operations able to meet the main ICAO requirements (2009) and therefore to ensure continuity of licensing with the civil aviation authority in Italy. To do so, the SMS has to cover the followings areas:

• The need for proactive actions and safety assurances;
• Performance evaluations, review of safety assurance documents, audit reports and compliance with instructions, specifications and regulations.

The capacity to implement change is part of the necessary skills required to manage safety in an organization. Therefore also the tools used for safety evaluation and appraisal need to be more sensitive towards the aspects that are relevant for organizational change. For example: a checklist approach to auditing safety management system implementation may not be sensitive enough to monitor the embedding of safe rules and practices in normal operational activity. Just as the safety case methodology requires a justification of how identified risks are to be managed, an organizational audit has to address the actual functioning of the system that is presumed to deliver a reduction of risk.

The new reporting framework introduced within the context of the new project (MASCA) for this change initiative has the advantage of being embedded in the forms that are already used as part of the normal daily operations for all the operators on site.

This advantage should help providing a real-time picture of routine operations supporting performance management and predictive risk management; further, the new tool should seamlessly integrate in a common pipeline the treatment of all follow-up action required avoiding the problem of storing valuable data gathered about the operation in different formats and by different and often

disjointed departments. This should make it easy to obtain an integrated risk registry.

These data have the potential to identify latent hazards in plant, equipment and procedures that may otherwise go unnoticed and will also provide leverage on the everyday performance management much needed within the context of the business management of the company in the long-term strategy of growth pursued.

The elements introduced for performance management within the company should provide a much more firm ground to change the organization and help it achieve the challenges it is currently facing. A second target and most important objective is to develop a proactive attitude toward safety assessment and assurance. Previous research confirmed the importance of system change as a key precursor of culture change, specifically the change aimed at introducing effective organizational processes able to deliver beneficial outcomes to key stakeholders (Ward & Gaynor 2009). Long-lasting implications are the achievement of improvement and leverage on the everyday performance much needed within the context of the business for the company in the long-term strategy and growth pursued.

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