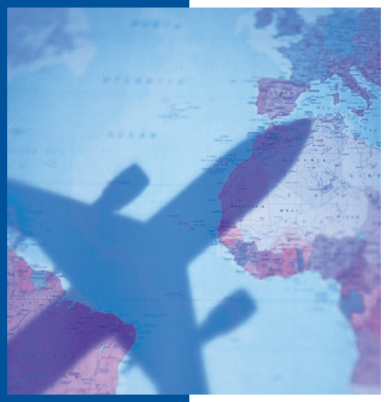

# Management Plan

# Safety Management System for Kona International Airport At Keahole

Submitted to:

**State of Hawaii**
**Department of Transportation**
**Airports Division**

Submitted by:

**Jacobs Consultancy Canada Inc.**
220 Laurier Ave., West, Suite 500
Ottawa, Ontario, Canada K1P 5Z9

**Final - January 2009**

JACOBS Consultancy
*Aviation Solutions*

# Management Plan

# Safety Management System for Kona International Airport at Keahole

**Table of Contents**



**List of Appendices**

# I. INTRODUCTION

The SMS Manual provides details regarding the organization, policies, systems and procedures for the Safety Management System (SMS) at the Kona International Airport at Keahole (KOA). With all such systems, a rational step-wise approach to implementation is required so that the system is introduced in a fashion that will be synchronized with other operations and will allow for the change in culture required for its successful implementation.

It is suggested that the following strategy be utilized to implement the SMS. It is subject to amendment as required and certain activities may be accelerated or delayed as conditions warrant. The overall objective, however, is to implement and have a full SMS at KOA in place within one year.

This Management Plan is specific to Kona. The Division should consider developing separate SMS Manuals and Management Plans for other airports. It would then be appropriate to staff the position of the SMS Safety Advisor at the Division as described in the SMS Manual.

# II. SAFETY ORGANIZATION

The Airports Administrator should endorse the KOA SMS Manual and its implementation at KOA. Once the Airports Administrator provides this endorsement, the Airports District Manager (ADM) at KOA should confirm the safety organization structure and responsibilities detailed in the SMS Manual.

A major key to success of implementing the SMS at KOA will be the new position of the SMS Safety Officer. The ADM will need to staff this position following H-DOTA's personnel policies (e.g.; preparation of a job description, classification of the position[1], hiring competition and selection). A draft job description is provided in Appendix A but will need to be modified to meet HDOT-A staffing practices.

Once in place, the SMS Safety Officer will likely require SMS training during the first year to improve his or her skills in Safety Management Systems, particularly Safety Risk Management. The SMS Safety Officer should take this specialized training where this is available and applicable to airport situations; for example, SMS courses offered by Mitre Corporation or ICAO.

# III. AIRPORT SAFETY COMMITTEE

The establishment and operation of the Airport Safety Committee (ASC) does not need to wait for staffing the position of the KOA SMS Safety Officer. The Airports District Manager (ADM) can start to implement this committee immediately upon endorsement of the SMS by the Airports Administrator.
At KOA, there is an Airport Operators Committee (AOC) that meets monthly and includes many of the same members as the ASC. The members of this committee should meet at least quarterly to deal solely with safety issues as described in the SMS Manual and should be designed the ASC for that purpose. It is anticipated that the FAA will periodically review the minutes of the ASC as part of its role in ensuring effective implementation of the SMS. The ASC may meet more regularly if warranted and called for by any one member.

---

1 *To ensure that assessment procedures used are valid and fair to all protected groups task analyses, assessment procedures, and evaluations must meet specific criteria as defined by the federal and state statues. These parameters must with the Americans with Disability Act of 1990, Civil Rights Act of 1964 and 1991, Uniform Guidelines on Employee Selection, 1978) and requirements governed by OPM (Title 5, CFR-Chapter 339). In addition, the Human Rights agency within the State of Hawaii has rules and regulations that govern employment policies*

To implement the ASC, the ADM should send out a letter to the organizations that will be participating in the new ASC outlining the role of the Committee and asking for their participation and commitment. At the first meeting of the ASC, the ADM should provide a briefing on KOA's SMS and the role of the Committee. The terms of reference of the ASC should be discussed and, if necessary, revised. The initial meeting should also be used to propose tentative topics for subsequent meeting; for example, specific aviation safety issues that tenants may have. A date for the next meeting should be established.

# IV. SAFETY ASSURANCE

Safety Assurance includes the following key elements:

- Safety Trends Analysis and Safety Performance Monitoring;
- Employee (Non-Punitive) Reporting System;
- Accident Investigation; and
- Record Keeping

## *Safety Trend Analysis and Safety Performance Monitoring*

The SMS Manual details the responsibilities of the SMS Safety Officer in trend analysis and in collecting and monitoring data related to safety objectives. The SMS Safety Officer will need to collect safety information as detailed in the SMS and develop an Excel spreadsheet (or other suitable software) to record and then subsequently analyze the safety information.

## *Employee Reporting System*

The implementation of the SMS employee safety reporting system will require finalizing the design of the Employee Safety Report, distributing the Report to supervisors' offices, setting up an internet reporting for those employees with internet access and wishing to use the internet, and communicating the details of the new employee safety reporting system through Safety Newsletters and Bulletins. KOA supervisors and managers should be briefed on the Employee Safety Reports.

The SMS Safety Officer will need to be ready to respond to any reports including safety risk assessments as outlined in the SMS Manual.

By the end of year one, the SMS Safety Officer should prepare the first annual Safety Report as outlined in the SMS.

## *Accident Investigation*

SMS Safety Officer should investigate all aviation accidents that occur at or near the airport. Other parties such as Air Traffic Control (ATC), National Transportation Safety Board (NTSB) and the FAA Flight Standards Office (FSDO) may have jurisdiction in their areas but the SMS Safety Officer should still investigate the accident on behalf of the airport and HDOT-A to serve their interests. The SMS Safety Officer will have to coordinate the accident and incident investigations with ATC, NTSB and FSDO so not to adversely impact their investigation. The SMS Safety Officer should also meet with other stakeholders such at the air carriers and Air Traffic Control

to establish working protocols for cooperation with each organization in accident investigation and reporting. The establishment of these protocols should be a major topic during an early ASC meeting.

### *Record Keeping*

The SMS Manual details the documents that must be retained under SMS. It is likely that the FAA will audit these documents from time to time to confirm compliance with the SMS. The SMS Safety Officer will need to set up electronic files where appropriate. The electronic files should also be kept in hard copy in secure files. Electronic files should be backed up electronically separately from the computer used by the SMS Safety Officer.

## V. SMS TRAINING

The SMS Safety Officer should develop an SMS Familiarization Module that can be used during new KOA employee training. The familiarization module should take about 1 ½ to 2 hours to deliver. This module would address:

- The need for SMS;
- KOA safety policies and objectives;
- Organization for safety – role and responsibilities;
- Safety risk management – including human and organizational factors;
- Safety assurance; and
- Safety promotion.

The module should include a test to determine the effectiveness of the training provided.

A second SMS training module should cover details of applying the SRM process using work exercises and examples. This detailed module should also address the non-punitive reporting system and policy. A work exercise could be included to determine and resolve potential issues from the perspective of KOA managers and supervisors. This course with work exercises should last about 4 hours. This second course should be given as part of refresher training.

The material for these modules is available from the SMS training sessions that will be delivered by Jacobs Consultancy. The SMS Safety Officer may select to use contracted training consultants and specialists to develop the modules.

## SMS PROMOTION – COMMUNICATIONS

As part of rolling out the SMS, the SMS Safety Officer will be responsible for preparing posters that describe the SMS Safety and the Employee Non-Punitive Reporting Policies as defined in the approved SMS. The posters are to be displayed in prominent and highly visible areas within KOA facilities. The policies will also be posted on the KOA website.

The SMS Safety Officer should also develop initial Safety Newsletters in cooperation with HDOT-A Divisional Communications staff to summarize the SMS and plans for implementation, particularly the Employee Reporting System. Safety Posters should be used to augment and reinforce the Safety Newsletter. Subsequent Newsletters should be focused on specific SMS topics such as safety objectives, annual safety report, summaries of the minutes of the Airport Safety Committee.

# VI. SAFETY RISK MANAGEMENT

The SMS Safety Officer in discussion with the ASC should identify three or four situations or practices that would be subject to a formal Safety Risk Management(SRM) process during the first year of the SMS. Potential applications for the SRM could, for example, include:

- Rough Terrain Outside of the Runway Safety Areas;
- Ramp Congestion;
- Commuter Terminal Operations; and
- Fueling Operations.

Potential safety issues associated with these topics are described in Appendix B. These issues have also been forwarded under a separate letter to the Airports Administrator.

# VII. SUMMARY AND IMPLEMENTATION SCHEDULE

Exhibit VII-1 summarizes the implementation strategy, prime responsibility and potential timing for the SMS at KOA.

| Action Items | Prime Responsibility | Timing |
|---|---|---|
| **1. SMS Manual and Implementation Plan** | | |
| 1.1 Approve SMS Manual for Implementation at KOA | Airports Administrator | Month 1 |
| **2. Safety Organization** | | |
| 2.1 Confirm KOA safety organization and responsibilities | Airports District Manager (ADM) | Month 1 |
| 2.2 Staff new KOA SMS Safety Officer position<br>o Job description, position classification, hiring competition and employee selection | ADM with assistance of the Division | Months 2 - 4 |
| 2.3 SMS Safety Officer starts work | | Month 5 |
| 2.4 Train New SMS Safety Officer in SMS | KOA SMS Safety Officer | When available |
| **3. Airport Safety Committee (ASC)** | | |
| 3.1 Prepare and distribute letter establishing new Committee | ADM | Month 2 |
| 3.2 Hold initial meeting (review and revise terms of reference, identify topics for future ASC meetings) | ADM | Month 2 |
| 3.3 Subsequent meetings | | At least quarterly |
| **4. Safety Assurance** | | |
| 4.1 Trend Analysis: Start collecting baseline aviation safety data related to SMS safety objectives | SMS Safety Officer | Month 5 |
| 4.2 Trend Analysis: Develop Excel Spreadsheet for conducting trend analysis | SMS Safety Officer | Month 5 |
| 4.3 Record Keeping: Set-up filing system (All electronic files should be backed up electronically and with hard copy) | SMS Safety Officer | Month 5 |
| 4.4 Employee Reporting: Finalize Design of Employee Reporting Forms | SMS Safety Officer | Month 6 |
| 4.5 Employee Reporting: Roll-out Employee | SMS Safety Officer | Month 7 |

| | | |
|---|---|---|
| Reporting System<br>• Provide information sessions on system to KOA employees<br>• Distribute forms<br>• Communicate new reporting systems via newsletters and posters<br>• Start collecting and analyzing reports | | |
| 4.6 Establish protocols for conducting accident investigations | SMS Safety Officer | Month 8 |
| 4.7 Conduct trend analysis of the first year of safety data | SMS Safety Officer | Month 12 |
| 4.8 Prepare first Annual SMS Safety Report | | Month 12 |
| 4.9 Revise Annual Safety Objectives | | Month 12 |
| **5. SMS Training** | | |
| 5.1 Develop and deliver SMS Familiarization | SMS Safety Officer | Month 7 |
| 5.2 Develop and deliver Detailed SMS Module as part of refresher training | SMS Safety Officer | Start in Months 8 & 9 |
| **6. Safety Communications** | | |
| 6.1 Prepare and distribute posters on SMS Policies | | Month 7 |
| 6.2 Prepare and distribute Newsletter and Posters announcing SMS and Employee Safety Reporting | | Month 7 |
| 6.3 Plan Safety Communications Program for the Second Year | | Month 12 |
| **7. Safety Risk Management (SRM)** | | |
| 7.1 Identify 3 situations to apply SRM | | Month 9 |
| 7.2 Conduct SRM for each situation | | One every two months |

**Exhibit VII-1. Summary Implementation Strategy**

# APPENDIX A

# SAMPLE JOB DESCRIPTION FOR THE SMS SAFETY OFFICER

## 1. OVERALL PURPOSE

The SMS Safety Officer is responsible for providing guidance and direction for the planning, implementation and operation of the airport Safety Management System (SMS).

## 2. KEY ROLES

### *Safety Advocate*

Demonstrates excellent safety behavior and attitude, follows regulatory practices and rules, recognizes and reports hazards and promotes effective safety reporting.

### *Leader*

Promotes an organizational culture that fosters safety practices through effective leadership.

### *Communicator*

Acts as an information conduit to bring safety issues to the attention of management and to deliver safety information to airport staff, contractors and stakeholders.

Provides and articulates information regarding safety issues within the airport.

### *Developer*

Assists in the continuous improvement of the hazard identification and safety risk assessment schemes and the airport's SMS.

### *Relationship builder*

Builds and maintains an excellent working relationship with the Airport Safety Committee (ASC), airport employees, airport tenants and contractors

### *Analyst*

Analyzes technical data related to hazards, events and occurrences for trends.

### *Process Management*

Effectively utilizes applicable processes and procedures to complete roles and responsibilities, Investigates opportunities to increase process efficiency and measures the effectiveness and seeks to continually improve the quality of processes.

## 3. SPECIFIC RESPONSIBILITIES

The specific responsibilities of the SMS Safety Officer include:

1. Participating in the Airport Safety Committee, as the Secretariat;
2. In consultation with other KOA managers, develops and proposes annual safety objectives for approval by the Airports District Manager;
3. Measuring safety performance in relation to safety objectives;
4. Taking the lead role in safety risk management assessments of hazards, incidents and accidents to determine action required;
5. Conducting trend analysis of safety concerns, hazards, incidents and accidents and determining action required, in consultation with other airport staff;
6. Ensuring appropriate action is taken in response to safety concerns, hazards, incidents and accidents;
7. Keeping records of all safety related reports, incidents and accidents, and conducting trend analysis;
8. Providing and coordinating safety promotion;
9. Ensuring the provision of safety training for airport employees and tenants located or working in the AOA;
10. Implementing a non-punitive reporting system;
11. Ensuring that safety audits are conducted when required; and
12. Annual review of the safety policy and safety objectives.

## 4. SKILLS

1. The position requires the ability to cope with changing circumstances and situations with little supervision. The SMS Safety Officer acts independently of other managers within the organization.
2. The SMS Safety Officer is responsible for providing information and advice to senior management and to the Airports District Manager on matters relating to safe operations. Tact, diplomacy and a high degree of integrity are prerequisites.
3. The job requires flexibility as assignments may be undertaken with little or no notice and outside normal work hours.
4. The SMS Safety Officer must interact with operational personnel, senior managers and departmental heads throughout the organization. The safety manager should also foster positive relationships with regulatory authorities, agencies and service providers outside the organization. Other contacts will be established at a working level as appropriate.

## 5. QUALIFICATIONS

The attributes and qualifications include:

1. Broad operational knowledge and experience in the functions of the airport (e.g. training, aircraft operations, air traffic control, aerodrome operations and maintenance;
2. Sound knowledge of safety management principles and practices;
3. Good written and verbal communication skills;
4. Well-developed interpersonal skills;
5. Computer literacy;
6. The ability to relate to all levels, both inside and outside the organization;
7. Organizational ability;
8. Capable of working unsupervised;
9. Good analytical skills;
10. Leadership skills and an authoritative approach; and
11. Worthy of respect among peers and management.

## 6. AUTHORITY

1. Regarding safety matters, the SMS Safety Officer has direct access to the Airports District Manager.
2. The SMS Safety Officer is authorized to conduct safety audits, surveys and inspections of any aspect of the operation of the airport.
3. The SMS Safety Officer has the authority to conduct investigations on internal safety events in accordance with the procedures specified in the Safety Management Systems Manual.

# APPENDIX B

# SAFETY ISSUES IDENTIFIED DURING THE DEVELOPMENT OF THE SMS

Several issues were identified during the development of the SMS Manual that could have the potential to impact the safety of passengers, airport employees or damage equipment at KOA. These include:

- Rough Terrain Outside of the Runway Safety Areas;
- Ramp Congestion;
- Commuter Terminal Operations; and
- Fueling Operations.

## Rough Terrain Outside of the Runway Safety Areas

Runway Safety Areas (RSAs) are an important part of the runway environment at an airport and help to reduce the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. Part 139.309 requires a runway safety area (RSA) of 250 feet each side of the center line of the runway and 1000 feet at the end of the runway at KOA. This RSA is to be clear of all obstacles. KOA meets FAA criteria for dimensions and surface conditions.

However, there is a concern regarding the rough terrain due to the lava field on which KOA is built. The majority of airports have graded areas beyond the RSA dimensions because the land is not cost prohibitive to develop. This reduces the risks and enhances the ability for emergency response should an aircraft go beyond the RSA. KOA is unique in that it is located in the middle of a lava field. The initial construction of the airport included escalating costs due to the geology of the land to be developed. Only those areas that had grading requirements were addressed.

KOA has a higher risk, compared with most other airports, in providing emergency response to an incident should an aircraft exit or crash beyond the RSA. Emergency vehicles and personnel cannot operate on most of the lava field outside of the RSA at KOA and therefore could not easily assist in an aircraft crash outside of the RSA.

From a safety risk management perspective, the probability of an aircraft crashing on the runway or the RSA is remote. The probability of an aircraft exiting or crashing beyond the RSA is even more remote. Yet the consequences could be catastrophic. A Piper PA-30 Twin Comanche recently veered off the runway approximately 60 feet into the lava field and sustained considerable damage. Fortunately no one was hurt. A similar situation with a large commercial passenger aircraft would likely be more calamitous.

### *Recommendations*

KOA and HDOT-A should conduct a comprehensive cost and risk assessment to determine if some of the areas outside of the RSA should be graded to remove obstacles. Due to the expected high capital costs, this study should include a numerical estimate of the actual risk in quantitative terms in order to do a rigorous cost-benefit analysis. The actual risk should be based on historical accident and incident records of aircraft crashing on, or ending up outside, the RSA. The study should also consider the number times that aircraft at KOA use the 17-35 runway during cross wind conditions due to the lack of a cross-wind runway. Accident and incident reports are available from the FAA and world wide sources. The study should also address the areas and associated dimensions that should be graded to remove lava flow obstacles and what the costs would be. The results of the analysis should be used to set priorities for any corrective action in comparison with other capital works at KOA.

## Ramp Congestion

KOA was constructed to serve inter-island aviation passenger traffic when passenger numbers were less and the aircraft being used on these routes were smaller. Due to the growing local economy and tourist activities, KOA passenger volumes has grown and has attracted air carriers from the mainland and Japan. The size of aircraft has also increased with U.S. flag carriers using aircraft as large as B-767's and B-757's and Japan Airlines flying a B-777. The configuration of the airport terminal buildings and ramp has lead to congestion as KOA has accommodated the air carriers.

Activity on the ramp can be intense with large numbers of ground service vehicles, 10,000 gallon fueling trucks and airline vehicles and employees performing airline operations. Through these activities passengers must enplane and deplane by walking across the ramp to and from the aircraft. Passengers are marshaled by employees of a contract security agency and airlines between the terminal and aircraft. Passengers must use hard stands as jet bridges are currently not available.

Safety concerns identified include:

- **Push-back:** The ramp is an uncontrolled movement area. Departing aircraft are pushed back away from the terminal by the airline where the aircraft powers up and departs to a taxiway. Aircraft power-in when arriving. Jet blast from these airplanes has the potential for damaging equipment and injuring persons on the ramp. It has been suggested that lines be painted to show where aircraft should be parked. This way the carrier could position their ground equipment to service the aircraft. Kona's problem is that in painting "the box", KOA would have to have "the box" for the largest aircraft that would likely be at that gate and this means that KOA would likely loose gate positions.

- Equipment operating near and around surrounding aircraft have the potential of striking other aircraft, equipment, employees and passengers in these tight spaces;

- Lack of marked vehicle lanes does not direct the movement of ground vehicles potentially causing damage or injury;

- Ground equipment owned and operated by the airlines or their sub-contractors has been leaking oil and hydraulic fluid on to the ramp. This has the potential of causing accidents and injuries. Some of equipment owners have not properly cleaned the spills or repaired the equipment causing on going spills. Bradley Pacific Aviation, who provides fuel for the air carriers, does not have building on airport to repair its vehicles and maintains them on the ramp which leads to spills.

### *Recommendations*

KOA and HDOT-A should consider developing an Administrative Rule similar to Administrative Rules governing airport vehicle operations but applying to push-back procedures, and ground support equipment operation and maintenance. KOA and HDOT-A should further investigate painting line markings for aircraft parking and vehicle lanes.

## Commuter Terminal Operations

Commuter Airlines have been moved to a temporary terminal. This terminal and ramp is located in an area that includes cargo operations, helicopter tour and flight school operations and fueling operations. The temporary terminal is planned to be replaced in the near future to better handle passengers and airline tenants.

Safety issues identified in this area include:

- Inadequate ramp lighting in the commuter terminal area that may lead to damage to aircraft or vehicles, or injury to passengers and employees. There was a recent accident in this area where a commuter aircraft struck a light pole while attempting to maneuver in this constrained area;

- The fueling operations are located near the commuter operations. The movement of aircraft, fuel trucks and passengers in this confined area and the lack of lighting is a potential hazard;
- Tour helicopter operations and flight school operations are located adjacent to the commuter ramp. Several individuals expressed concern with the flight school and student pilots learning how to fly helicopters operating in this area. Concerns included the flight path used and skill level of the new pilots using the adjacent ramp; and
- During the holiday season general aviation increases and all available parking is used to handle the number of aircraft including Taxiway B. This adds congestion to the activities already being conducted in this part of the airport. DOTA has identified an area for General Aviation (GA) expansion to assist in reducing this risk.

### *Recommendations*

KOA should conduct a more detailed Safety Risk Management assessment as detailed in the SMS Manual to further elaborate and categorize safety risk, and then prepare specific safety action plans.

## Fueling Operations

KOA has a lack of fuel storage capacity both on and near the airport. There is a small fuel farm (90,000 gallons jet A) located on the airport that includes a self serve Av Gas tank. This has lead to tanker trucks driving from Hilo to KOA to meet the Jet A fuel requirements at KOA. Fixed Based Operators (FBO's) use 10,000 gallon fueling trucks to help off set the lack of fuel shortage on the airport. The FBO's do not have facilities to house their vehicles and maintain them on the ramp as mentioned previously.

Safety issues identified include:

- The large vehicles add to the congestion on the ramp. They must maneuver around aircraft, other ground vehicles, airline personnel and passengers;
- With the constant transfer of fuel there is concern that the fuel does not have the opportunity to settle long enough causing a potential for catastrophic events;
- As mentioned above, the aircraft refueling vehicles must be maintained on the ramp. This has lead to oil leaks causing the potential for safety related issues; and
- ARFF personnel at KOA lack the appropriate equipment and training to conduct safety inspections of fueling vehicles, equipment and operations.

### *Recommendations*

KOA should conduct more a detailed Safety Risk Management assessment as detailed in the SMS Manual to further elaborate and categorize safety risk, and then prepare specific safety action plans.