Airports of the future – incident response planning in Australian airports

Paul Barnes outlines the main goals of a new four-year project to help understand how incident response as an integral part of BCM can be applied to modern airports

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irports are typical examples of large and complex infrastructure systems. They serve a purpose of not only transporting people around the globe but are central to trade and commerce and, in a nation as large as Australia, an important means to connect people and regions. Reducing uncertainty and managing risk in such systems are not only critical tasks integral to effective management practice but equally important for border protection and national security outcomes. This latter issue has been emphasised on a national level in Australia with a number of recent enquiries taking place, most notably the Wheeler Review \(^1\) into aviation security in 2005 and the 2009 National Aviation Policy White Paper \(^2\) on the future of aviation in Australia.

Following the 2005 review, the Australian government implemented a range of new aviation security requirements resulting in major restructuring and enhancements to security practices and infrastructure by all Australian airports. These variations, in particular, related to passenger movement, operations (both air and landside) as well as cargo movements. Practices supportive of these requirements included attention to security measures with specific reference to communications, policing and crime management, surveillance, background checking and identity confirmation for employees, access control, cargo screening and other legislative compliance factors. While such factors are recognised aspects of security risk management the degree of integration of these elements into existing corporate governance and business practices in airports is critical to an assurance of required outcomes into the longer term.

An operational imperative

The maintenance of functional reliability at airports, and wider aviation networks, is a significant operational goal. Airports form a network of commercial value creation extending beyond regional economic activity to deliver important benefits to national economies. In the context of these wide-ranging issues it is imperative that airports have an operational capability and capacity to recover from losses in functionality and the means to continue service delivery, albeit at a lower level, when affected by significant disruptions, ranging from the mundane to the unexpected or extraordinary.

A targeted research effort currently under way in Australia seeks to better understand how incident response planning, as an integral part of continuity management, can be applied to modern airports and aid a rapid return to ‘normal’ capacity following significant service dysfunction. Begun in 2010 this work is part of a larger four-year collaborative research project called “Airports of the Future.” This project is co-funded by the Australian Research Council (Linkage Scheme LP0990135) the Queensland University of Technology and over 30 industry, government and university-based participants. The Australian
partners include seven international and eight regional airports, border security agencies including the Australian Federal Police, the national transport security regulator and numerous aviation industry groups. International links include the International Air Transport Association (IATA), and the Massachusetts Institute of Technology. Three airlines Qantas, Emirates and Virgin Airlines are also affiliated with the work.

The larger project aims to explore opportunities to enhance the capabilities of airport operators to design and manage complex airport systems. Through an integrated and multi-disciplinary approach, the project also seeks to inform proactive ways of managing the often-conflicting tasks of maintaining airport and passenger security while sustaining passenger facilitation throughout an airport. The project comprises seven targeted research areas:

1. Complex systems: modelling complex interactions within airport systems, monitoring performance, and using of related information to aid decision-making;
2. Business process management: visualisation and optimisation of transactional processes within the airport environment;
3. Human systems: enhancing knowledge of how passengers interact with airport systems and use terminal space to inform new system design and enhance operational knowledge;
4. Identity management: managing access control and identity issues as well as other factors in a wider ICT security context;
5. Airport information modelling: enhancing visualisation of and interaction with a range of airport as-built systems for use in strategic decision-making;
6. Intelligent surveillance: the better utilisation of multi-camera networks to improve security outcomes and provision of operational security awareness in airports, incorporating use of a range of innovative biometric identifiers; and
7. Business continuity and incident response management: defining strategic approaches to continuity of operations (via continuity management) and via integration with other relevant programmes, enhancement of incident response capabilities.

Incident response issues

Central to the thinking behind the design of the continuity management (CM) research programme is the importance of understanding the command, control, coordination, communication, and information (C4i) requirements needed for the normal functioning of the complex services provided within a modern airport and the support systems that these services depend upon. Equally important, possibly more so, are the C4i needs within an airport during crises; in particular the circumstances and contexts in which expected functioning ‘transitions’ from normality to crisis. A core focus of the incident response studies detailed here is on this transition from normal operations.

The full scale of consequences from incidents in such complex settings is often difficult to anticipate. Further, because of the potential for the rapid flow of impacts throughout the many public and private spaces of an airport, management may be unlikely to face single incidents but rather a series of incidents within and across functional areas: often appearing concurrently. The potential for this type of cascading effect may lead to decisions to evacuate parts or all of an airport. If both land and airside spaces in an airport are involved, the consequences of escalation of a response to such a level will be significant.

In such circumstances, a rapid recovery of control into the hands of airport management is critical. Thus a further focus of the CM research effort is the documentation and mapping of needs, assumptions and interdependencies of an idealised incident response management capability and capacity across selected partner airports. Of particular interest in this section of the research is the optimal design of scalable incident response and coordination capabilities triggered by the recognition of unexpected events and situations within an airport carried out in collaboration with airport management, first response and regulatory agencies.

It is assumed that a viable ‘scalable’ incident response capability will require detailed alignment with outputs from the other six research programmes currently under way within the Airports of the Future project. This alignment is especially important with the airport information modeling, complex systems analysis and intelligent surveillance programmes.

Key questions

As a broader issue the current research examines impediments to effective implementation of risk, contingency and recovery planning at participating airports and is seeking to identify options for implementing new processes or adapting existing onsite capacities: thus ensuring enhanced operational resilience. The continuity management and incident response (CM/IR) programme will seek to define protocols for integrating incident response and related decision-support mechanisms triggered by the early recognition of a range of unexpected and undesirable events either outside terminals or across the land and airside spaces. The net result of this will be means to better coordinate response, evacuation and recovery protocols across aviation industry and external emergency response agencies.

While not complete, the following outputs are expected from the CM/IR programme:

- Specification of the incident response and management needs and assumptions of airport management, first response and regulatory agencies;
- Mapping assumptions and interdependencies of idealised incident response capability and capacity;
- Detailed specification of end-user requirements for emergency response and business continuity needs aligned with the transport security plans;
- Detailed identification of assumptions among airport stakeholders about response and recovery roles, including responsibility for activating, implementing, standing down and recovering from emergency responses.

Even though research efforts have only recently begun across all programmes, government and industry participants have already benefited from a number of insights derived from initial work. Early adoption of such findings is likely to continue as the work unfolds.

For further information regarding the Airports of the Future project go to: www.airports.ofthefuture.qut.edu.au


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